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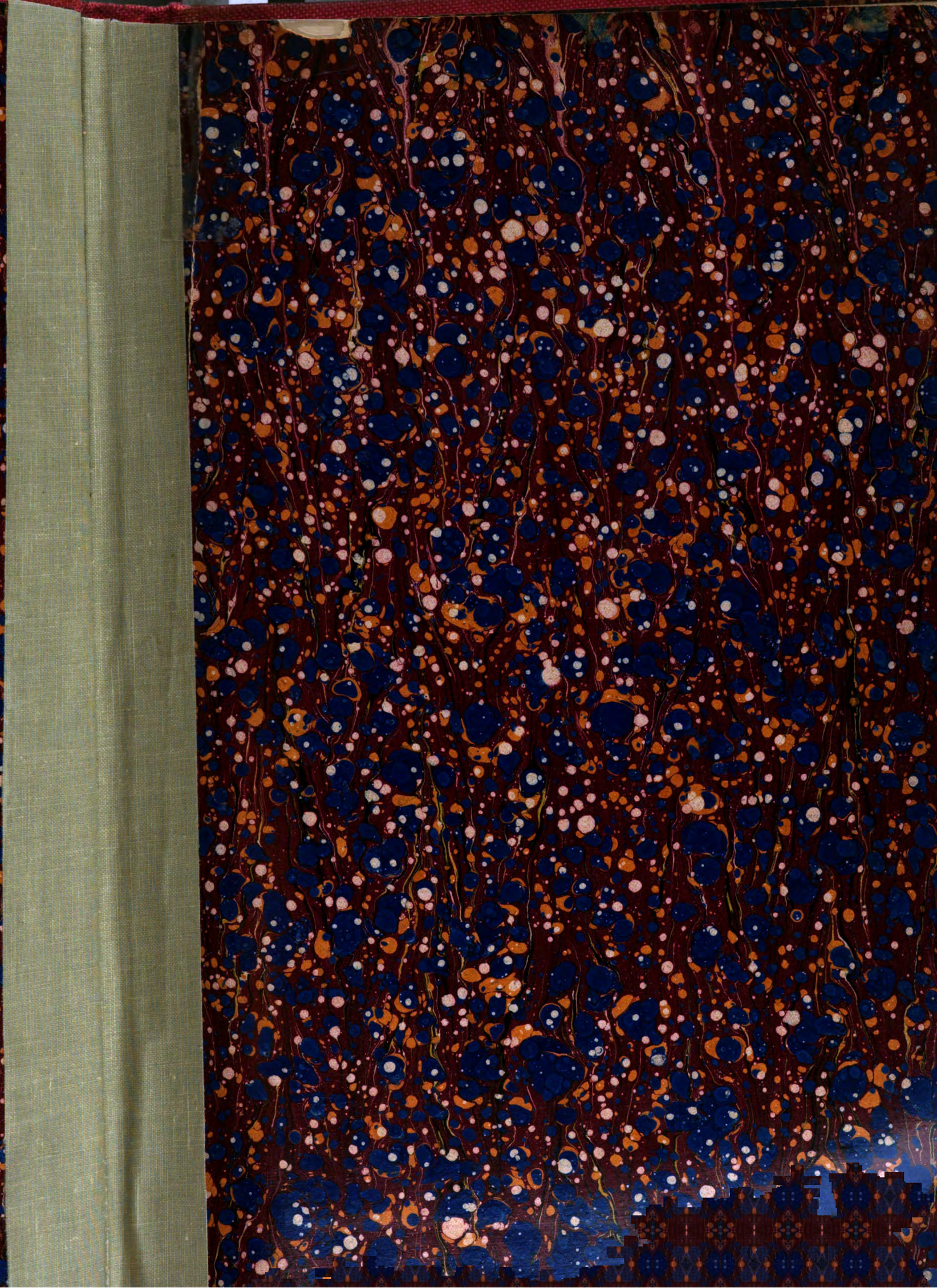

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VOLUME LXXXI

JULY TO DECEMBER 1901

THE BUILDER

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CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

"EVERY man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kind of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

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THE BUILDER

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The Genius of Inigo Jones.

THERE is a strange contrast between the conviction we feel as to the genius of Inigo Jones and the comparatively small basis of accomplished work which can be cited to justify this conviction. There is a certain analogy in this respect between his position and that of Leonardo da Vinci. No one can doubt that da Vinci was one of the greatest artistic intellects of the Italian Renaissance; yet his fame practically rests on only one work of the highest importance, now unhappily nearly faded away; on a few smaller paintings some of which are of doubtful authenticity; and a number of miscellaneous sketches and studies, full of a marked and almost defiant originality, though of the most mixed and fragmentary character. Inigo Jones has also his one great work, but with the unfortunate difference that it exists only as a scheme on paper and not as an executed work. What the "Last Supper" is to da Vinci's fame, however, the design for the Whitehall Palace is to Inigo Jones's; it is the one architectural conception on a great scale which can be positively affirmed to be his; and with the exception of the one corner of it which has taken shape and substance in masonry, it has to be judged entirely by a set of rough and inadequate drawings. Yet these alone are enough to prove that Jones was one of the world's great architects, one of those who had the power to conceive and plan a great building which should be a stately and impressive whole, embodying a grand idea; not a mere picturesque collocation of parts with no necessary relation to each other. And considering how much we have heard lately in contempt of architectural drawing and designing, and that an architect is a man who builds and not one who makes drawings, and so on, it is rather significant that the fame of our greatest architect—for such Inigo Jones potentially must be held to be—rests more than anything else on a design of which only a small fragment ever got beyond the stage of drawings.

As far as the drawings go, it is mainly in the plan that Inigo Jones's genius is manifest, partly because the drawings of the elevations, like other drawings by him (or attributed to him) and by other architects of the period, give but an inadequate idea of the manner in which the detail would have been carried out, and partly because the greatness of the whole conception resides more in the plan than in what is sometimes mistakenly called the "architectural treatment," as if that were something separate from plan. Inigo Jones had strongly imbibed the lessons of the Classic school of architecture, and regarded a large building as a thing to be grouped in symmetrically designed masses arising out of the main divisions of the plan, not as an opportunity for seeking adventitious effect by the aid of unexpected and picturesque features unconnected with the main design of the plan. Consequently, there is nothing startlingly original in the suggested detail; it exhibits the usual materials of Classic architecture of the Renaissance—rustication, orders, architraves and cornices to the windows, &c. For the architectural effect we should have had to look, had it been completed, to the masses, to the balance and symmetry and to the great scale of the whole, not to anything especially original in the design of the details; though the Banqueting House suffices to show with what refinement and scholarly feeling these would have been worked out. Still, architectural invention is not specially displayed here. The invention is in Jones's magnificent plan, the finest plan for a royal palace, perhaps, ever made; at all events the finest of which we have any record. The two most striking points in it, besides the immense scale of the central court (which must have been impressive, one may almost say, whatever were the details), are first, the fine contrast between the square state court on the one side of the great quadrangle and the circular court on the other side; the two occupying a symmetrical position on the axis of the plan, so as not to disturb the stately effect of the quadrangle, yet offering such a piquant contrast in architectural line and effect; and secondly, the mere idea of using a great circular gallery as the State approach to the Royal apartments. It is possible that many who know the plan in a general way have not fully realised this feature, and the effect which it would have had in execution. No such approach to the presence of Royalty has ever been devised in any palace of which the plan is preserved. The entry is first into a large square hall with four columns in the centre, dividing the area into nine squares, as it were;

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then up one or other of the great staircases on either side, landing in a similar hall on the first floor; thence access would be had to the great circular gallery, round the whole semi-circle of which the visitor must proceed to the opposite portal, whence he would have emerged into a long and wide gallery which formed the ante-room to the two "Royal closets," rooms of oval shape, susceptible of very fine decorative treatment, entered through doors near each end of the gallery. Architecturally these private rooms of the Sovereign are decisively emphasised in the exterior design, the blocks in which they were situated forming decorative projections from the front, crowned with cupolas. To have kept up a suite of royal galleries and approaches on such a scale would have been as much beyond the purse of an English sovereign of the period as would have been the erection of the palace to begin with; and if Charles I. had got together the money to build the palace, he would never have been able to occupy it with a state and splendour in keeping with the spaciousness and dignity of the plan. But one can imagine, under such a monarchy as that of Louis XIV., for instance, what a scope such a plan as this would have afforded for the display of a sumptuous retinue, what opportunities for processions and other attributes of state in royal receptions. It was truly a great conception. Versailles is but a piece of commonplace compared with what Inigo Jones's palace would have been.

The British Museum print-room contains a portfolio of plans and elevations of the palace, mostly on tracings mounted, some of which are claimed as being Inigo Jones's own drawings. Mr. Blomfield doubts whether there are any drawings of the palace which can with certainty be said to be from the hand of Jones himself; he takes the Worcester College drawings for illustration of the design. It is quite certain, however, that some of the British Museum drawings are more like originals than others; at least there are obvious copies which reflect a kind of *per contra* authenticity on the others. In those which are classified as genuine at the Museum, there is a freedom in the sketching in of the sculpture which is in their favour; and there is one decorative detail, that of scrolls or consoles with a head placed on the scroll, which occurs in two or three places, and is so much of the nature of an Italian Renaissance fancy as to give the impression of coming from a draughtsman who had studied Italian work at first hand. There is a considerable use of decorative sculpture in the shape of nude figures lightly sketched in to fill up spandrels, in a manner which looks more like original work than like a copy. Along with these is an elevation for the north front of the Palace, with this inscription at the foot:—

"The incomparable architect Inigo Jones having in the year 1639 presented those his Designs for the Building of White Hall to King Charles ye First: which through ye Iniquity of ye Times could not be put in Execution. It has unfortunately happened yt (as one Evil is often the Cause of more) that ye North Front of this Design having been lost —— I have to ye best of my Judgment Erected this Front, from ye Original Plan of Mr. Jones, in his stile, to make ye Designs Compleat. Wm. Emmett of Bromley in ye County of Kent: Ano 1717."

The worthy Mr. Emmett has, however, hardly given probability to his design by adopting, in the recessed portion of the elevation, a long row of round-arched windows in the upper story, similar to those introduced in the centre of the pavilions in the elevations which claim to be original. Considering the general symmetry which prevails throughout the design as shown in the latter, it is not likely that Jones would have materially varied the north front by introducing as a repeating feature a form of window which in the other elevations is only used as accentuating the design in the pavilions. There are other elevations in the British Museum portfolio much neater in execution than the so-called originals, though at the same time tamer and more timid, and which are obviously a draughtsman's copies. In these drawings the form and finish of the cupolas differs from that given in the Worcester College drawings and followed by Kent, and is on the whole superior to the latter. If we are to suppose that there are any drawings of the Whitehall elevations by Jones's own hand extant, we should be disposed to think that there is considerable internal evidence in favour of those claimed as original in the British Museum set. They have not the finish and care, nor the timidity, of a draughtsman's copies; there is a freedom about them which suggests the hand of the original designer. In the same portfolio is a set of elevations of a long façade of a classical building of somewhat the same proportions as the Whitehall Palace; a design with a large Corinthian order and two stories of windows between; the whole of a very *rococo* character and profusely ornamented with scrolls and masses of carved festoons, &c. It is evident that these had at one time been regarded by some one as elevations for an alternative design of the Palace, as there is a half-obliterated pencil memorandum on one of them referring to this belief and stating that they are not such, but something else which is illegible. Whoever these are by, there is a great deal of force and vigour about them of an exuberant character, but they are unlike the generally reticent and reserved quality of Jones's designs for buildings, and the terminal figures on the balustrade are clumsily sketched in, and these and the terminal vases are out of scale with the whole. On the other hand, they have some of the character of Jones's sketches for Masque architecture, in which he is a great deal more exuberant and *rococo* than in any of his known designs for permanent architecture. They are of some interest at all events, whether original or not. The British Museum also possesses some free and bold pen studies of figures and heads attributed to Inigo Jones, of which the principal example is much more in the style of Rubens than in that of the Italian masters with whom Inigo Jones should have been more familiar. An interesting sketch is one for some piece of architectural sculpture introduced in panels with plain piers between them; the sculpture is roughly but forcibly sketched in, a figure in each panel, and again with the rounded contours belonging rather to Flemish than Italian art. If these figure studies are genuine, they show that however Inigo Jones had been imbued with the Italian Renaissance taste in regard to architectural detail, his ideas of figure drawing were of a ruder and less refined school.

Apart from his great design for Whitehall Palace, which in its general lines and its magnificent plan is at least authentic (though even here we are left in doubt as to the authenticity of the actual drawings), the work of Inigo Jones in English architecture is represented to us in the present day, in great measure, by scattered fragments of designs; portions of buildings which are probably his but of which much of the original work has disappeared or been altered; a front here, a gateway there, a staircase or a room happily preserved, show the traces of his powerful hand. The impression we get of him is somewhat like that of the last appearance of the wizard in the "Lay of the Last Minstrel":—

> "Some saw an arm, and some a hand,
> And some the waving of a gown."

We have to piece things together to arrive at a conception of his powers. Hence Mr. Inigo Triggs and Mr. H. Tanner have done an admirable and most useful piece of work in collecting together in one volume illustrations of various designs by him which may be considered to be authentic.* Kent, no doubt, has put on record quite a long series of plans and elevations of houses attributed by him to Inigo Jones; but how much of this collection is Kent and how much is Inigo Jones it is not very easy to conclude; a good many of them at all events were probably merely worked up by Kent from rough sketches which had come into his possession. Some of the plans, though unpractical from the point of view of the present day, are fine as suggestions in architectural arrangement; but the elevations for the most part give no impression of that peculiar power and freedom in the handling of the *matériel* of Classic architecture, by which Inigo Jones put his own stamp on everything he carried out. As Mr. Blomfield observes in the chapter on Inigo Jones in his "History of Renaissance Architecture in England," it is probable that a building carried out under the great architect's superintendence took a different character and gave a different impression from anything which even his own drawings would convey. Mr. Triggs and Mr. Tanner have inverted the process; instead of drawings of what Inigo Jones might have carried out and put his own impress on, we have carefully prepared drawings of what he actually or probably did carry out; we proceed not from the drawing to the building, but from the building to the drawing.

The remarkable thing about Inigo Jones's genius is the power which he seemed to possess of putting his own life and vigour and originality into the use of architectural features which in one sense can hardly be called original, seeing that there was Classic precedent for their use, but which became stamped with originality from his bold manner of using them. Unlike Wren, who started as an admirable constructor and an original thinker in the way of plan, and became an artist as it were by degrees and by dint of practice and development, Inigo Jones was a born artist. In architecture he may be compared to Michelangelo in sculpture: on everything he touched he seemed to leave the impress of his powerful hand;

* Some architectural works of Inigo Jones: a series of measured drawings and other illustrations; together with descriptive notes, a biographical sketch, and a list of his authentic works. By H. Inigo Triggs and Henry Tanner, Junr.: Associates of the Royal Institute of British Architects. London: B. T. Batsford; 1901.

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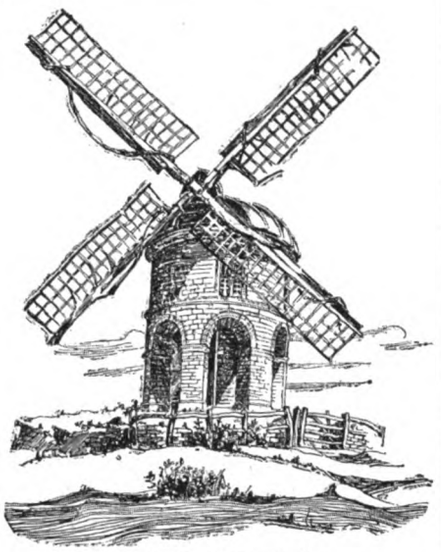
he could do nothing in a weak or commonplace manner. One of the most remarkable instances of this, perhaps, is that which is so familiar to us in Covent Garden church; for though it is difficult to say how much of the original construction, which has twice passed through the fire, is now left,* there can be no doubt that we have the design in its original form; it tells its own story as far as that goes; nowhere else can we find such an impression of power produced by such simple means; it is difficult to analyse in what it is that the effect consists, but the impression is unmistakable. In the treatment of design of a less severe character, again, one cannot but be struck with the remarkable shaping and modelling power possessed by Inigo Jones. The conventional resources of architectural ornament, such as scrolls and festoons, seem to gain a kind of new life under his hand; he seems to have modelled a building as a sculptor models a figure; and in this respect he certainly shows a notable example of that influence of individuality in the architect which some modern critics would persuade us is the bane of the art. Of this power a very good instance is the comparatively simple design of Raynham Hall, a building which we quite agree in regarding as bearing the stamp of authenticity as one of Inigo Jones's designs. There is no detail in this which can be said to represent a new idea for the period, yet there is a marked originality about it as a whole. Regarding this as one of the most interesting of the buildings which are Inigo Jones's design, we have given reduced reproductions of the two detail elevations, both as illustrations to this article and as examples of the class of illustration to be found in the book before us. In the use of that fine source of architectural expression, rustication, which Ruskin so unnecessarily scoffed at, Inigo Jones again shows always a remarkable power; he never uses it in a commonplace manner; a rusticated gate-pier becomes in his hands a work of architectural expression.

Among the works illustrated in the larger plates in the book, the authors have given measured drawings, both general and detail elevations, of the Banqueting House; of Castle Ashby; details from West Woodhay and Kirby; elevations, detail elevation, and elaborate interior details from Wilton House, including also an elevation of the stable buildings; a perspective drawing of Ashburnham House staircase; elevations and details of Coleshill House and Forde Abbey, with photographs of two of the ceilings from the latter; and an elevation and plan of what is perhaps one of the most interesting things in the book, the small garden-house at Beckett Park, a simple but boldly-treated building which proclaims the hand of the master as unmistakably as the front of St. Paul's, Covent Garden. They give also reproductions of the elevations of the Whitehall Palace, which, though never carried out, could hardly be omitted in any book of illustrations of Inigo Jones's work; it is besides necessary to explain properly the design of the Banqueting House; but the plan should also have been given to the same scale, not only to explain the elevations, but because, as already remarked, it is in the plan that the real greatness of the design consists.* The biographical and critical notice is also illustrated by numerous sketches and photographs of great interest. We reproduce, to a reduced size, two of the smaller ones, a shield from Kirby Hall, and the windmill at Chesterton; this is only "traditionally assigned to Inigo Jones," and we should rather question its authenticity; but whoever was the designer, it is an interesting example of an attempt to give architectural effect to a windmill.

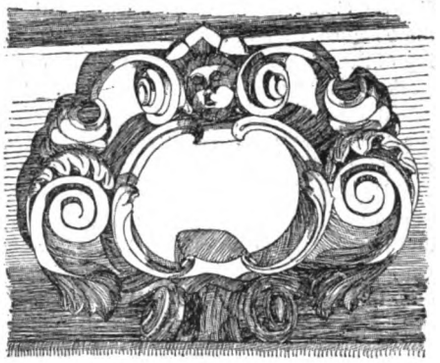


Windmill at Chesterton.

The literary portion of the book is well written, without any attempt at more than giving a summary of the facts of the architect's life, and a brief description of the principal buildings illustrated. The execution of all the drawings is very good, and the make-up of the book does every credit to its well-known publisher.

To Inigo Jones's contemporaries a great part of his popular fame evidently rested on his fertile invention in designing built-up scenery for the elaborate masques which were a favourite form of entertainment of the time; a class of design no doubt most fascinating to a man of architectural genius, allowing him to give full scope to his inventive faculties without being hampered by any practical or economic restrictions. Could we have drawings of all the designs of this kind made by Inigo Jones, we should have probably a new impression of his genius, and a better understanding of the light in which he was regarded by his contemporaries. It would seem that while in the design of actual buildings Inigo Jones leaned towards a classic severity of style, in his masque designs he, not unnaturally, allowed a much more free licence to his fancy. Mr. Blomfield has published one very clever and interesting illustration, apparently from a rather highly finished drawing of somewhat fantastic design. The Institute of Architects' library possesses a few sketches of this kind, one of which, too slight and rough to reproduce from, shows a very fine conception; we seem to see one side of the scene in perspective, with a row of massive projections one after the other, treated some of them with cornices and columns or pilasters, one apparently as a circular tower with a cupola; one can easily imagine that a very fine built-up scene could be made out of this.

While welcoming the publication of the book of illustrations of Inigo Jones's work



A Shield from Kirby Hall.

which has been partly the occasion of these remarks, and which is one that every architectural library should possess, we may add that we hope those who possess or consult it, younger architects especially, will make the right use of it—not in attempts to reproduce Inigo Jones's style, but in endeavouring to catch that spirit of largeness and dignity of design, and power in the treatment of detail, which may be equally exemplified in other styles besides that in which our great architect worked.

NOTES.

Architects' Benevolent Society.

THE Annual Report of the Architects' Benevolent Society gives the result of the special appeal which was made by the President of the Institute to the profession in a circular letter in June last. The result was not very encouraging, amounting to an increase of annual subscriptions to the extent of 98*l.* 9s. 6d., with donations to the amount of 151*l.* 17s. 0d.; the cost of issuing the appeal having been 38*l.* 8s. 8d. A second and less formal appeal made by Mr. Emerson at the last annual meeting of the Society was, however, more successful, and has led to some very liberal donations from Mr. Macvicar Anderson, the late Mr. Brydon, Mr. Emerson himself, Mr. H. L. Florence, Mr. E. E. Grayson, Mr. Gruning, Mr. E. T. Hall, Mr. G. T. Hine, the Liverpool Architectural Society, the Nottingham Architectural Society, Mr. Norman Shaw, Mr. Aston Webb, and others. One cause of the difficulty in obtaining adequate subscriptions is, no doubt, that the architectural profession as a whole is a poor one, and that many do not like sending a subscription of a few shillings only, and do not feel that they can afford more. On the other hand, the number of applications for assistance is increasing. Perhaps the best thing to advise is to suggest to members of the architectural profession that a small assistance is better than none, and that 5s. each from 5,000 persons (the number to whom Mr. Emerson's first special appeal was issued) would have meant 1,250*l.*, instead of the much smaller result named above. But it is quite comprehensible that some people would regard the publication in a subscription-list of so small a sum as a confession of poverty which they do not like to make. But we do urge the profession to take into consideration the important claims of the Architects' Benevolent Society, and make an effort to assist in increasing its resources.

* So also with the front of the Banqueting House, of which it is not generally known that scarcely any of the original facing masonry is left; it has been pieced at different times owing to the decay of the stone, but the work of repair must have been very conscientiously done.

* A small scale illustration of the plan is given in the text of the work.

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The L.C.C. Works Department.

THE half-yearly return of works completed by the Works Department of the London County Council, which was submitted by the Finance Committee at Tuesday's meeting of the Council, shows that most of the works have been carried out at what is called a profit, *i.e.*, at a cost slightly below the final estimate of the architect or engineer. There is reason to think that the Department would always be in this happy position if it dealt only with drainage and jobbing works and refused to undertake works of an architectural character, for the only cases in the present report where the cost has considerably exceeded the final estimate were the Redcross fire-station and Cobham buildings; the excess in these cases being 1,023*l.* and 1,129*l.* respectively. There is no doubt that under the new management the Department is doing better than in the early days of its existence, though it is hinted that there are some works now in hand that may not show "quite such good results" as those just reported. Probably before the best results are obtained, the Department will have to be reorganised and the cost of management, which is said to be excessive, reduced.

Hampstead Heath and the Tube Railway.

THE Hampstead Heath Protection Society have circulated a letter explaining their position in reference to the proposal to drive a tunnel railway under Hampstead Heath. In the course of this they say:—"We are not opposing the construction of the Tube Railway already sanctioned from Charing Cross to Hampstead, nor do we object to an extension of this railway outside the boundaries of the Heath in a northerly direction to Golders' Green. But the Society are very strongly opposing the present proposal to tunnel under the Heath. This proposal they consider to be absolutely wrong in principle. The suggestion that a tunnel under the Heath might be allowed provided no station were made within the precincts of the Heath is plausible but quite unworthy of support. No railway, either under or over the Heath, should be allowed. It should avoid the Heath altogether. The Commons Preservation Society and the National Trust for Places of Historic Interest or Natural Beauty write to us that they quite agree with us in thinking that the right principle is to give access at as many points as possible on the border, but to keep the Heath one undivided whole." We are entirely in agreement with this view.

The Electric Corrosion of Pipes.

THE evidence given by experts before the Select Committee appointed by the House of Commons to report on the London United Tramways Extension Bill was most interesting and instructive. Sir William Preece said that there were always large electric currents flowing through the crust of the earth which had some connexion apparently with sun spots and auroral disturbance. It was suggested that currents measured by the opponents of the Bill might possibly be due to natural causes, and that wherever rails and pipes were laid they might be found. Professors Ayrton and Perry, however, described tests they had made in Clapham-road. In the afternoon when the traffic was slack in the City and South London Electric Railway, the current in the pipe tested was ten amperes, but in the evening about seven o'clock it rose to fourteen amperes. This is an extraordinary result, seeing that there are many other pipes in the same road, and that the electric railway is enclosed in an iron tube 50 ft. below its surface. It was noticed that the pipe was eaten away on the side next the generating station, where the current would naturally leave to get back to the dynamo. We think that this experiment, and some of the others described to the Committee, prove beyond the possibility of a doubt that there are leakage electric currents, in some cases of great magnitude, in the pipes in the neighbourhood of electric tramways which do not use an insulated return. Londoners are to be congratulated that the London County Council, acting on the experience Dr. Kennedy gained by a visit to America, has adopted a system of insulated returns for its tramways. Dr. Silvanus Thompson calculated that a current of one ampere would produce in an iron pipe 15 grains of corrosion per hour, which works out to 14 lbs. a year. This is the maximum possible corrosion it could produce. If the pipe were in a dry conducting soil the corrosion would be much less. The water companies are to be congratulated on the evidence they brought before the Committee; for although their electrolysis clause was rejected, they have proved to unbiassed electricians that even when an electric tramway with uninsulated return satisfies the Board of Trade regulations considerable damage may be done to neighbouring pipes by leakage currents. The question is bound to arise again, and as time goes on the evidence of the damage done will get stronger and stronger. In our opinion also, evidence will soon be forthcoming of damage done by leakage currents from three-wire direct current supply systems.

The Baltic Mercantile and Shipping Exchange.

ON June 25 the Lord Mayor laid the foundation-stone of the buildings which are being erected for this company (formed in March, 1900), at an estimated maximum cost of 175,000*l.*, after the plans and designs of Mr. W. Wimble and Mr. T. H. Smith as joint architects. The site, a freehold area of 28,700 ft. superficial, was purchased from the City of London Exchange Syndicate, and has been cleared by the demolition of Nos. 26-8, St. Mary Axe, Nos. 22-4, Bury-street, and all the houses in Jeffrey's-square, together with the square as well. Some portion of the ground will be appropriated for the widening of Bury-street and St. Mary Axe. The new buildings will occupy 18,515 square feet of the total area, and it is calculated that they will provide ample accommodation for the members, 3,000 in all, of the Baltic Exchange in Threadneedle-street, and the London Shipping Exchange in Billiter-street. The new premises will comprise an exchange 152 ft. long, 94 ft. wide, and 30 ft. high, with a central dome 30 ft. in diameter; a general exchange having a total area of more than 15,000 ft.; reading, club, and arbitration rooms; some four hundred offices, and other accommodation, to yield an estimated net annual rental of 13,700*l.* The former South Sea House (1773-4), in Threadneedle-street, was vacated on September 29, 1900, by the Baltic Society, who, we understand, sold the premises and site for 350,000*l.* to the British Linen Company Bank of Edinburgh for their proposed offices. In 1855-6 the South Sea House was bought for 55,700*l.* The Baltic Company migrated thither when the "Baltic" coffee-house in Sweeting's-rents had been demolished to give place to Tite's Royal Exchange. The City Corporation have formulated a scheme for widening Threadneedle-street, by setting back the frontage on that site at a cost of 14,400*l.* We should point out that the *earlier* South Sea House (at one time the *old* Excise Office), in Old Broad-street, was destroyed by fire in 1826; its site was then acquired for the buildings of the City of London Club, 1833-4, erected after the plans and designs of Philip Hardwick, R.A.

The Fine Art Society.

ON Wednesday there was a private view, at the Gallery of the Fine Art Society in New Bond-street, of a collection of water-colour drawings by Mr. A. N. Roussoff, chiefly of scenes in Venice. As on former occasions, the artist appeared rather as a capable executant of topographical scenes in water-colour than as an artist in the higher sense; his drawings are very good, however, and he has an eye for the effect of colour in old buildings, and draws architecture well, which cannot be said sometimes of painters who take in other respects a higher line. In the Venetian scenes in which water is an element, the water seems rather neglected in some cases; it is a surface of colour without the effect of water, except what is gained by the rather easy expedient of reflections of special objects. "Morning on the Lagune" (3) however, is a good effect; also "On the Lagune" (6) with the coloured sails of the craft; but we like the architectural subjects best. Among these may be named "Entrance to the Canal Grande" (13) where S. Maria and the attendant buildings are brilliantly indicated in bright light; "Murano, Afternoon" (11); "Fallen Grandeur" (14), an old palace with the clothes of the present humble inhabitants hung out to dry from the windows; "Cortile behind San Giorgio dei Greci" (22), with the lantern of the campanile rising in bright light in the background; "Near the Giardini" (34), and "San Michele, near Murano" (37).

THE GROSVENOR ESTATE: AND PIMLICO, BELGRAVIA, AND MAYFAIR.

1801-1900.

IN giving a sketch of the history of this portion of London during the past century, we will first direct attention to three or four early plans of the Ebury, Audley, and Goring properties:—Amongst the Duke of Westminster's muniments is Henry Morgan's "mapp or plot of the Lordship of Eburie being situated in the Parish of St. Martins in the Fields, Mrs. Mary Dammison [*sic*] being Proprietess," 53 in. by 23 in., 1675. The lordship, fairly rectangular in shape, has the West Bourne for its western boundary with the road from Knightsbridge to Hyde Park-corner along its northern side. On the map are plotted "King-road," which now traverses Eaton-square as laid out in 1827 by Cubitt in the Five Fields, the "Old Road" (Ebury-street), the "Road from Chelsey to Goring House" (Buckingham Palace-road), having the lordship house and garden at its southern end near where is now Eccleston Bridge, and the "Nete House" close to the south-western corner of Eccleston-square. In the boardroom of St. George, Hanover-square, Vestry Hall hangs a finely-executed plan of the parish, "surveyed and delineated in . . . . 1725 by John Mackay, senr. and junr., mathematicians, of Saint James, Westminster." It is drawn to a scale of 10 poles in an inch, upon

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sheets of vellum, and was renovated ten years ago. A reduced copy of this map is given with the present issue (see lithograph). With that survey may be usefully compared Rhodes' plan of the parish, 1761, and the drawn plan in the Crace collection of the Grosvenor (Mayfair) estate, as in the year 1723, with the intended streets around Grosvenor-square. The parish of St. George, taken out of that of St. Martin-in-the-Fields, was so constituted on March 25, 1725.

The sub-manors of Eyebury or Ebury (the modern Pimlico and Belgravia), Hyde (Mayfair and Hyde Park), and Neyte (Kensington Gardens) constituted the ancient manor of Eia, computed at the time of the Domesday survey to extend over ten hides, or about 890 acres. Eia, comprising the Bulunga fen (Ebury) in Ossulston hundred of King Edgar's reputed charter, 971, to Westminster Abbey, was at one time held by Asgar in virtue of his office as the King's stallere or Master of the Horse and standard-bearer. William I. gave a grant of all the lands held *ex officio* by Asgar to Geoffrey de Magnavilla, ancestor of the De Mandevilles, Earls of Essex. Geoffrey, by one account, bestowed Eia upon the Collegiate Church of St. Peter at Westminster, in return for his burial there. We hear of Eybery farm, covering 430 acres of meadow and pasture, *temp.* Queen Elizabeth, who leased it at 21*l.* per annum to one Whashe. The Ebury property was subsequently brought in marriage by Mary, only child and heir of Alexander Davis (or Davies) of Ebury to Sir Thomas Grosvenor of Eaton, third baronet—they were married in 1676, in St. Clement Danes Church. Alexander Davis had inherited much of his property here from his elder brother, Sir Thomas Davis, a bookseller in St. Paul's Churchyard, and Lord Mayor in 1676-7. Thomas Davis—"my old schoolfellow at Paul's," writes Pepys—was grand-nephew and co-heir of Hugh Audley, or Awdeley, a member of the Inner Temple, who died "great" by repute and "infinitely rich" on November 15, 1662. He had acquired by usury real property estimated, at his death, to be worth 400,000*l.* His will, made on November 4, and proved on November 24, 1662, is rehearsed in vol. vi. (1871) of J. G. and R. C. Nichols' "Herald and Genealogist." We may observe that the will, which occasioned forty years' litigation, relates to his personal property only: he had settled his landed property upon his relations in his lifetime, subject to his own life interest therein. His third sister, Elizabeth, had three co-heirs, one being the Sir Thomas Davis mentioned above. Audley's land in London was fairly co-terminous with the later Mayfair.

The story of Mary Davis's life is a sad one. Her father, a scrivener, who married Mary, daughter of Dr. Richard Dukeson, Rector of St. Clement Danes, died intestate in his thirtieth year, on July 3, 1665, leaving a widow (who soon married again) and an infant child. He was buried in the churchyard of St. Margaret, Westminster. When Mary Davis was but ten years old a private Act, 17 Car. II., was passed to vest her inheritance in trustees; in the following year she was married to Sir Richard Grosvenor, who was scarcely nine years older than herself. Her husband died in his forty-fifth year; his widow died in 1730, having passed the latter thirty years of her life demented and under restraint. Bourdon House, the traditional home of her childhood, yet remains in Davies-street; it is one of the oldest houses on the estate, and contains some finely-carved woodwork apparently of early eighteenth-century date.

Thus the two estates ultimately passed to Sir Richard Grosvenor, Bart., who succeeded his father, Sir Thomas, the third baronet, in 1700. Sir Richard Grosvenor laid out Grosvenor-square in or before 1716; before his death (1732) he had approved of plans for laying out further portions of his estate, chiefly around Grosvenor-square, upon lines which—in Mayfair—had suffered but little change until about thirty years ago. His nephew, Sir Richard, seventh baronet, elevated Baron Grosvenor of Eaton, 1761, and advanced Viscount Belgrave and Earl Grosvenor, 1784, was father of Robert, second Earl, advanced Marquis of Westminster, 1831.

Boundaries.—The Mayfair portion of the Grosvenor estate is bounded on the west by Park-lane from Oxford-street to South-street; on the south by South-street, Farm-street, and the north side of Berkeley-square; on the east by Avery-row (see also "Pimlico and Belgravia") and South Molton-lane that mark the course of the Ay Brook or Tyburn separating it from the Maddoks property; on the north by Oxford-street which in the plan of 1723 is named "Worcester-road." The Ebury portion is bounded on the north by the high road between Albert Gate at Knightsbridge and Hyde Park-corner; on the east by Grosvenor-place, Lower Grosvenor-place, and by a line along the Tyburn between Carlisle-place and Vauxhall Bridge-road, then along Tachbrook-street, and so between Bessborough-place and the Gasworks to the Thames; the western boundary, being identical with the course of the West Bourne and the boundary of St. George's parish, runs almost due south from Albert Gate, behind the east side of Lowndes-square, behind the east side of Cadogan-place, along the east side of Sloane-square, down Holbein-place, then by a curve around Wellington Barracks and the site of Ranelagh to the junction of Chelsea Bridge and Commercial roads, and so to the Thames at the Victoria Pier. From those confines should be excepted a small spoon-shaped portion, the Lowndes property, between Lowndes-square and Wilton-crescent; and there should be added the outlying site of Peterborough, or Belgrave, House and grounds, now traversed by Page and Grosvenor streets within the angle formed by the junction of Horseferry and Grosvenor roads, bought by Alexander Davis of Ebury.*

MAY FAIR.

The manifold changes that have been made within the last thirty years or so in this quarter of the town, and for their greater portion upon the Grosvenor Estate, comprise an extensive demolition, with rebuilding, of house property in Park-lane, North and South Audley-streets, Park, Duke (Grosvenor-square), Davies, South Molton, Green, Brook, Mount, Aldford (until 1888 Chapel), Down, and Curzon-streets, Grosvenor-place (1767), Charles-street, Grosvenor-square (renamed Carlos-place), the south side of Oxford-street between Park-lane and South Molton-street (including Hereford-gardens), North-row, and Shepherd's-market, together with a large number of mews, minor thoroughfares, and so on, whose sanitary condition had become unsatisfactory. Chesterfield-gardens absorbs most of the garden of Chesterfield House (Isaac Ware, 1748), of which the colonnades on either side are now closed in. Sir Michael Arthur Bass, Bart., elevated Baron Burton in 1886, bought the house from Charles Magniac, M.P., in 1885, when it was rehabilitated under Mr. R. W. Edis's superintendence. In the autumn of 1896 were pulled down Nos. 94-104, Park-street (east side), between Green-street and Lees-mews, together with Nos. 55-9, Green-street (south side), between Park-street and Hampden House, the Duke of Abercorn's, and premises in the rear abutting upon Lees-mews and Shepherd's-place-buildings. The whole, two houses at its west end excepted, of Mount-street has been rebuilt. Of the new premises we may mention the shops at the corner of South Audley-street, 1893, by Mr. A. T. Bolton, and No. 54, at the corner, north, of Park-street, by Mr. Fairfax B. Wade for Lord Windsor. The old St. George's Vestry Hall (1789), rebuilt at a cost of 15,362*l.*, the site costing 11,624*l.*, was opened on April 23, 1887. The architects were Messrs. Ernest George & Peto, who designed also the adjoining block of chambers and shops [May 15, 1886].† St. Mark's Church, North Audley-street, by Peter John Gandy Deering, R.A., who took the Erectheum as his model, was built in 1825-8, and cost 5,600*l.* In South Audley-street, Nos. 61-2-3 are by Mr. W. Lambert, 1890; Nos. 69-70-1 were built in 1899 by Mr. Lovatt, who contracted for 12,500*l.*, Mr. Howard Chatfield Clarke being the architect; the Public Library in Chapel-place North, near the Grosvenor Episcopal Chapel, and opened on July 1, 1895, is by Mr. A. T. Bolton; Audley Mansions, North Audley-street, are by Mr. Wimperis. We may mention, too, in Green-street, No. 32, Lord Ribblesdale's, by Mr. Sidney R. J. Smith, and a block of residential flats by Messrs. Henry S. Legg & Son, 1896, Messrs. Bywaters & Sons being the contractors for 12,847*l.*; the Coburg Hotel in Carlos-place (as widened) and a house by Messrs. Isaacs and Florence, 1895-6; No. 3, Hertford-street, by Mr. W. Flockhart; a block of five houses in South-street [December 11, 1897], built by Mr. Willett, the architect being Mr. J. J. Stevenson; and the two sets of three-story stables on the south side of North-row, Park-street, by Mr. Sidney R. J. Smith (1898). Messrs. W. Cubitt & Co. built the block of six houses on the east side of Park-street, between Green-street and the "Hereford Arms," in 1896, from Mr. H. O. Creswell's designs. A. Salvin (*obiit* December 17, 1881) prepared the plans and designs of No. 9, Chesterfield-gardens, distinguished by its fine staircase, for the late Lord Leconfield, but advancing years compelled him to relinquish its completion. In 1835 Salvin carried out extensive alterations at Grosvenor (formerly Gloucester) House, to which T. Cundy added the Roman Doric colonnade or screen facing Upper Grosvenor-street in 1842, and the west wing, or picture gallery, facing Park-lane; the garden wall along Aldford (formerly Chapel) and Park streets was rebuilt in 1895-6. In 1889 the parish burial ground, 1½ acres, lying between Mount and South streets, was opened to the public.

Farm-street.—The church of the Immaculate Conception, 1846-9, the first erected in London for the Order of Jesuit Fathers, is by J. J. Scoles [June 2, 1849]. Clutton added the chapel of the Blessed Sacrament in 1858-9. The high altar given by Miss Monica Tempest, of Broughton Hall, Yorkshire, at a cost of about 1,000*l.*, was designed by A. W. Pugin; the window above it is by Wailes. It is believed that Scoles based his design for the early fourteenth century south front upon that of the south front of Beauvais Cathedral. Of the Fathers' adjoining residence we published Messrs. Goldie, Child, and Goldie's original designs, modified in the building, on July 10, 1886. Last year Mr. Romaine-Walker began an enlargement, with a new aisle, of the church to cost about 15,000*l.* For the rebuilding of the United Steuart and St. George, Hanover-square, Parochial Schools [December 17, 1898] a tender of 13,675*l.* by Messrs. Dove Brothers was accepted in June, 1897. By reason of the exigencies of the site Mr. P. A. Robson's planning is unique after its kind. The playgrounds are sunk, and extend beneath the main building, whilst the cookery school is entered from the girls' playground, beneath the teachers' houses, the latrines being arranged in a tower between the houses and the schools. Mr. Robson's original plans, placed first in a limited competition in 1896, were not carried out by reason of certain revised requirements on the part of the late Duke of Westminster, who contributed a considerable sum besides the site. A new scheme was accordingly designed.

Park-lane and Hamilton-place.—In pursuance of their Park-lane Improvement Act, 1869 (32 and 33 Vic., c. 134), the late Metropolitan Board of Works extended Hamilton-place, built upon Crown lands in 1805, northwards into Park-lane, and at the same time increased its width from 30 ft. to about 60 ft. E. Thirst and W. Webster were the contractors for the improvement, the net cost being 110,968*l.* The new thoroughfare was opened in June, 1871. Londonderry (formerly Holdernesse) House was designed by Samuel Wyatt (*obiit* 1807) and his nephew, B. Dean Wyatt (*obiit* in or about 1850). In 1812 Sir John Soane designed No. 18, Park-lane. On the three-sided site at the corner of Deanery-street, near Stanhope Gate, and facing southwards, stands Dorchester House [August 28, 1852], built in 1848-57 by W. Cubitt & Co. for the late R. S. Holford, M.P., from the plans and designs of Lewis Vulliamy (*obiit* 1871). The house contains some of the finest domestic work of Alfred Stevens who died in 1875, especially the fixed furniture and the chimney-piece of the dining-room, of which latter one figure is illustrated—after a drawing by Mr. W. R. Lethaby—in our number of April 21, 1894. In December, 1892, were demolished the seven houses between Aldford and Mount streets; the Office of Woods and Forests sold the materials of Nos. 7-10 and of No. 13, Grantham-place on April 25, 1900. Mrs. Brown presented the drinking-fountain at the junction with Hamilton-place; it commemorates the Fathers of English Poetry, and is the work of Thomas Thornycroft, 1875. No. 1, Park-lane is by A. Peebles (*obiit* May 21, 1891), Breadalbane House, 1818-24, by Wm. Atkinson (*obiit* May 22, 1839), and a recent block of houses by Mr. Sidney R. T. Smith. At the corner of Aldford-street is No. 26, built in 1895-6 of Portland stone by

* See our article "Westminster, Old and New," in *Builder* of January 12, 1901 (p. 36).

† Dates within *square* brackets relate to illustrations in the *Builder*.

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Messrs. Trollope after Messrs. Balfour & Turner's designs and plans, for Mr. Beit, the site costing, it is said, 170,000*l.* The decorative panels on the exterior walls are by Mr. Harry Pegram, the general interior carving by Mr. L. A. Turner. The late Mr. B. T. Barnato's house, No. 25, since purchased by Sir Edward E. Sassoon, Bart., occupies the site of (old) Stanhope House, bought with the freehold for 50,000*l.* It was built by Messrs. Colls & Sons, whose contract for the principal floors only in carcase amounted to 30,940*l.*, Mr. T. H. Smith being the architect [October 10, 1896]. Messrs. Balfour & Turner designed Nos. 2 and 3, Balfour-place, constructed of Suffolk bricks with brown Portland stone dressings [June 12, 1897]. Stanhope House, on the site of No. 8, Great Stanhope-street, 1899, is by Mr. W. H. Romaine-Walker, and is remarkable for its elevations entirely worked in grey Forest of Dean stone. Brook House, Lord Tweedmouth's residence, 1867-70, by Thomas Henry Wyatt (*obiit* 1880), erected about thirty-five years ago, is, we believe, one of the first mansions in this part of the town constructed of the now prevalent red brick with stone dressings [July 23, 1870]; J. & C. I'Anson were the contractors; Wright & Mansfield executed the elaborate decorative works.

Grosvenor-square.—Since the houses were renumbered in 1888, a circumstance one is apt to overlook, as in the similar instances of Berkeley and St. James's squares, we may state that the historical No. 39, Lord Harrowby's, the projected scene of the Cato-street conspiracy, February 23, 1820, is now No. 44. Two houses on the north side with what was formerly Lord Derby's—built in 1773 by Robert Adam—and those at present numbered 3, by Sir John Kelk, Bart. (*obiit* 1886), for his own residence, 4, 26-7, 30, 38-9, 40-1-2 have been rebuilt. No. 26 is on the site of the former No. 23, Lord Derby's; No. 30, John Wilkes's, is re numbered "35."

Brook-street.—In the autumn, 1894, were sold the effects of Claridge's Hotel, and the building was pulled down in December. Mivart established the hotel in the days of the Regency; it is not generally known that a suite of private rooms were reserved there for the Prince Regent. The courtyard was rebuilt by Mr. W. D. Caroë [June 13, 1891]. Messrs. Trollope erected the new hotel reopened in November, 1898, by the Savoy Hotel Syndicate. Constructed, at a cost of about 120,000*l.*, of the Essex brick so largely used upon the Duke's estate, with rubbed brick dressings and red Mansfield stone, the fabric cost about 120,000*l.* Mr. C. W. Stephens was the architect, Messrs. Ernest George & Yeates designed and supervised the interior decoration of the ground and part of the first floors.

Curzon-street, Bolton-row, and Shepherd's-market.—In November, 1899, the site of Curzon-street Chapel, bought from Lord Howe, and of a part of Market-street, was cleared for some buildings to be erected by Messrs. Romaine-Walker & Besant for the Duke of Marlborough. The *Penny London Morning Advertiser* of June 4 and 6, 1744, announces the building of the chapel—upon a plot of ground opposite the "old chapel"—and states that marriages would be performed there upon payment of one guinea, "Mr. Keith having given his register to the new clergyman." See also a "Note" in our columns of December 23, 1899. The carved oak pulpit has, we believe, been removed to the parish church of Penn, Buckinghamshire. Some portion still remains of the market buildings, named after Edward Shepherd—the architect, it seems—who in 1708 was rated to the poor of St. Martin-in-the-Fields parish "for ground-rent of the fair, market, and one house, *il.* 1s." The fair, a survival of one granted by Edward I. to St. James's Hospital, was established *temp.* James II., and held at Maytime in the Great Brook Field, fourteen acres on the right bank of the Ay Brook or Tyburn, a part of Lord Berkeley of Stratton's estate, and now covered by Curzon, Charles, Farm, and Hertford streets, Chesterfield House, Chesterfield-gardens, Shepherd's-market (old), Bolton-row, &c. Curzon-street marks the principal line of the stalls and booths; the ducking-pond was in Hertford-street. Building upon the land began in 1703-4; the fair, discontinued in 1708, but for a while revived, was finally abolished about 1770. At their meeting on December 3, 1886, the late Metropolitan Board of Works resolved to rename Charles-street, Grosvenor-square, as Carlos-street (since renamed Carlos-place) and to incorporate Bolton-row, Nos. 1-13, with Curzon-street, Nos. 1-60; the houses in the latter street are now Nos. 1-72. Messrs. Perry & Co., who contracted for 24,282*l.*, built the mansions, No. 17, Stratton-street, and having a return front to Curzon-street, from Mr. R. J. Worley's designs and plans [March 4, 1893]. In Charles-street, Berkeley-square, No. 7 was rebuilt by Thomas Little (1802-59), and No. 11 by Messrs. Wimperis & Arber [July 18, 1891]. No. 11, Hill-street, has been recently rebuilt for the Duke of Newcastle by Mr. R. W. Edis, who prepared the designs for several blocks of houses and flats upon the Grosvenor estate.

Davies, Gilbert, and Duke streets.—The materials of Nos. 56-76, Davies-street and of Grosvenor-market, at the north-east end, were sold on August 20, 1889; on May 11, 1893, those of Nos. 67-73 (odd); in 1898-9 the north end of the street was widened and straightened into Oxford-street. No. 56 is the headquarters of the 1st Middlesex (Victoria and St. George's Rifles) Volunteers, built after Mr. C. H. Shoppee's plans and designs, and opened by Catherine Duchess of Westminster on December 6, 1890 [October 24, 1896, "Sketches of London Street Architecture," VII.]; No. 53 is the Grosvenor estate office. St. Anselm's Church and vicarage, by Messrs. Balfour & Turner [February 22 and April 18, 1896], has replaced Professor Cockerell's Hanover Chapel [March 2, 1895] pulled down in October, 1896; the Commissioners of Woods and Forests acquired the chapel and its site for 45,000*l.*, which was devoted to the building and endowment of St. Anselm's. Messrs. Walter Holt & Son's contract amounted to 20,000*l.*, the late Duke giving the site. The church is a singular structure, utterly unlike any other place of worship in London. In Duke-street is Mr. Alfred Waterhouse's Congregational Church [January 18, 1890] erected by Messrs. Shillitoe & Son, of Bury St. Edmunds, at a total cost of nearly 30,000*l.*, with the proceeds — about 37,000*l.*—of the sale by the trustees of the old King's Weigh House Chapel, originally founded in 1662 at Fish-street-hill, of which the site had been taken in 1883 for the Inner Circle railway. With the church was amalgamated the adjacent Robert-street Chapel, the parsonage—also by Mr. Waterhouse—we illustrated on August 20, 1898, No. XXVII. of our series "Sketches of London Street Architecture." The houses at the corner of Davies-street and South Molton-lane (1889) are by Messrs. Wimperis & Arber. Mr. W. D. Caröe designed the new Hanover schools in Gilbert-street [February 20, 1892], opened on March 4, 1889, by the late Duke, who gave the site to replace the schools in South Molton-street, Messrs. Turtle & Appleton's contract for the buildings being 5,115*l.*

Notabilia.—Grosvenor Episcopal Chapel, South Audley-street, 1730. Several houses in Mayfair by T. Cundy. Some interior fittings of Mr. Stewart Hodgson's house, South Audley-street, removed thither from No. 8, Billiter-square, E.C. (1730-1878). No. 2, Seamour-place, Park-lane, modernised in 1835 for Lord Ducie by J. B. Papworth (*obiit* 1847). Nos. 16-26, Mount-street, by Messrs. Read & MacDonald. Block of flats, No. 51, South-street, by Mr. E. K. Purchase. House in Audley-square, for Lord Arthur Russell, by T. H. Wyatt.

Rebuilding upon the Grosvenor Estate.—The Improved Industrial Dwellings Company erected Stalbridge-buildings in Lumley-street (opened March, 1887), Clarendon-buildings in Balderton-street (1872), Balderton-buildings (1887), Cavendish-buildings in Gilbert-street (1889), Chesham-buildings and four other blocks in Gilbert and Robert streets (1886-92) on the ground between Oxford-street and Grosvenor-square and Brook-street. Duke-street-mansions were built in 1887. The late Duke opened the public garden in Duke-street on November 9, 1889. At various dates within the interval August, 1888, to August, 1898, were sold at auction the materials of Nos. 19-31, with the Grosvenor riding-school, South-street; Nos. 3-6, 21-9, and 33-4, North-row; 1-5, Brown's-place, Park-street; 25-31 and 35-40, North Audley-street; 64-8 and 70-70A, South Audley-street; 30-8, with Adam's-mews in the rear, 58-63, and 68-77, Mount-street; 1-3, 22-9, and 31-3, Green-street; 5, 7-14, and 25-36, Aldford-street, with Robson's-yard, Aldford-mews; 1-13, and 107-19 (odd), with part of Eaton-place, 18-28, and 30-42 (even), with Reeves-mews and Bell-yard in the rear, Park-street; 43 and 45, Farm-street; 12-8, Norfolk-street; 1-5, Ham-yard, and 2-8, Street's-buildings, Park-lane, and the seven houses in Park-lane between Mount and Aldford streets; 24-9, Robert-street; 5-7, Cock-yard; 67-73 (odd), Davies-street; and 52 and 54, Brook-street. In May last the Company erected on the front of Chesham-buildings a tablet to commemorate the late Duke of Westminster's philanthropic efforts for the better housing of the working classes in London.

At Cambridge House (then numbered 70), South Audley-street, John Robins, the auctioneer, sold Queen Caroline's effects. Nos. 11-2, North Audley-street, by Lord Burlington, for the Countess of Suffolk. Grosvenor-square lighted with oil lamps until a late period; some of the iron link-extinguishers and stone obelisks have survived in the square, at Nos. 28, 37, and 44-5; and in Curzon, Hill, and South Audley streets.

In the evening of Monday, February 8, 1886, a demonstration of the unemployed begun in Trafalgar-square ended in a riotous march of some 1,500 "Socialist Democrats" along Pall Mall, St. James's-street, and Piccadilly, considerable damage being done on the way, into Mayfair, where many houses and shops were attacked and pillaged.

PIMLICO AND BELGRAVIA.

The Crace collection contains a set of four interesting plans copied by Frederick Crace from the originals which show the land from Piccadilly to the Mulberry Garden and Goring Great Garden that Sir Thomas Grosvenor sold to the Earl of Arlington for 3,500*l.*, by a conveyance dated October 22, 1681; the Goring estate, as in 1640, with Goring House, on the site of which now stands Buckingham Palace; and Sir Charles Sheffield's land, formerly the Mulberry Garden, four acres, where are now the grounds and the north-west wing of the Palace. Charles Goring, second and last Earl of Norwich, let Goring House in 1666 to the Earl of Arlington; on the west side of its fountain garden were the orchard and kitchen garden belonging to Hugh Audley. The Mulberry Garden, planted by James I. in 1609 for the home manufacture of silk, and "to wean his people from idleness and the enormities thereof," subsequently became a highly fashionable resort, and then was demised by Charles II. in 1673 to Lord Arlington.

Buckingham Palace.—On July 13, 1837, Queen Victoria first occupied the Palace, which had been erected after John Nash's plans and designs—his pupil, Charles Mathews, the comedian, made the drawings—during the reigns of George IV. and William IV., but it is said was never occupied by those two Sovereigns. For Nash's palace was taken the site of Buckingham, more correctly Buckinghamshire, House, built in 1703-5 from the designs of Captain Wynde, or Wynne, on the site of Arlington, formerly Goring, House, which in 1689 Isabella, Duchess of Grafton, daughter and heir of Lord Arlington, had sold to John Sheffield, Duke of the County of Buckingham and Normanby. The house, as rebuilt by the Duke (*obiit* February 24, 1721), was sold in 1761 for 21,000*l.* by Sir Charles Sheffield, and settled upon Queen Charlotte, by the name of "The Queen's House," in lieu of Denmark House in the Strand. In Vol. II. of Pyne's "Royal Residences" is printed a long letter addressed to the Duke of Shrewsbury, wherein the Duke of Buckinghamshire gives a charming account of his home. It is also described in De Foe's "Journey through England." The house (see lithograph), constructed of red brick with stone dressings, in three floors, had two wings of two floors and an attic story with which it was connected by curved galleries. The principal elevation, facing north-east, had nine windows to each row, with two ranges of four pilasters of the Corinthian and Tuscan orders, the latter being above. The wings, used as offices and servants' rooms, were — as were also the galleries—fronted with Tuscan, Doric, and Ionic pillars. In the forecourt was a fountain basin with central sculptured figures.

In 1847 Blore enclosed Nash's quadrangle with an east front, 360 ft. long, facing the Mall; the forecourt was extended in that direction, the new railings and piers being by Decimus Burton (*obiit* 1881), the sculpture on the piers by John Thomas (*obiit* 1862); three years afterwards Nash's Marble Arch, 1825-7, was removed to Cumberland Gate, Hyde Park. John Nash designed the entrance to the Queen's Mews, 1824, which cost 63,181*l.* The mews clock by Vulliamy has stone dials 6 ft. 10 in. in diameter and sunken figures with a sunken centre traversed by the hour-hand, in order to eliminate nearly all error arising from parallax. Blore's estimate of 150,000*l.* for the new works included extensive re-arrangements in the northern and southern wings, new kitchens, guard-house, redrainage, and the park-gates at Buckingham Gate. Sir James Pennethorne added the state ballroom, supper-room, and galleries in the south wing.

Buckingham-gate and Buckingham Palace-

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road.—In the spring, 1900, James-street was renamed Buckingham-gate. Turning to Salway's survey of 1811, we see that the houses between James-street and Charlotte, now Palace-street, form Stafford-row, next (south) are Queen's-row extending to Prince's-row, opposite the "Bag o'Nails" and the "Goat" in Arabella-row, and then Dukes-row and the road "to Battersea-bridge." Stafford-row was named after Sir William Howard Viscount Stafford, beheaded in 1680, the second son of Thomas, Earl of Arundel, Surrey and Norfolk, for whose wife, Aletheia, was built by Nicholas Stone, the adjacent Arundel-house, latterly known as Tart Hall, pulled down in or about 1720. On the site of the "White Horse" at the corner of James-street and Stafford-row is the office of the Duchy of Cornwall, by Sir James Pennethorne [November 3, 1855], built instead of the former office in Somerset House in terms of an Act passed in 1854 (17-8 Vic., c. 93) with a sum of 16,880*l.* voted by Parliament. The opposite park gates are by E. Blore. At the corner (south) of Stafford-place stood until 1857 one of the famous old Pimlico taverns and tea-gardens, the "Gun," having a field-piece for its sign (see lithograph); Buckingham Palace Hotel stands on a portion of the site. The Grosvenor Hotel was built by Mr. Kelk in 1860-1 upon his own land at a cost of about 100,000*l.*, from the design of J. T. Knowles [June 1, 1861]. The exterior carving is by Dayman. The fabric measures 262 ft. by 75 ft. in depth, and rises 150 ft. to the top of the roof. The London, Brighton, and South Coast Railway Company framed a scheme in 1898 for an enlargement of their terminus from 6½ acres to 14½ acres, with extended platforms for eighteen instead of only eight trains by taking all the property between their existing boundary and the south-east side of the main road between Ebury Bridge and the station. Mr. Morgan, their engineer, has estimated that the project will cost 1,088,000*l.*; the hotel, bought by the railway company in 1899 for, it is said, 240,000*l.*, has undergone extensive structural alterations under the supervision of Mr. Alfred Waterhouse, R.A., and Mr. Morgan. Continuing southwards we reach Buckingham Palace-gardens, built upon the Grosvenor estate by Mr. Willett about seven years ago after Mr. J. J. Stevenson's plans and designs [December 30, 1893; and two of the porches February 9, 1895]; St. George, Hanover-square, Public Library opened on July 7, 1894, and Public Baths erected on the site of the old Baths, Nos. 80-90 (even), by Messrs. J. Mowlem & Co., at a cost of about 30,000*l.* after Mr. F. J. Smith's designs, and opened on May 7, 1890. The St. Peter's Institute and Gymnasium, 1890, is by Mr. E. F. C. Clarke; the National Training School of Cookery, originally established at South Kensington by the late Sir Henry Cole, was built in 1888-9 from Mr. Purdon Clarke's designs at a cost exceeding 8,000*l.* T. Cundy was the architect of St. Barnabas Church and Schools, 1850, which mark the site of the Orange Tea-gardens. At the end of Five Fields-row stood the "Star and Garter," famed for its equestrian exhibitions and fireworks. Holy Trinity, in Bessborough-gardens, is the first church built in London by J. L. Pearson, R.A.; it was erected at Archdeacon Bentinck's cost, and consecrated on May 25, 1852. Of the east window the central light is by Wailes, the six other lights are by Gibbs; the organ is by Walker.

The Waterworks, "Jenny Whim's," the Neat Houses, and (old) Millbank.—The lease for ninety-nine years of 89 acres in (old) Millbank to the Chelsea Waterworks Company expired on Lady Day, 1823. John Mackay's plan, 1727, is entitled "Plan of the Estate belonging to Dame Mary Grosvenor, let to the Chelsea Waterworks, near Millbank, on the River Thames"; Dame Mary was Sir Thomas Grosvenor's widow. Peter Potter drew a plan of that estate in 1815; in the fourth edition, 1819, of "Horwood's Survey" are marked "the cuts to supply Chelsea Waterworks and Pimlico Wharf." A "fire engine" stood at Pimlico Wharf on the south side of Shaftesbury-terrace, where is now the forecourt of Victoria Station; compare J. W. Wallis's map of 1823. Chelsea (Ebury) Bridge (see lithograph), situated between the "Monster" tavern and Stone Wharf at the south-western end of Bridge-row (Buckingham Palace-road) crossed the cuts at the north end of St. George's-row, latterly absorbed in Sutherland-terrace; see "Horwood's Survey," 1795 and 1819*. At the south-east end of the wooden bridge was the popular resort known as Jenny Whim's (or Jenny's Whim) tea-gardens and tavern, near the Flask. Next, northwards to Stone Wharf lay Avery Farm-row (see also "May Fair"), now Ebury-square, and the Dwarf tavern and gardens, afterwards New Spring-gardens, opposite the north-eastern end of Ranelagh-walk (or grove). The Waterworks Company, incorporated in 1722-3, had built their first engine-house at the Ranelagh osier beds, using the stones of St. Martin-in-the-Fields church pulled down two years previously. In 1812 they acquired about twenty acres for new works and an engine-house on the western side of Turpentine-lane (Westmoreland-street), which separated them from the Neat House Gardens; in 1829 their filtering-beds, which that Company first adopted, were at Thames Bank. In 1726 they purchased for 400*l.* the undertaking of the Millbank Water Company (1673); their reservoir, latterly known as the Queen's Basin, and often, but erroneously, cited as Rosamund's Pond, in the north-east corner of Green Park, was filled up in 1842; the reservoir (1725) in Walnut Tree-walk, Hyde Park, near the Duke of Gloucester's riding-house—where is now the enclosed round garden—remained, together with the engine-house, until 1835.

An excellent map published in 1836 for the Society for the Diffusion of Useful Knowledge delineates the Neat Houses as extending along the riverside between Millbank Distillery (west) and the southern end of old Grosvenor (since Belgrave) road (east), where is now St. George's-square. To the north of them lies Cross-lane, since Lupus-street; to the south are the present Pimlico Pier, the Royal Army Clothing Department, and All Saints' Church, Grosvenor-road, 1871 (T. Cundy, *obiit* 1895). The Distillery, afterwards Cook's, was established about ninety years ago at the south-western corner of Baker's-lane, since Caledonia-street. Neat House Gardens, until Basevi and Cubitt laid out that part of the estate, covered the three-sided area bounded by the present canal, Vauxhall Bridge-road (about 1810), and the later Grosvenor-road; Willow-walk, since Warwick-street, traversed their northern portion, and just beyond were the Osier Beds, which have since become the site of Hugh-street and Eccleston-square. The Neat Houses formed a settlement of cowkeepers and market gardeners. The Neate, formerly owned by the monks of St. Peter, and contained within the sub-manor of Ebury, is often confused with the equally ancient sub-manor of Neyte, now represented by Kensington Gardens.

Robert, second Earl of Grosvenor, advanced Marquis of Westminster in 1831, bought the Five Fields in 1825 for, it is said, 30,000*l.*,† and forthwith began to build upon the land, overlaying the marshy soil and filling up the many water-cuts of southern Pimlico with soil from the excavations for St. Katharine's Docks by the Tower; his chief builder was Thomas Cubitt. In 1825-9 George Basevi, the younger, planned and designed Belgrave-square, 684 ft. by 637 ft., the detached houses at the angles being by Hardwick and H. E. Kendall. Sir John Soane designed the gallery, with its lantern, of Chantrey's house in Eccleston-street. Lowndes-square, named after the ground landlord, W. Selby Lowndes, and built in 1837-9, stands on the site of the "archery and rural castle" plotted, 1819, by Horwood, who shows all vacant ground between Grosvenor-place and the West Bourne; on the square's southern side are seven houses, after the Italian style, by Lewis Cubitt. In Eaton-square, 1,637 ft. by 371 ft., is the church of St. Peter, 1824-7, by Henry Hakewill (*obiit* 1830), and rebuilt after its destruction by fire in 1836 by his son James from his father's original drawings. Some alterations of the interior were made in 1894 at a cost of about 2,100*l.* by Sir Arthur Blomfield (*obiit* 1899), who also designed the chancel screen and its gates.

St. George's Hospital and Grosvenor-place.—In the Foundling Hospital is Wilson's picture, 1746, of St. George's Hospital, formerly Lord Lanesborough's "country house," which was leased in 1733-4 by a committee for purposes of an infirmary. To the house, which faced Hyde Park, they added two wings, after I. Ware's designs as shown in his own contemporary print, 1733. The old hospital also is seen in the paintings of Hyde Park-corner, presented by Miss Emily J. Wood to the National Gallery in 1886. One picture is labelled "Unknown—Eighteenth Century (?)," the other "By James Holland—b. 1800, d. 1870." W. Wilkins (*obiit* 1839) rebuilt the hospital in 1828-30. Some extensive reparations were carried out in 1850. In 1859 an upper story and in 1868 a new wing were added by Arthur P. Mee (*obiit* 1868), and in 1896 Mr. H. Percy Adams added a suite of rooms which embraces the large (east) operating theatre as remodelled by him, the small (west) theatre, which is new, together with nurses' rooms, offices, &c.; the new southern block overlooks the sites of Tattersall's-yard with the "Turf" tavern at the yard's upper end (Grosvenor-crescent), and the former Lock Hospital. Richard Tattersall, the Duke of Kingston's stud-groom, began business there in or about 1778. George Tattersall built the subscription-room and the counting-house. In 1865 Tattersall's migrated to Knightsbridge, where on a site of two acres on the west side of the Green, new subscription-rooms, stables, an auction-yard, &c., had been built by Holland & Hannen from Charles Freeman's plans and designs. The Lock Hospital, of which the chapel (1764) gave a name to Chapel-street, was established in 1746, and forty years afterwards the Rev. Thomas Scott, the commentator on the Bible, founded the Asylum; the institution was removed to the Harrow-road, near Westbourne-green, where a new hospital for sixty patients had been erected, 1842-3, after L. Vulliamy's designs. Salway's survey of 1811 plots the "3rd Regiment of Guards Hospital" at the corner (north) of Osnaburgh-row, now Hobart-place, and then southwards, Grosvenor-street West, with the "King's-road" (Ebury-street) along its northern side. Next are Ranelagh-street, Arabella-row (Lower Grosvenor-place) and the "Bag o' Nails"—its sign being a corruption of Ben Jonson's Bacchanals—which is now No. 6, Buckingham Palace-road, and was greatly altered in 1890 by Mr. H. I. Newton. T. Cundy was the architect of the St. Michael's, the St. Peter's, and the Ebury-square Schools, of Belgrave Mansions, and of most of the houses in Upper and Lower Grosvenor-gardens, Grosvenor-place, Grosvenor-crescent, and Wilton-crescent.

Notabilia.—Churches: St. Paul, *Wilton-place*, 1842-3—T. Cundy; chancel enlarged and refitted, 1870—Withers. St. Saviour, *St. George's-square*, 1863-4—T. Cundy. St. Michael, *Chester-square*, 1844—T. Cundy; chancel extended, 1874-5. St. Gabriel, *Warwick-square*, 1853—T. Cundy; enlarged, 1897—Mr. Arthur Baker, of Messrs. Baker & Turrill; east window—Mr. Kempe; the church-house, hall, and clubrooms in *Glasgow terrace*—Mr. W. Campbell Jones. St. John the Evangelist, *Wilton-road*, 1873-4—Sir Arthur Blomfield. St. Mary, *Graham-street*, 1873-4—Withers. St. Philip, *Buckingham Palace-road*—Messrs. Demaine & Brierley [September 17, 1887]. Belgrave Chapel, *Halkin-street*, about 1825—Sir Robert Smirke (*obiit* 1867). St. Saviour, reredos, font, chancel screen, corona, and decorations—Mr. Romaine-Walker; the Sir John Tilley memorial window—Mr. C. E. Kempe. St. Barnabas, reredos—Messrs. Bodley & Garner.

House for Earl Brownlow, *Belgrave-square*, and house for the Earl of Oxford, *Halkin-street*—Sir Robert Smirke. No. 1, *Grosvenor-crescent*, the smaller drawing-room; and the drawing-room, 29, *Chesham-place*, 1880-7—Professor Aitchison. Lord Radnor's Conference Hall, *Eccleston-street*—W. A. Boulnois (*obiit* 1893). Nos. 1 and 1a, *Belgrave-square*, 1899—Mr. P. A. Todd. Block of residential flats, *North-street*—Mr. E. J. Sadgrove, a tender of 60,000*l.* from Messrs. Stephens, Barstow, & Co., of Bristol, accepted in February, 1897. Police-station, *Gerald-road*, *Eaton-square*, 1893—Mr. J. Dixon Butler. Pimlico Literary Institution, *Ebury-street*, 1830—P. J. Gandy-Deering. Pantechnicon, *Motcombe-place*, 1830, rebuilt after the fire 1874. Hudson's fireproof depositories, near Victoria Station, 1896-8, Mr. H. B. Gammon, contractor, 5,685*l.*—Messrs. W. H. Cross & Kekwick. Park lodge and improvements and gates, *Birdcage-walk*—D. Burton. Westminster (or Grosvenor) House, for Sir E. Antrobus—Sir G. G. Scott.

Buckingham Palace-road.—Soldiers' Home, altered and enlarged, 1898—Mr. Robert Curwen; block of residential flats—T. Pilkington (*obiit* 1898); shops and houses for the Grosvenor Hotel Company, 1894—Mr. W. A. Large.

Buckingham Gate.—No. 20, James-street—Mr. R. T. Blomfield (the carved brick frieze by Mr. Harry Pegram) [August 8, 1896]; Buckingham

* The position of the old bridge is shown on the St. George's Parish map in the present issue, at the head of the basin marked "Chelsea Water-works Canal."

† In "The Story of My Life" (1900), Mr. Augustus J. C. Hare says that the Court wished to buy the land, because it lay so close to Buckingham Palace, but thought the sum asked for was too much, and that Cubitt afterwards offered a ground-rent of 60,000*l.*

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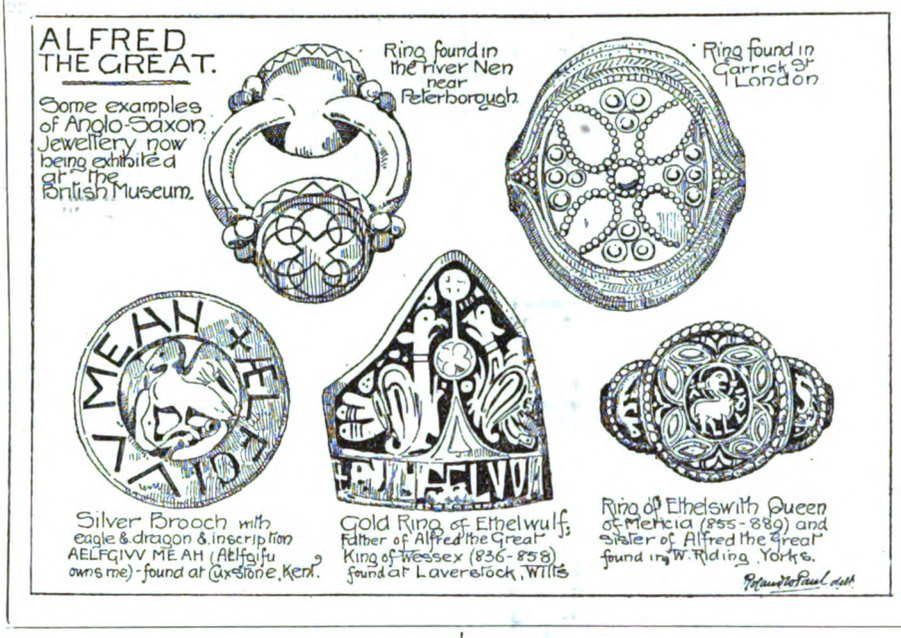

Palace Mansions, built by Mr. J. J. Hall, of Dover, 21,000*l.*—Mr. C. J. C. Pawley. Old Westminster Chapel (1840)—John Tarring (*obiit* 1875). Palace Chambers—Messrs. Martin & Purchase [plan, January 26, 1901].

Dr. Dodd's Chapel in Charlotte (now Palace) street, converted, 1880, into St. Peter's, a chapel-of-ease to St. Peter's, Eaton-square. Flask-row renamed Semley-place, Ebury-street.

Ebury-square Garden leased (1884) at a peppercorn rent to the Metropolitan Public Gardens Association by the late Duke, who gave (1885) a general consent to the opening during the autumn months to the public of the square gardens, and of Lower Grosvenor Gardens under the Association's supervision.

SAXON ORNAMENTS OF THE TIME OF ALFRED THE GREAT.

IN connexion with the Millenary of Alfred the Great, a number of objects of Anglo-Saxon date are now being exhibited in the Central Saloon of the British Museum. In four cases are arranged examples of jewellery and coins, also MSS., charters, literary works, and laws of King Alfred. Some of the specimens of jewellery are of great interest; in more than one instance they have belonged, if not to the King, to one of his relatives, as is shown by their inscriptions, and the workmanship is in many cases remarkable for its extreme delicacy. In the centre is a careful copy by Messrs. Payne, of Oxford, of the famous jewel found in Somersetshire, between Athelney and Bridgwater, and now in the Ashmolean Museum at Oxford. Hardly less interesting are two rings —both of which we illustrate—one a gold ring which belonged to Ethelwulf, King of Wessex (836-858), father of King Alfred, and the other a ring of Ethelswith, Queen of Mercia (855-889), sister of Alfred. The first is of gold filled with niello, and the front is in the form of a mitre, the design being a tree (?) surmounted by a cross with a bird on either side. Below is an inscription, EĿHELVVLF Rx (Rex). This remarkable ring was found in 1780 in the parish of Laverstock in Wiltshire, and sold by a labourer to a jeweller at Salisbury for 34s. It is a good deal out of shape, as will be seen by the drawing. The second ring is also of gold and niello, with a bezel in the centre, ornamented with the Agnus Dei and the letters A and D on either side. The shoulders at the side have a dragon and a grotesque animal. "On the back of the bezel is scratched in three lines +EADEL SVID REGNA (Regina), showing that the ring once belonged to the sister of Alfred the Great, who married Burhred, King of Mercia, in 855. She died abroad, and was buried at Pavia." This ring was ploughed up in the West Riding of Yorkshire, between Aberford and Sherburn.

Of ten other rings in the collection, one is of agate, one of bronze, and the rest of gold. Of these we illustrate two, a fine gold ring found in Garrick-street, London, and a curious example found in the River Nen near Peterborough. The example from Tipperary was originally filled with slabs of garnet. A gold finger ring with a "pearled" edge bears the name of its owner, Ethred, and its maker, Eanred, the inscription being on a nielloed ground; and a very fine example of a ring, evidently once belonging to an ecclesiastic, found on the bank of the Trent, in North Lincolnshire, with a cross *potent fitchée*, and a beaded or "pearled" ornament similar to the example found in Garrick-street.

Two very beautiful brooches are shown, one of gold and enamel said to have been found in Scotland, the other in Thames-street, London. The workmanship and design are wonderfully delicate. There is also a brooch from Canosa, Southern Italy. Among the objects of simpler character are the bronze seal of Ethilwald, Bishop of Dunwich (c. A.D. 850), found at Eye, in Suffolk; a silver cross with a central blue stone surrounded by gold filigree, and a circular silver brooch (illustrated) with a marginal inscription, AELFGIVV ME AH (Aelfgifu owns me), the centre having a bird standing on a dragon. This was found in Kent, at Cuxstone, near Chatham, in 1822. A trial-piece of lead is also exhibited "on which the moneyer Ealdulf impressed his die for the silver penny of King Alfred"; this was found in St. Paul's Churchyard in 1841.

In another case are a great many Anglo-Saxon coins.

The MSS. include a very fine book of the gospels of early eleventh century date, with good illuminated letters.

In the illustrations given the rings, &c., are shown about their actual size.

THE BLUE COAT HOSPITAL COMPETITION, LIVERPOOL.

THE competition for the new Blue Coat Hospital at Liverpool has been conducted on somewhat different lines from those commonly adopted. No doubt the trustees decided that it should be limited to local architects, but to Mr. W. D. Caroë, who has throughout acted as the assessor, must be attributed the careful instructions which reduced the labour of the competing architects to the smallest possible amount. The competition was in two stages —preliminary and final. In the former the drawings were limited to a block plan (without drains) drawn to a scale of 32 ft. to an inch, and to plans of the several floors and a sufficient number of elevations and sections to explain the designs, drawn to 16-ft. scale. The drawings were to be in pencil, on drawing or tracing paper, tinted in a simple specified manner, and not mounted. Perspectives were expressly forbidden.

Twelve firms were asked to take part in the preliminary competition, and nine sets of designs were, we understand, received, from which the four best were, in accordance with the conditions, selected by the assessor. The authors of these were invited to take part in the final competition, but care was observed that the names of the authors of the respective designs were not made known either to the assessor or the trustees, nor were the designs of one architect shown to the other competitors, or to any one except those directly concerned in the conduct of the competition. Additional drawings were required in the second competition, but, with the exception of the detail drawings and the designs for the dining-hall, the original scales were adhered to. Each firm taking part in the final competition was promised a fee of 150*l.*, and in addition to this the authors of the successful design were to be appointed architects for the work and to be remunerated in accordance with the schedule of charges adopted by the Royal Institute of British Architects.

The four designs (numbered 1, 4, 5, and 9) received in the final competition were exhibited last week in the newsroom of the Liverpool Exchange, and we think that even the unsuccessful competitors will admit that the selected design is undoubtedly the best, both as regards plan and elevation. Mr. Caroë's report has not been published, but we understand that the design selected by the trustees for execution is that which he placed first. This is as it ought to be, and both Mr. Caroë and the trustees deserve the thanks of the competing architects for having conducted the competition so ably and honourably.

The existing hospital is set back from Lord-street, close to the cathedral, and is built in a simple type of English Renaissance around three sides of a forecourt, the two wings being connected by a wall and lofty railings with the entrance-gates in the middle. Competitors were informed that the trustees, "while not wishing to curb individual choice of style," were "desirous of recalling the architectural character of the front of the existing buildings." This desire has been borne in mind by all the four competitors, although with varying degrees of success, but only Messrs. Grayson & Ould have adopted the same type of plan as that of the existing hospital.

The accommodation required includes recreation-rooms and dormitories, together with all necessary conveniences, for 250 boys and 150 girls, classrooms for 300 boys and 200 girls, joiner's shop and cookery school (each for twenty-four scholars), rooms for the resident staff of masters, mistresses, and servants, common dining-hall, central hall with an area of not less than 3,600 square ft., kitchen department, gymnasium about 70 ft. by 35 ft., two lodges, clock tower, and a detached sanatorium with adjacent administrative block. The administrative department of the schools was to include an office and boardroom, ante-room for applicants and relatives, two small rooms for the medical examination of applicants, and a ladies' committee-room. A chapel to seat 800 and a swimming-bath 60 ft. by 30 ft. were to be shown on the drawings, but not included in the estimates. The cost, exclusive of the chapel and swimming-bath and of laying-out and fencing the grounds, was in the preliminary competition limited to 70,000*l.*, but this was increased in the final to 90,000*l.*

The new site is a large oblong, slightly wider at one end than the other. The long sides adjoin Prince Alfred-road on the west and Church-road on the east, and the ground rises from the latter to the former. Competitors were instructed that the main front must be towards Prince Alfred-road, but that the principal entrance might be in either road. This appears to have presented a difficulty. Church-road is by far the more important thoroughfare; it is wider than the other, and is also a tram-route, and would therefore appear to be the more convenient for the approach to the principal entrance. On the other hand, there is a large expanse of open ground on the opposite side of Prince Alfred-road, so that the buildings will be seen for a considerable distance on this side. The proper solution of the problem consists in giving to both fronts a satisfactory architectural treatment. Unfortunately for some of the competitors, they have been so concerned with the frontage to Prince Alfred-road that the Church-road front has been left to take care of itself, and, in one case at least, even the plan has been sacrificed to the dignified treatment of the principal front.

The successful design (No. 4) is by Messrs. Briggs & Wolstenholme, Hobbs and Arnold Thornely, who were recently successful in the competition for the great Liverpool Dock offices. In their design the buildings form a hollow rectangle, with the central area bisected by the central hall (under which is the dining-room). The buildings fronting Church-road consist in the main of one story and a basement, with the chapel at the extreme left, the gymnasium and swimming-bath at the extreme right, and the principal entrance and clock tower in the centre. The principal entrance is

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on the first or upper ground floor, and leads into a hall about 17 ft. square, above which rises the tower. A corridor 14 ft. wide leads directly from the entrance hall to the east end of the central hall, which is on the same level, and measures 76 ft. by 47 ft. exclusive of crush lobby and platform. The platform is at the west end of the hall and on each side of it a wide flight of eleven steps leads down to the level of the first or upper ground-floor corridors in the west block. Opposite these stairs are the two staircases (for girls and boys respectively) leading down to the lower ground floor and up to the second floor of the west block fronting Prince Alfred-road. This block is three stories high, and contains on the lower ground floor the four classrooms for girls and the boys' recreation-rooms; over the girls' classrooms are the matron's and headmaster's rooms, sewing-room, &c., on the first floor, and one of the girls' dormitories on the second floor. Over the boys' recreation-room are two stories of boys' dormitories. The girls' recreation-rooms are on the lower ground floor in the south range of buildings, and girls' dormitories and other rooms are placed on the floors above. The six boys' classrooms are on the lower ground floor in the north range, but overlooking the "male staff quadrangle" so as to have a south aspect. This quadrangle measures 169 ft. by 96 ft., and is therefore of ample size. The corresponding quadrangle on the opposite side of the central hall is divided into two unequal parts by a one-story range of buildings (parallel with the two principal fronts), the larger part forming the female staff quadrangle and the smaller the kitchen court, from which access is obtained to the kitchen department, a one-story block between the dining-room and the basement under the principal entrance.

The block fronting Church-road has a corridor 9 ft. wide running from the chapel on the left to the galleries of the gymnasium and swimming-bath on the right. The frontage is occupied towards the left of the entrance by the boardroom, medical examination-rooms, applicants' ante-room, girls' and applicants' entrance, and the chapel; and towards the right of the entrance by the office, ladies' committee-room, boys' entrance, gymnasium, and swimming-bath. The two portions are not symmetrical and the effect will be less satisfactory in perspective than in elevation.

The sanatorium is a detached two-storied building fronting Church-road, to the north of the swimming-bath. It is well planned and is raised on a terrace behind which is the playing-field. This is only two acres in extent, but can easily be increased by omitting an unnecessary cloister which runs from east to west at a distance of about 36 ft. from the north front of the main buildings.

The chapel is a circular building, with four projecting arms, forming a cross. The north arm forms the entrance, the south is occupied by the organ, and galleries are placed in the two transepts. The central area is covered by a low dome, and the building is well designed both for internal and external effect. A flight of stairs close to one corner of the chapel leads down to the lower ground floor, near the girls recreation rooms, and the approach for the boys is along the main corridor on the upper ground floor, so that the boys and girls cannot meet till they reach the vestibule of the chapel. This is a point which has been overlooked by some of the other competitors. Speaking generally, the planning of this design is admirable. The architectural treatment of the chapel and tower is also excellent, but more character might, with advantage, be given to the Prince Alfred-road front. Both as regards plan and style it is undoubtedly the best of the four designs.

Design No. 1, by Messrs. Woolfall & Eccles, has the principal entrance in Prince Alfred-road, the main block being set back so that the sanatorium and chapel can be placed in front of it. The dining-room is in the middle of the main building and on the same level as the entrance, and is approached through an inner hall and corridor. The kitchen department is in the rear of the dining-room, and is connected to it by a service corridor. The boardroom, office, &c., are near the principal entrance. The girls' and boys' schools form on the ground floor two complete quadrangles to the north and south respectively of the central block, and are connected with it by a corridor running right and left from the back of the inner hall. The ground floors of the schools are ten steps above the dining-room, principal entrance and administrative rooms; this arrangement, while giving the necessary increase of height to the dining-room, allows the first floor, including the central hall over the dining-room, to be on one level. The two quadrangles are of large size and are used as playgrounds, and covered playgrounds are shown on the sides forming the ends of the whole group. The gymnasium is placed over the boys' covered playground, and is therefore as far from the girls' school as possible; this is surely one of the rooms which ought to have been conveniently accessible from both schools. The swimming-bath is also too far from the girls' school. In both schools the classrooms are on the east side of the quadrangles, and therefore in the Church-road front, and the recreation-rooms on the west side, and therefore in the Prince Alfred-road front; the lavatories and wardrobes are on the sides nearest the central block. The classrooms are rather too far from the recreation-rooms.

There are many good points about the planning of the main buildings. The arrangement of the rooms on the two sides of the central block is practically symmetrical, and the general grouping of the rooms can be easily grasped, but the buildings are lacking in compactness. The sanatorium is the most unsatisfactory feature. It is placed in the north-west corner with one end towards Prince Alfred-road, and has two wings (in which the conveniences are placed) projecting northwards from the rear; the administrative block is wedged between the wings, leaving a space of only 13 ft. at each end of the block and of only 10 ft. between the block and the sanatorium itself. The principal frontage of the administrative building is towards the north, so that altogether this building would be very dreary, and would also render the sanatorium far from satisfactory. The playing-field is L-shaped, and therefore contrary to the instructions. On the whole, however, the planning is good and next in merit to that of the selected design.

The external treatment is somewhat bald and uninteresting. The upper dormitories are lighted on the fronts by circular windows 3 ft. 6 in. in diameter, and the effect would have been greatly improved if the main cornice had been placed below those windows. At the same time it must be confessed that such windows are, for sanitary reasons, unsuitable for dormitories. The Church-road frontage is not satisfactory, and would be still worse if the swimming-bath were erected in the position shown.

Messrs. Grayson & Ould, in design No. 5, have sacrificed too much for the sake of the Prince Alfred-road frontage. If the details had been as good as the general conception, this frontage would have been the best submitted. As already stated, the authors have taken their cue from the existing hospital, and have arranged the front portion of the buildings around three sides of a large forecourt. The dining-room and the central hall over it are placed lengthways to form a central projection in the recessed portion. At each corner of the projection there is a large bay, rather more than semi-octagonal in plan, rising nearly to the main cornice. This central feature is perhaps the best part of the design, although the flat roofs of the bays are far from happy. The girls' school is in the north part of the recessed portion and in the north wing, and the boys' school in the south. An ornamental garden extends from the road to the dining-room, and access to the garden is obtained by a door (without vestibule or porch) in the centre of the dining-room front and a flight of ten steps. The playgrounds are to the right and left of the garden.

The principal entrance, if such it can be called, is in the Church-road front, and from it access is obtained to the central hall over the dining-room by means of a corridor about 140 ft. long and for the most part 6 ft. wide, in which occur three flights of stairs, having seven, five, and four steps respectively. This alone is sufficient to throw the design out of court, but it is not by any means the only defect. To reach the chapel without leaving the building, the girls must go through the dining-room (or along the service corridor), and then along the boys' corridor, past two boys' recreation-rooms, boys' lavatory, three boys' classrooms, and the boys' workshop. To reach the gymnasium and swimming-bath, both boys and girls must apparently travel along the service corridor past the kitchen and pantry doors. The dormitories have three rows of beds. The sanatorium is badly designed, the very elements of hospital planning being ignored.

The arrangement of the Prince Alfred-road frontage was undoubtedly a happy idea, but unfortunately it has been allowed to spoil the other parts of the building.

Messrs. Richard Holt and J. B. Hikins have undoubtedly produced a striking design (No. 9). Both the main frontages have been duly considered, and both would be effective, although the architectural details are chiefly either crude or commonplace. The authors certainly have eyes for planning a large building like this in a monumental way. The principal elevation is towards Prince Alfred-road, and has a forecourt in the middle; a lodge is placed in the middle of the front of the forecourt, and is connected to each wing portion of the building by a colonnade. At the back of the forecourt three entrances lead into a corridor or loggia, behind which the dining-room is placed. The Church-road frontage has the chapel for central feature, and around this an elaborate semi-oval drive and cloister leads (alas! that we should have to say it) to the kitchen vanyard. This grand entrance is at the vertex of the curve; the girls' and boys' entrances are on either hand. Beyond the north cloister entrance is the administrative block of the sanatorium, and this is balanced on the south by the boardroom and office building.

The general planning is, however, less satisfactory. In addition to the forecourt there are two quadrangles used as playgrounds, four smaller courts, and three areas for light. The corridors are not well designed. The different parts of the main building are fairly connected on the lower ground floor (to a great extent by cloisters), but on the upper ground floor there are practically ten disconnected buildings in addition to the tower. This renders it necessary to provide a great number of staircases. On the upper ground floor plan we counted twenty flights, besides emergency stairs. The classrooms are on the upper ground floor, as are some of the dormitories, while the recreation-rooms are on the floor below. It would be an exceedingly difficult task for the masters to supervise such a building and for the servants to attend to it. The dormitories have three rows of beds, and some of the recreation-rooms are L-shaped. Only one lodge is provided, and the central hall is rather too small. To get over the difficulty of placing a single gymnasium in a convenient position for both boys and girls, the authors have provided one for each sex. The instructions, therefore, have not been completely carried out.

As regards cost, this design would undoubtedly be the most expensive and would certainly exceed the stipulated sum. Messrs. Grayson & Ould's design would be the cheapest, while the selected design would probably come next. In conclusion, we may state that the order of merit of the unsuccessful designs has not been given to the public. Perhaps, as the premiums are equal, the assessor did not consider it necessary to state his opinion as to their relative merits.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following have passed in the Royal Institute of British Architects June examinations:—

Preliminary.

W. H. Bagot, Aldgate, South Australia; A. F. Benjamin, London; P. U. Billings, Sale; S. Birkett, West Didsbury, Manchester; A. Booth, Barnsley; H. L. Bown, Harrogate; A. G. Bray, Bolton; T. H. Brook, Holmfirth, near Huddersfield; F. H. Bulmer, Woolwich; J. H. R. Burbage, Southampton; M. J. Burke, Dolphin's Barn, Dublin; H. Cartwright, East Finchley; A. Chamberlain, Newcastle-on-Tyne; J. H. Chaundler, Eastbourne; R. H. Cheatle, Burford, Oxon; H. Clay, Gainsborough; W. Clifford-Smith, Poole; W. Clissold, Edgehill, Minchinhampton; G. B. Cobbett, Addlestone; A. F. Collins, Windsor; C. S. Cooper, Gainsborough; H. R. Crabb, Exeter; N. Culley, Huddersfield; R. B. Curwen, South Woodford; J. L. S. Dahl, Liverpool; G. V. Davidson, Paisley; V. A. G. Day, Old Aberdeen; N. A. Dick, Edinburgh; H. E Dicks, Cheltenham; E. J. Dod, Birkdale, Southport; R. Donnelly, Holywood, co. Down;

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H. B. Downs, Guiseley; A. McLachlan Duncan, Perth; C. C. Durston, Weston-super-Mare; C. W. Eaton, Leicester; S. A. Edwards, Manor Park, Essex; T. M. Ellis, Hull; L. S. Fifoot, Penarth, Cardiff; G. McL. Gibson, Hornsea; C. L. Gill, London; J. H. Gott, Margate; G. H. B. Gould, Ipswich; R. F. Gutteridge, Southampton; G. I. Gwynne, Boscombe, Hants; S. A. Hall, Muswell Hill, N.; J. T. Halliday, Stonehouse, Plymouth; F. J. W. Hart, Brondesbury, N.W.; R. E. Hastewell, Haltwhistle; F. R. Hedges, Wisbech; H. W. Higson, Smithills, Bolton; S. W. Hill, London; H. D. Hird, Halifax; W. A. Hodges, Wimbledon Park; H. D. Holland, Pemberton, near Wigan; A. P. Holmfeldt, Hull; H. G. Holt, Bolton; R. M. F. Huddart, Bayswater; R. C. Hunter, Edinburgh; W. S. Iron, Clapton, N.E.; W. Jackson, Hitchin; S. Jaques, Stratford, E.; D. S. Jennings, Hammersmith; W. H. Johnson, Great Yarmouth; F. H. Jones, Leicester; P. C. Jones, Leicester; W. J. Joynes, Bristol; T. Rosenheim Kerr, Inverness; H. P. Keys, Wood Green, N.; T. W. F. Körner, Sunderland; A. P. Lambert, Brixton, S.W.; C. S. Langham, Leicester; A. H. Le Gassie, Plympton; H. R. Linnell, Leyton; J. W. Lloyd, Taunton; A. G. Lynham, Bristol; D. A. Macdonald, Muir of Ord, Ross-shire; A. C. Mac George, Westbourne Park, W.; A. L. Macmillan, Southport; E. J. Mac Rae, Edinburgh; F. Marshall, Stockport; J. Matley, Oldham, D. Mitchell, London; J. Mitchell, Edinburgh; W. H. Mitchell, Sale, Manchester; G. Morland, Croydon; H. S. Morran, Plumstead, Kent; G. C. Murray, Stoke, Devonport; R. H. Murray, Norbury; P. G. Newton, Kingstown, co. Dublin; J. H. Noël, Wakefield; V. J. O'Connell, Dublin; W. Paice, jun., Egham; E. W. Pearson, Bradford; E. S. Petch, Wakefield; R. A. H. Phipp, Rowde, Devizes; C. R. Pinsent, London; R. R. Prentice, London; E. L. Pryor, London; A. Pursglove, Heaton Moor, near Stockport; H. T. Rainger, Cheltenham; J. B. T. Reid, Dalmarnock, Glasgow; A. Rigby, Manchester; K. D. S. Robinson, London; C. K. Roe, London; P. J. Rowe, Marlow-on-Thames; F. S. M. Saunders, London; A. T. Scrivener, Endon, Stoke-on-Trent; J. Smith, Alnwick; W. J. Smith, Richmond; A. L. Snow, Chislehurst; W. J. Stenner, Bristol; A. W. Street, Birkenhead; A. D. Sturgess, London; C. N. Taylor, Prestwich Park, near Manchester; C.S.Thomas, Forestpach, Swansea; H. Thomas, Swansea; P. E. Thomas, Penarth; J. O. Thompson, Poppleton, near York; R. W. Thorp, Headingley, near Leeds; C. Thunder, London; W. I. Travers, London; C. A. S. Vardy, Maidenhead; N. Vaux, Sydenham; E. A. J. A. Vincent, Chertsey; A. Wagstaff, Glasgow; E. G. Walker, Upper Norwood, S.E.; F. H. Walker, Windermere; W. B. Walton, Blackpool; F. H. Webster, Norwich; J. G. West, Cardiff; E. L Wilson, Southport; G. A. Wood, Girlington, Bradford; R. S. Woodcock, Aldeburgh-on-Sea; E. L. Wren, Leicester.

Intermediate.

The following have passed the Intermediate Examination, the names being given in order of merit as placed by the Board of Examiners:—P. B. Dannatt; J. S. Brocklesby; Baxter Greig; E. G. H. Gunn; A. G. Maitland, Tain, N.B.; W. Greenwood, Blackburn; J. H. Belfrage; R. T. Longden, Burslem; E. P. Archer; Edgar Quiggin, Liverpool; Herbert Ryle, Newcastle-on-Tyne; C. F. Callow, St. Leonard's-on-Sea; Herbert Black; T. F. Amery, Sheffield; W. E A. Brown; J. A. Fletcher, Leicester; W. J. Delbridge; Sydney Bridges; H. P. Gordon; H. E. Rider; G. E. Elkington; Richard Wylie, Gateshead; G. M. Page, Lincoln; H. M. Pritchard, Cardiff; J. O. Raymond, Tring; G. S. Salomons, Manchester; Jordan Green, Birmingham; F. G. Newton; F. J. Toop, Lincoln; W. E. Brooks; H. Dru Drury; E. H. Walker; F. J. Lucas; R. J. Archibald, York; A. F. Warth, Birmingham; W. P. Watson, Coventry; J. A. Hossack, Banff, N.B.; A. N. Campbell; Joseph Boyle, Bolton; H. F. Buckley, Halifax; F. J. A. Corfield; Bertram Drummond, Fleetwood; E. F. M. Elms; F. J. Forster, Darlington; E. T. Goff, Lowestoft; L. A. Loades, Morpeth; H. J. Mauchip, Bristol; Stanlev Salisbury, Harpenden; J. H. Shearer, Exeter; W. H. Watkins, Bristol.

The Final.

The following have passed the Final Examination, qualifying for Associate R.I.B.A.:—

John Percival Bishop, London; W. Mackereth Dean, Gravesend; Lionel Gordon Detmar, London; Leonard W. Ensor, Huddersfield; C. H. Gage, London; Leolin C. Gregory, London; John Percy Hall, London; Sidney Joseph Halse, London; Alex. G. R. Mackenzie, Aberdeen; Clement Stretton, Leicester; Edgar John Pullar, London; Raymond Cyril Wrinch, Ipswich; F. Dare Clapham, London; W. Bruce Dawson, London; Ernest Godfrey Page, London; Cyril E. Power, London; T. Wilson Aldwinckle, London; C. H. E. Bridgen, London; Dean John Brundrit, Cheshire; H. Cayley, Cambridge; H. D. Day, Godalming; T. Norman Dinwiddy, Greenwich; K. Gammell, London; G. R. C. Harding, London; C. Llewellyn Hall, Lancashire; Abraham Holstead, Alnwick; E. Vincent King, South Shields; Arthur Pickup, Blackburn; Louis E. Pryke, Surbiton; Arthur Henry Roe, London; R. Bertie Rowell, London; John G. Walker, Wakefield.

THE ARCHITECTURAL ASSOCIATION.

THE Architectural Association Travelling Studentship has been awarded to Mr. J. E. Forbes; Mr. L. G. Detmar receiving the second prize, value 5*l*.

The work executed in the School of Design and the Studio during the past Session will be exhibited at 56, Great Marlborough-street, W., from August 1 to August 10 (inclusive) between the hours of 9 30 a.m. and 7 p.m. (Saturdays, 1 p.m.).

So many members and non-members have, during the past few months, applied to the Secretary requesting his assistance in obtaining introductions to others desirous of sharing or letting offices, requiring pupils, partnerships, mutual assistance in return for share of offices, &c., that it became necessary for the Committee to consider the advisability of making a charge for these special services. The Committee has therefore resolved to establish a new Register for such purposes, for which a fee of 10s. 6d. and 21s. will in future be charged to members and non-members respectively.

The alterations which have been in progress for some time at 56, Great Marlborough-street, are completed, and the new common room is now open to members. The alterations have been carried out by Messrs. Shuffrey & Co., under the supervision of the President. The common room, office, and library will now be lighted by electric light.

The late President, Mr. George H. Fellowes Prynne, has consented to carry on his editorship of the "Association Notes" for another year. Mr. Satchell is the sub-editor.

The annual excursion will take place this year from July 22 to 27, and hotel accommodation having been found, the headquarters are now fixed at Cirencester. Most of the visits are now arranged, and include the following:—Northleach, Stowell Park, Chedworth, with its Roman Villa and Museum, Edgeworth Manor, Wishanger Manor, Lypiatt Park, Doughton, Malmesbury Abbey and Town, Charlton Park, Beverstone Castle, Chavenage, Tetbury Town, with its quaint Market Hall and old houses, Bibury Court, Ablington Manor, and other places in the vicinity. Intending excursionists should send in their names to either of the hon. secs., Mr. W. Talbot Brown, The Square, Wellingborough; or Mr. A. W. Hennings, 9, Ely-place, E.C.

COMPETITIONS.

SCHOOLS, ALDERSHOT.—The First Premiated Design in this competition was sent in by Messrs. Coggin & Wallis, 15, York-buildings, Adelphi.

QUARRYOWNERS' ASSOCIATION.—The annual general meeting of the United Kingdom Granite and Whinstone Quarryowners' Association has just been held in Aberdeen, under the presidency of Mr. A. F. Manuelle, of London, Leicester, Guernsey, and Aberdeen. The accounts for the year showed a very favourable balance. Mr. Manuelle was re-elected President, and Mr. John Fyfe, quarryowner, Kemnay, &c., as vice-president. After lunch in the Imperial Hotel, Rubislaw Quarries, the Aberdeen Granite Works (Constitution-street), the new electric tramway to the Links, and the Corporation's sea-bathing station were visited and inspected with interest. On the second day the members had an excursion to Balmoral Castle, and dined together in the Invercauld Arms Hotel, Ballater, those from a distance leaving Aberdeen next morning for their homes.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

THE annual meeting of the members of the Association of Municipal and County Engineers was held in the Council Chamber of the Town Hall, Leicester, on Thursday, June 27. Mr. B. G. Mawbey, President, occupied the chair, and among those present were Messrs. C. H. Lowe, Hampstead; J. P. Barber, Islington; W. Weaver, Kensington; W. N. Blair, St. Pancras; J. M. Knight, Mile End; J. P. Norrington, Westminster; O. E. Winter, Poplar; J. E. Willcox, Birmingham; J. Price, Birmingham; J. T. Eayes, Birmingham; J. Lobley, Hanley; J. Lemon, Southampton; F. J. C. May, Brighton; E. R. S. Escott, Halifax; A. M. Fowler, Westminster; A. E. Collins, Norwich; A. Creer, York; A. T. Davis, Shrewsbury; A. D. Greatorex, West Bromwich; E. P. Hooley, Nottingham; J. Paton, Plymouth; S. S. Platt, Rochdale; C. F. Wike, Sheffield; R. J. Thomas, Aylesbury; J. S. Pickering, Nuneaton; J. Hall, Cheltenham; T. Cole (Secretary), Westminster; and others.

The inaugural address of the President (Mr. E. G. Mawbey) appeared in our issue of last week. In continuation of the report of the proceedings,

Mr. W. Howard Smith, Assoc.M.Inst.C.E., Westminster, read a paper on "Permanent Way for Electric Tramways." He contended that a well-designed track which was the outcome of practical experience would probably have a life double or treble that of one badly conceived. Each year added to the life meant not only a saving of the proportion of capital cost and interest thereon, but also the postponement of the inevitable loss of revenue during reconstruction; every possible means should therefore be taken, at reasonable expense, to ensure that the permanent way should be perfect in design and construction, and its standard of stability of the highest. Though the experience in this country of the wearing effect of electric traction on tramways had been comparatively short, it had been sufficient conclusively to demonstrate that it was much more exacting in its demands for perfection of permanent way than was found necessary under horse, cable, or steam traction. This was primarily due to heavier cars being run at much faster speeds and with much greater frequency. A loaded electric car weighed from 10 to 12 tons as against 3 to 4 tons for a horse or cable car, while the maximum speed was generally fixed at eight miles per hour on urban and suburban roads, and fifteen miles per hour on inter-urban lines.

Mr. A. D. Greatorex, West Bromwich, moved a vote of thanks to the author of the paper.

Mr. A. H. Campbell, East Ham, suggested that the Association should endeavour to obtain a practical result by being represented before the Standards Committee as to the adoption of a standard rail. If a standard rail could be adopted in this country, it would prove of great economy in tramway construction.

Mr. S. S. Platt, Rochdale, referring to the absence of fishplates on the Blackpool tramways, said he did not know whether that had had anything to do with the trouble met with there. He would certainly hesitate to dispense with fishplates.

Mr. Blair, St. Pancras, condemned the use of chilled iron blocks to prevent rutting by the side of the tram track. These blocks wore at a less rapid rate than either wood or granite, and gave out a continuous clatter, so much so that the Tramways Committee in his district called upon the Tramways Company to withdraw them.

After some further discussion, the vote of thanks was accorded, and Mr. Howard Smith briefly replied to questions put by the various speakers.

Mr. E. Manville, London, then read a paper on "Methods of Safety for the Overhead Electric Trolley System." He said it was most important that the overhead trolley system, when installed, should be of such solid construction and excellence of design that with a comparatively limited amount of inspection there should be the smallest possible liability to breakage of the "live" conductors, or of parts carrying these, and of the entanglement of the trolley wheel with the "live" conductor, the guard wires, and their fittings. It was originally the custom to use 1/0 B. & S. trolley wire of hard copper, but the numerous accidents occurring from the use of so small a wire had gradually caused the

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introduction of larger sizes of trolley wire having a higher breaking strength. In other respects the installations had been strengthened with a view to eliminating as far as possible the chances of accident.

Mr. J. Lemon, Southampton, moved a vote of thanks to the author of the paper.

Mr. J. Lobley, Hanley, who seconded, remarked upon the unanimity with which the overhead system was now accepted in this country.

Mr. Gammage, Dudley, said though the public of his borough were up in arms against the overhead system when it was proposed, since it had been working there had not been a single accident and the public were quite satisfied.

Mr. Manville, in reply, said he did not think there was any difference in the way of safety between the span-wire and bracket systems; both were equally safe, but the span-wire system was the best in working because it formed the easiest passage for the trolley wheel to pass over.

Mr. W. Worby Beaumont, M.Inst.C.E., London, then read a paper on "The Wear of Roads by Horse Haulage and Motor Traffic." He urged that good roads and ample means of easy and quick transport upon them were among the first of all necessities. To gain anything like a true knowledge of the effect of the average bad road surface in the destruction of vehicles, it was only necessary to take a run in a light motor carriage with 30-in. wheels and solid rubber tyres at twelve miles an hour. It might be just possible to retain one's dental integrity at that speed, but at anything like a sufficient speed to avoid a charge of wasting time on the road it would be necessary to have spine and teeth of indiarubber. A motor carriage made an excellent road inspector. It experienced all the badness, and said nothing. They must have better roads for the high speeds that modern lines demanded; more men and more money at the disposal of engineers and surveyors. Considering the lighter class of motor vehicles, such as those which carried from one to two tons, at speeds which meet modern requirements, it might be confidently expected that the wear of the roads by them would be from 20 to 40 per cent. less than by horse-hauled vehicles, and that it would, therefore, pay to spend more money at first in following out the best possible construction, and afterwards in maintaining a trained body of repairers constantly at work, so that these vehicles might be profitably used.

Mr. R. J. Thomas, Aylesbury, who proposed a vote of thanks to the author, contested what he described as the prevailing impression that nothing had been done to improve the roads.

Mr. McBair, Lincoln, who seconded, considered that rubber-tyred motor cycles had the effect of disintegrating macadam roads, and he would be very glad to see them taken off the roads altogether.

Mr. Norrington, Westminster, contended that in London wood paving was allowed to go for years without any repair, and then the whole road had to be taken up and relaid.

Mr. E. P. Hooley, Nottingham, said he had never heard a more ridiculous statement than that the Local Authorities cut down their expenditure on the roads without consideration of the condition of the roads.

Mr. J. P. Barber, Islington, said they were unable in many cases to get men to repair their roads with skill and intelligence. He had the greatest difficulty in selecting six men from 200 who could spread a single load of broken stone efficiently and economically. They seemed to get men in London who had failed at nearly everything else, and who thought all they had to do was to help the surveyor to do his work. He hoped Mr. Beaumont would not go away thinking there was no one there who did not lament the decadence of the skill and intelligence of the workman.

Mr. Paton, Plymouth, considered that the bad condition of macadam roads in London was due to indiarubber-tyred vehicles, which tended to disintegrate macadam. The roads were in better condition than ever before.

The vote of thanks having been passed,

Mr. Beaumont, in reply, said if ever it was known how to make a road, and to maintain it, it was to-day; but it required men and money to carry out their knowledge, and that was what they had not got for 60 per cent. of the whole of the roads of the country.

Mr. T. H. Yabbicom, C.E., Bristol, read a paper entitled "Notes of Experiments made on the Purification of Sewage by means of Stoddart's Improved Sewage Filter at Knowle, Bristol." He explained that the sewage was dealt with in a covered tank and a filter having a depth of 6 ft. made of rough clinkers of not less than 2½ in. gauge. The tank effluent was distributed over the surface of the clinker by a contrivance invented by Mr. Stoddart, which was described by the inventor as follows:—

"The distributor consists of a number of narrow gutters arranged at right angles to the supply channel, and resting upon its margin and upon suitable support at the distant end. Each section of the distributor abuts against a casting embedded in the margin of the supply channel, so arranged that the tank effluent, on flowing over the margins of the channels, passes into the gutters of the distributor. Along the lowest part of the under surface of each gutter is placed a series of vertical points.

The sewage or tank effluent, entering the gutters by way of the supply channel, flows over the margins, and on reaching the under surface, falls from each of the vertical points in a series of fine drops.

It will be seen that there are no fine perforations to become clogged, and that the action of the distributor does not in the least depend upon the subdivision of the sewage by fine apertures or tubes, but that there is a perfectly free passage for the sewage from the supply channel to the filter itself. There are also no moving parts, or indeed anything that by any stretch of the imagination can be considered likely to get out of order."

Mr. Lacey, Oswestry, moved a vote of thanks to the author for his paper.

Mr. W. J. Dibdin, London, said he did not wish to speak in criticism, but the filter appeared to him to all intents and purposes to be absolutely identical with Colonel Ducat's filter. Colonel Ducat had a bed of filtering material 10 ft. deep, and he had a number of methods of distributing the sewage on to the bed by perforated pipes, V-shaped troughs, and so on, and wherein this constituted a difference from Colonel Ducat's method he would like to have explained. The results obtained by the Stoddart method seemed to have been good, but not remarkable.

Mr. Yabbicom, in reply, said he was not there as an advocate, but Mr. Dibdin could not expect him to give Mr. Stoddart away by admitting that this filter was precisely the same as any other filter.

The meeting then became special to consider proposed alterations in the by-laws of the Association, which were considered in private.

In the evening the annual dinner of the Association was held in the Mayor's room at the museum, the President (Mr. Mawbey) presiding over a large company.

The proceedings of the annual meeting were resumed in the Council Chamber of the Town Hall on Friday, June 28, Mr. Mawbey in the chair.

A paper on rifle ranges by Mr. J. W. Bradley, City Engineer of Westminster, in the absence of the author, was taken as read.

Mr. E. P. Hooley, Nottingham, proposed a vote of thanks to Mr. Bradley for his paper, though he thought it more a matter for the consideration of the House of Commons than for that Association.

Mr. A. D. Greatorex, West Bromwich, seconded the vote of thanks.

Mr. W. J. Dibdin, London, suggested that landowners might assist in this matter by giving permission to Volunteers to shoot over their land.

Mr. F. W. Mager, Walsall, read a paper on "The Liabilities of Local Authorities under 38 & 39 Vict., cap. 55, sec. 24."

On the proposition of Mr. A. Collins, a hearty vote of thanks was accorded to the author for his paper.

The members then proceeded in brakes to visit the Nedham-street refuse destructor and the West Humberstone destructor and steam-raising plant, after which they proceeded in a special train to Loughborough to inspect the extensive Falcon Works of the Brush Electrical Engineering Company, Limited. The whole of the workshops were thrown open to the inspection of the members, who, before leaving, were entertained to luncheon by the company. The remainder of the day was devoted to visits to Messrs. J. Ellis & Sons, Limited, Portland Cement Works, the Mountsorrel Granite Quarries, and the Groby Granite Quarries, and Patent Victoria Stone Works.

The proceedings of Saturday, June 29, were devoted to a motor-car journey, on cars kindly provided by the members of the Automobile Club of Great Britain and Ireland, and its Nottingham and Midland branches, to visit the various improvements in the Borough of Leicester, the Beaumont Leys Sewage Farm and Experimental Works, the Enderby and Stoney Stanton Granite Company's quarries, where luncheon was provided, and the Croft Granite Company's Works. The journey was a most enjoyable one, beside affording a very severe test of the travelling capacity of the cars, an ordeal which they came through very successfully. The complete enjoyment of the day was marred by an accident, which occurred late in the afternoon to one of the cars, and by which two members of the Association received slight injuries. Apart from this the meeting was one of the most successful in the annals of the Association.

GLASGOW ROYAL INFIRMARY RECONSTRUCTION SCHEME.

THE Glasgow Institute of Architects have written and circulated the following letter addressed to the Executive of Contributors to the Infirmary Reconstruction Scheme:—

"115, St. Vincent-street,
Glasgow, June 25, 1901.

To the Executive Committee of the Contributors to the Royal Infirmary Reconstruction Scheme.

GENTLEMEN,—I duly received your letter of 18th ult., which has already been acknowledged, and I am instructed to state that the Glasgow Institute of Architects regrets that no more explicit reply has been vouchsafed to its protest and appeal, by the Managers and the Executive, than what is contained in the official statement issued to the public. Nothing in that statement in any way answers or refutes the objections previously raised by the Institute. The statement, indeed, rather confirms them; and the Institute therefore remains of the opinion that the plans as adopted 'are in many vital particulars inadequate and out of date;' that their distribution on the site, particularly with regard to the 'Jubilee Block,' facing Cathedral-square, is bad; and that in consequence, if the reconstruction is proceeded with according to those plans, 'the infirmary will not conform to the most modern standards of design in this class of building.'

The criticisms of the Institute on the previous occasion were chiefly concerned with (1) the manner in which the competition was conducted, according to which solutions of the problem other than those put forward by the Managers did not receive unbiassed and adequate consideration; and (2) the insistence on the Jubilee Block as an integral part of the scheme. Such a block the Institute considered to be objectionable, because (*a*) it would shut out from the rest of the buildings the sun and air from the southern and most open part of the surrounding area, and (*b*) it would dwarf and irretrievably injure the external appearance of the cathedral.

With regard to the first of these two points, while the Managers in their letter refer to the block-plans which they had prepared with much time and labour as being 'suggestive and illustrative only,' and this is repeated in the statement and appeal of the Executive, one learns also from this latter that when the final selection was made the Executive Committee fixed on a plan which the assessor reported as being one of two which most closely conformed to the sketch-plans'—*i.e.*, those drawn up by the Managers. As further reason for the adoption of this particular plan the Executive give a list of special characteristics in respect to internal arrangements which they consider to be essential or desirable features; yet these were all contained in other designs submitted, which were at the same time free from the radical defects referred to.

As to the Jubilee Block, the Managers now state as their sixth conclusion:—'That the new hospital, and not a section of it, should be regarded as alone worthy of the City of Glasgow, and as a fitting memorial to the sixty-three years' illustrious reign of the Queen.' This is exactly the position adopted by several of the competitors and by the Institute, while objecting, from practical reasons already stated, to its inclusion as part of the scheme. With reference to the cathedral, it is, therefore, quite beside the point for the Executive to state that 'the buildings must be lofty if the hospital requirements of the public are to be adequately met,' for, while the buildings must be lofty, on other portions of the site (if that site is to be retained) there is no necessity for their being lofty in the direct alignment with the cathedral, nor, indeed, for there being any buildings at this point at all, as was shown in one or more of the plans submitted. The Institute does not admit that the injury to the cathedral is a question of architectural style; it is one of comparative height and scale. As regards these, the plan adopted is especially objectionable in that not only is the block itself seven stories high, but it has in addition a lofty spire which would further and quite unnecessarily

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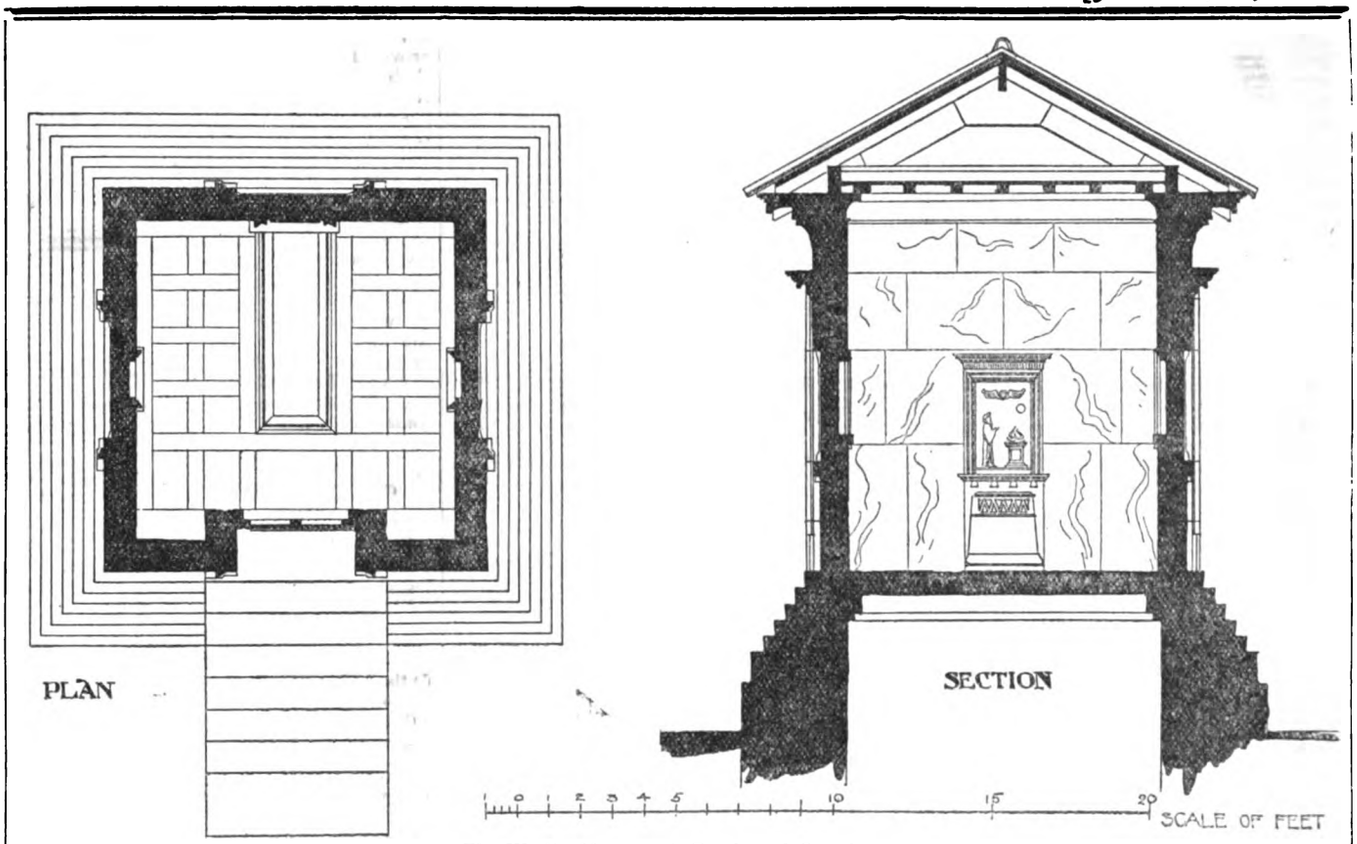

The Wadia Monument, Brookwood Cemetery.

assist to dominate and destroy the effect of the cathedral.

The Institute of Architects feel it to be their duty, in the interests of the public (for whom they speak as a body of technical experts in such matters), to thus repeat and emphasise their protest, and to again most earnestly urge the Executive, before committing themselves and the public to the erection of any portion of the building, as designed, to have the plans submitted to one or more independent hospital authorities of recognised and outstanding position for consideration and report. Further, should the Executive object to the outlay involved in such a course, the Institute would be prepared to arrange for it and to meet the cost provided the Report did not bear out their contention, while submitting beforehand the name or names of the experts proposed, on obtaining the necessary facilities from the Executive.—Yours truly, C. J. MACLEAN, Secretary."

Illustrations.

PULPIT, SAN MINIATO, FLORENCE.

THE pulpit and the screen that supports it on one side are beautiful examples of Romanesque workmanship in inlaid marble. The devices of men and winged monsters on the screen, and the short squat figure with the eagle supporting the lectern, add a touch of quaintness to the design.

The whole is in a fair state of preservation, nothing being damaged but the capitals of the slender columns and the mouldings here and there. The rude way in which the pulpit butts into the columns of the choir suggests that it was not originally intended for its present position, but of this there is no certainty.

The drawing was made entirely upon the spot. W. CURTIS GREEN.

THE WADIA MONUMENT, BROOKWOOD.

THE Wadia Monument has been erected at Brookwood, on the land used as the Parsee burying place, as the tomb of Mr. N. N. Wadia, a Persian gentleman who lived in Bombay as a subject of the Indian Empire, but who died in England. The tomb is the design of Mr. T. E. Collcutt.

It is built of Portland stone, the roof being covered with blue ribbed glazed tiles. The door is of teak covered with plates of bronze, and bronze panels with inscriptions are set into the recesses on each side of the building. The interior is lined with a dado of Verona marble, the upper part of the walls being covered with alabaster. The ceiling is divided by teak beams, which are gilded, the panels being coloured a pale blue.

The sarcophagus is constructed of alabaster inlaid with red and green marbles and lapis lazuli, the top having a band of carving in low relief, with the crest of the late Mr. Wadia—a separate panel.

The ruins of the tomb of Cyrus at Passargardæ, illustrated in the volume on Persian art, by Messrs. Perrot and Chipiez, have been followed so far as the general outline of the building would admit.

The beautifully worded inscriptions on the outside of the building were composed by Sir George Birdwood, and can be read on the reproductions in our plate, from photographs taken from the bronze plates before fixing. The lithograph shows a view of the tomb, from a perspective sketch lent by the architect. The plan and section are given in the text.

RAYNHAM HALL, NORFOLK.

THE two detail elevations of this house, the design of which is attributed, with every probability, to Inigo Jones, are reduced reproductions of two plates in Mr. Triggs' and Mr. Tanner's new illustrative volume of "Some Architectural Works of Inigo Jones," to which more special reference is made in the first article in this issue.

MAP OF THE PARISH OF ST. GEORGE, HANOVER-SQUARE.

THIS, as stated on the title of the plate, is a reduction from an old map in the possession of St. George's Vestry, and is given in connexion with the article published in this issue on the Grosvenor Estate, Pimlico, &c., and shows the state of the district as it still existed, for the most part, at the commencement of the nineteenth century.

The proper scale for the reproduction is that outside the border, which has been reduced with it; the inscriptions on the old scales inside the border—"scale of 165 ft. to an inch" &c., are of course incorrect in this reduced form.

OLD SITES AND BUILDINGS, ST. JAMES'S PARK AND PIMLICO.

THESE views, reproduced from drawings in the Crace collection, are also given in illustration of the article above referred to, pages 4, 5, 6 and 7. The view of St. James's Park from the courtyard of old Buckingham House shows the old long canal-like pond, parallel with Birdcage Walk, which preceded the present irregularly-shaped lake.

The view of the "Jenny's Whim bridge," or "Jenny Whim's bridge" (for it was put both ways), which stood where the street now called Ebury bridge crosses the railway at the end of Victoria station, shows the aspect of that locality as late as 1825, giving some idea of the extraordinary changes which the last century witnessed in this part of London. The water which the bridge crosses was the reservoir of the old Chelsea Waterworks.

The Ranelagh does not, strictly speaking, come within the scope of the article in the present issue, but it touches closely on the borders of the Pimlico district, and is a relic of great interest in itself. The Ranelagh and its gardens were situated at or close to the angle at the present junction of Chelsea Embankment and Chelsea Bridge-road. The Rotunda was a well-known fashionable promenade, frequently referred to in the light literature of the latter half of the eighteenth century. There was a bandstand and an organ, at the latter of which no less a person than "Mr. Handel" occasionally entertained the company with a concerto.

THE LONDON COUNTY COUNCIL.

THE usual meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Lewisham Borough Council 6,500*l.* for extension of offices; Battersea Borough Council, 4,060*l.*, for provision of accommodation at the Town Hall; Shoreditch Borough Council, 10,000*l.*, for extension of offices; Kensington Borough Council, 16,447*l.*, for street improvement; Hampstead Borough Council, 2,590*l.*, for erection of library; and the Managers of the Metropolitan Asylums District, 100,000*l.*, for various purposes.

The Works Department.—The Finance Committee submitted their half-yearly return of works completed by the Works Department. During the half-year ended March 31 last twenty-five works had been completed, but the total gave no indication of the turnover of the department during that period, because some of the expenditure on those works occurred previous to the half-year in question, while, on the other hand, a large part of the expenditure

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during the six months was upon works which were still unfinished. The approximate expenditure on estimated works for the half-year was 155,000*l.* On the total amount of the work comprised in the statement, viz., 83,924*l.*, there was a balance of cost under final estimate of 391*l.*, or 0·5 per cent. Most of the works had been carried out at a cost somewhat less than the final estimates, as certified by the chief engineer or architect. There were six cases in which the cost had exceeded the final estimate, but in only two was the excess considerable. Those were both architectural works, and in the first case the excess of estimate was 9 per cent., and in the other 10 per cent. The jobbing works for the half-year showed that on 1,214 works there was a balance of cost below schedule value of 857*l.*, or 6·9 per cent. At the present time the department had twenty-nine works in progress (exclusive of jobbing works), representing a total estimated cost of 733,350*l.*, in respect of which work to the cost of 546,507*l.* had up to May 31 been executed. There were also thirteen other works not begun, the estimates for which amounted to 124,983*l.*

Mr. Bruce, chairman of the works sub-committee of the Finance Committee, observed that had this report been laid before the Council last week some of the criticisms of the department which were then made would probably not have been put forward. Although, however, this was a favourable report, there were some works now in hand which might not show quite such good results, but at present those results could not be exactly estimated. Much was said last week as to the reorganisation of the department. He did not think it was feasible to put the department directly under the architect or the engineer, inasmuch as both those officers had their hands very full already. The sub-committee consisted of men of great experience, some of whom might indeed be called experts; and watching the department week by week, they were probably able to form a better idea of the strong and weak points of the department than could be formed by an outside commission such as had been proposed. There was little doubt, however, that what he might call the municipal idea, viz., that the workman would work better for the municipality than for a private contractor, had not altogether been a success. It was to him an important matter that they should see whether some form of co-operation could not be instituted which would give some direct interest to the men, and induce them to put their backs into their work.

Mr. Campbell thought it would perhaps be better for them to go back to the Works Committee. The members of the sub-committee who dealt with works really knew nothing about them.

Mr. H. Clarke considered it inconvenient at that stage to discuss Mr. Bruce's proposals. He thought the hon. member should explain himself more fully. Did he mean that the men were to share in the profits or losses, or to do piecework?

Mr. Howell Williams said they wanted the master's eye on the work done. If the department had gone about the work in the right way, the department would have been a magnificent success. Instead of the Finance Committee dealing with such a gigantic institution as the Works Department, he thought it would be better to reinstitute the Works Committee.

The report was received and adopted, and the necessary excess votes were passed.

Resignation of the Engineer.—The General Purposes Committee reported the resignation of the Council's Engineer, Sir A. Binnie, who desired to devote himself to the private practice of his profession. The Committee recommended the acceptance of the resignation, to take effect at the end of the year, and referred to the works which had been carried out during Sir A. Binnie's eleven years' service.

Several members of the Council expressed their high appreciation of Sir A. Binnie's services, and their regret that the Council was about to lose him.

The recommendation was agreed to.

Fire Insurance.—The joint committee on fire brigade expenditure brought up a report with reference to contributions by fire insurance companies towards the cost of the Metropolitan Fire Brigade. They recommended that the municipal authorities of the principal cities and towns of the United Kingdom should be asked to express their opinions on the general subject.

This was agreed to.

The same committee proceeded to submit a scheme of municipal insurance, and recommended that effect should be given to it by inserting clauses in the Council's General Powers Bill next year.

After a short discussion the scheme was approved, and it was decided to communicate with the Local Authorities of London to obtain their views on the matter.

Streets and Street Traffic.—The General Purposes Committee reported as follows, the recommendation being agreed to:—

"On February 19 last the General Purposes Committee reported to the Council the resolutions passed at the conference with representatives of the City Corporation and the Local Authorities, on the subject of street traffic and the cleansing of streets. Among the resolutions were the following:—

(*a*) That, in the opinion of the conference, all streets paved with asphalt, wood, or granite setts, should be well washed, after first sweeping off and removing all the rough dirt and cleaning the channels, the Local Authorities providing properly-constructed catch-pits.

(*b*) That, in the opinion of the conference, greater supervision of the scavenging is absolutely essential to ensure the efficient cleansing of the roads and footways of the metropolis, and that the surveyor to the Local Authority should have sole responsibility for, and unrestricted control over, all labour employed.

(*c*) That, as a general proposition, where they can be suitably employed, machine brooms are to be preferred to hand labour.

(*d*) That, in the opinion of the conference, it is desirable that Local Authorities should provide sweepers for specified areas for the systematic sweeping of the crossings of main thoroughfares.

(*e*) That, in the opinion of the conference, the sprinkling of roads should be done by vans or carts, and that, having regard to the various considerations which apply, it is preferable to water the sides of the roads and channels as frequently as necessary to lay the dust, and the centre of the road at less frequent intervals, with the idea that the road shall not be all wet at the same time.

In the report it was recommended that the resolutions above quoted should be communicated to the Corporation of the City of London, the Metropolitan Borough Councils and the Council of the City of Westminster. The Main Drainage Committee, however, raised objection to resolution (*a*), and on February 26 the series of resolutions (*a*) to (*e*) were referred to the Main Drainage Committee for report. On April 2 that Committee reported as follows:—

Having regard to the duties of the Council as the main drainage authority for London, and to the importance of keeping at all times the main sewers as free as possible from detritus, especially in times of rainfall, when the unobstructed flow of sewage and storm water may be essential to prevent the flooding of property, we do not see our way to concur in the opinion expressed in resolution (*a*). The result of our experience during past years confirms our belief that the adoption of the resolution would be detrimental to the Council's interests, and we therefore omit it from our recommendation. As regards the remaining resolutions (*b*) to (*e*) we have no observations to offer, and accordingly recommend—

'That the above resolutions, (*b*) to (*e*) inclusive, be communicated to the Corporation of the City of London, the Metropolitan Borough Councils, and the Council of the City of Westminster.'

The report, however, was at our suggestion withdrawn, with a view to the Main Drainage Committee stating more fully their reasons for desiring resolution (*a*) to be omitted. We have been in communication with the Main Drainage Committee and have further considered the matter.

The question of cleansing the streets appears to us to be one of paramount importance, and we do not see that this can properly be done unless the streets are well washed. The Main Drainage Committee appear to be of opinion that if the resolution of the conference is adopted by the Council the result will be that the detritus in the sewers will be considerably increased, and the sewers prevented from taking away the sewage and storm water with sufficient rapidity. We would, however, point out that there is a proviso in the resolution in question that the streets are first to be properly swept, and we think that if the sweeping were performed to the satisfaction of the Council's Engineer, the objections on this score would be met. We recommend—

'That resolutions (*a*) to (*c*) be communicated to the Corporation of the City of London, the Metropolitan Borough Councils, and the Council of the City of Westminster, but that in forwarding the resolutions the attention of the Local Authorities be drawn as regards resolution (*a*) to the necessity for the streets to be thoroughly swept before being washed, the arrangements made for such systematic sweeping being subject to the approval of the Engineer of the London County Council.'"

By-laws as to the Drainage of Buildings.—It was agreed that copies of the drainage by-laws made by the Council, and approved by the Local Government Board, be placed on sale at the price of 2d. per copy. The Board has confirmed the by-law made by the Council for the purpose of repealing the last paragraph of By-law 3 and the whole of By-law 4 under Section 39 of the Public Health (London) Act, 1891, in relation to soil-pipes and the ventilation of the traps of water-closets. Corresponding provisions to those repealed are contained in the new drainage by-laws, Nos. 11 to 17.

Improvements.—The Improvements Committee recommended, and it was agreed, that, subject to the necessary statutory consents to the proposed tramway from the Marble Arch along Edgware-road to the county boundary at Cricklewood being obtained from the Local Authorities concerned, and subject to the Councils of the Metropolitan Boroughs of Paddington and Hampstead agreeing to contribute between them one-third of the net cost of the necessary street widenings and subject also to one-third of the net cost of the street widenings being charged to the account of the improvement, the remaining third being charged to the tramways account, which will also be charged with the whole cost of laying down and paving the tramway track, parliamentary powers be sought in the session of 1902 to enable the Council to widen Edgware-road, High-road, Kilburn, and Shoot-up Hill, in general accordance with the plan approved by the Improvements Committee.

Theatres, &c.—The following proposals were agreed to:—

A room in the basement of the Bermondsey Town Hall, Spa-road, Bermondsey, for use as a dressing and refreshment-room by the persons engaging the public hall (Mr. R. J. Angel).

Certain alterations which it is desired to make to Drury Lane Theatre (Mr. P. E. Pilditch).

Chinese encampments at the London Exhibitions, Earl's Court (Mr. A. O. Collard).

Re-arrangement of the seating in the pit and stalls of the Oxford Music-hall, Oxford-street (Messrs. Wylson & Long).

Office Accommodation.—On the recommendation of the Establishment Committee it was agreed

"(*a*) That the resolution of the Council of March 26, 1901, authorising an expenditure of 8,000*l.* in connexion with a scheme for connecting the premises Nos. 25, 26 and 27, Cockspur-street with the main building be rescinded.

(*b*) That the estimate submitted by the Finance Committee be approved, and that the expenditure of a sum not exceeding 3,500*l.* be authorised for carrying out alterations for the purpose of connecting the premises Nos. 26 and 27, Cockspur-street, with the main building, and further that the expenditure of a sum of 1,004*l.* be authorised for certain repairs, removal of fittings, &c., in connexion with the same work; and that the work be carried out by the works manager as a jobbing work."

Tramway Questions.—Mr. Benn, Chairman of the Highways Committee, in answer to questions, said that the Highways Committee, feeling that the erection of the generating station would delay the adoption of electric traction in South London, had inquiries made in the district, and it was found that they would be able to obtain power there at an earlier date, so that, without being unduly optimistic, within eighteen months they would have electric cars running in South London.

The Committee recommended, and it was agreed—

"That the operation of No. 200 of the Standing Orders of the Council, relative to retention moneys under contracts of less than 100,000*l.* be suspended as regards the contracts for the supply of (*a*) the continuous-current plant, and (*b*) the three-phase plant required for the electricity generating station to be established in connexion with the electrical working of the London County Council Tramways; and that, in place thereof, it be provided in those contracts that 50 per cent. of the value of the machinery be paid to the contractor upon its being delivered at the site, 30 per cent. after the machinery shall have been erected in position, 10 per cent. after its having been taken over, and 10 per cent. after it shall have been maintained by the contractor for twelve months."

The Council, having transacted other business, adjourned.

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METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of this Board was held on Saturday at the Board's offices, Thames Embankment.

The Finance Committee reported that the Works Committee had forwarded an estimate for erecting, fitting-up, and furnishing the proposed receiving house for children at the Tooting Bec Asylum. The estimate, which amounted to 16,670*l.*, included 11,566*l.* for structure of the building, 1,000*l.* for drainage, and 1,120*l.* for furnishing. The committee recommended, and the Board approved, that an application be made to the Local Government Board for an order authorising the managers to expend the sum stated, such expenditure to be defrayed by a loan spread over thirty years.

On the recommendation of the Hospitals Committee it was agreed to accept the tender of Messrs. R. Ballard, Limited, of Child's Hill, in 985*l.*, for the repair of roads at the Northern Hospital. The other tenders were H. Bentham & Co., Streatham Hill, 1,072*l.*; Thos. Adams, Wood Green, 1,097*l.*; Neston & Hale, Harlesden, 1,129*l.*; Robert Borrowdale, Enfield, 1,289*l.*; Myers, Gilson, & Rose, Hornsey, 1,985*l.*

The Works Committee formally reported the terms of the settlement in the case of the managers and Messrs. Kirk & Randall. Amongst the cheques which the Board were recommended to draw were two for 392*l.* and 39*l.* 12s., being the amount respectively of Mr. Tiltman's expenses in connexion with the defence of the action and the costs of the arbitrator's award.

On the recommendation of the Works Committee, the plans of stables proposed to be built at the Tooting Bec Asylum were approved and ordered to be transmitted to the Local Government Board.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage and Projections.

Lewisham.—An extension of the period within which the erection of buildings on the southern side of an extension of Manor Park, Lee, was required to be completed, be granted (Messrs. Johnson & Aldridge).—Agreed.

Lewisham.—A fire-brigade station on the north side of Perry Vale, Lewisham, at the corner of Woolstone-road (O. Fleming for the Fire Brigade Committee of the Council).—Consent.

Hackney, Central.—One-story shops in front of Nos. 489, 491, and 493, Kingsland-road, Hackney (Mr. J. Hamilton for Mr. J. Dyke).—Consent.

Hackney, North.—An addition at the east end, and a porch on the north side, of the Congregational Church, Stamford Hill, to abut upon Portland-avenue (Mr. W. W. Baldwin for the Rev. J. M. Gibbon).—Consent.

Hammersmith.—A block of flats, with shops on the ground floor, on the site of Nos. 156 and 158, Uxbridge-road, Hammersmith (Mr. A. H. Hart for Mr. C. Tarrant).—Consent.

Hampstead.—Wood and tile pent roofs over the entrances to six semi-detached houses on the north side of Rondu-road, Edgware-road, Cricklewood (Mr. J. Phœnix for Messrs. Bridge & Neal).—Consent.

Islington, North.†—Retention of a studio addition at the rear of No. 214, Seven Sisters-road, Islington, abutting on Coleridge-road (Mr. R. Midworth for Mr. J. Fortescue).—Consent.

Marylebone, West.—A building over the stable-yard of No. 3, Finchley-road, St. John's Wood (Messrs. Durrans & Groves for Mr. D. F. Hannay).—Consent.

Wandsworth.†—Five one-story shops on the south side of Lower Richmond-road, Putney, westward of Martyn's Waterman's School (Mr. F. A. Powell for Mr. A. C. Ballard).—Consent.

Wandsworth.—A one-story shop on part of the forecourt of No. 2, Ashlone-terrace, Lower Richmond-road, Putney (Mr. J. G. Warner for Messrs. J. & R. Baily).—Consent.

Marylebone, East.—Retention of a bicycle shed on the forecourt of No. 85, Park-road, St. Marylebone (Mr. F. Perks, for Mrs. C. F. Gordon).—Consent.

Lewisham.—That the Council do make no order with respect to the application of Mr. H. Bender for permission to retain an iron and glass illuminated sign at the Talma public-house, No. 108, Wells-road, Sydenham, in advance of the general line of buildings in Coombe-road.—Agreed.

Clapham.†—Buildings on the east side of Park-hill, Clapham, on part of the site of Nos. 122 and 124, Clapham Park-road (Mr. A. Southam, for the Council of the Metropolitan Borough of Wandsworth).—Refused.

Clapham.—Three houses with shops on the north side of Battersea-rise, Battersea, at the corner of Limberg-road (Mr. G. E. Nield, for Mr. W. J. Vokes).—Refused.

Lewisham.†—An addition to a porch at the side of No. 119, Burnt Ash-hill, Lee, to abut upon Corona-road (Mr. E. Petters, for Mr. S. C. Joyce).—Refused.

Wandsworth.—A block of residential flats on the south-east side of Oakhill-road, Upper Richmond-road, Putney, on the site of Burlington House (Mr. A. Blackford, for Mr. E. Messiter).—Refused.

Westminster.—A one-story shop on the forecourt of No. 280, Vauxhall Bridge-road, Westminster (Mr. S. Nixon for Mr. T. W. Smith)—Refused.

Woolwich.—Houses, with one-story shops on the ground floor on the eastern side of Woolwich-road and south-eastern side of Greenvale-road, Eltham (Mr. G. F. Logsdail for Mr. A. Cameron Corbett, M.P.)—Refused.

Width of Way.

Fulham.—That the application of Mr. W. L. Eves for an extension of the period within which the rebuilding of Nos. 9 and 11, Fane-street, North End-road, Fulham, was required to be commenced, be granted.—Agreed.

Hackney, South.†—A boundary fence in front of stables at Ash-grove Works, Sheep-lane, Hackney (Mr. J. Hamilton for Messrs. W. J. Bush & Co., Limited).—Consent.

Peckham.—Stable buildings at the rear of Nos. 899 and 901, Old Kent-road, Peckham (Mr. J. H. Waterworth for Mrs. M. A. Chalk).—Consent.

Southwark, West.—An addition to a block of dwelling-houses, to be inhabited by persons of the working class, on the north side of Summer-street, Southwark (Mr. F. Bailey for the City of London Electric Lighting Company, Limited).—Consent.

Hackney, North.—A one-story addition to No. 1, Tyssen-pavement, Dalston-lane, Hackney, at less than the prescribed distance from the centre of Hartwell-street (Mr. F. McCann)—Refused.

Width of Way, Lines of Frontage and Projections.

Camberwell, North.—Buildings and boundary walls at the Camberwell Infirmary, Havil-street, Camberwell, at less than the prescribed distance from the respective centres of Havil-street, Brunswick-road, and Brunswick-square (Mr. E. T. Hall for the Guardians of the Parish of St. Giles, Camberwell).—Consent.

Bermondsey.—Warehouse buildings on the site of Nos. 31 to 51 (odd numbers only, inclusive), Long-lane, Bermondsey (Messrs. G. Harding & Sons).—Consent.

Haggerston.—A new wing to the North-Eastern Hospital for Children, on the north side of Hackney-road, Bethnal Green, at the corner of Goldsmith's-row (Messrs. Marshall & Vickers for the Committee of Management of the Hospital).—Consent.

Marylebone, East.—An open portico and a one-story bay-window in front of No. 6, Duchess-street, Portland-place, St. Marylebone (Mr. L. A. Hayes for Mr. W. Tebb).—Consent.

Hampstead.—A laboratory building at the rear of a house known as Danecourt, Hollycroft-avenue, Hampstead, to abut upon Platts-lane (Mr. W. G. King for Mr. A. G. Green).—Refused.

Line of Frontage and Construction of Building.

Hackney, South.—The retention of a covered way between the basement entrances of Nos. 8 and 10, Southwold-road, Hackney (Mr. J. Hamilton for the executors of the late Mr. C. Butters).—Refused.

Width of Way and Construction of Building.

Hammersmith.—A wood and iron workshop in the yard at the rear of No. 21, Eyot-gardens, Hammersmith, at the corner of Homefield-passage (Mr. H. J. Carline).—Refused.

Space at Rear.

Holborn.—A building on the site of No. 66, Theobald's-road, at the corner of Emerald-street, Holborn, with a portion of the building on the open space required to be provided at the rear (Mr. R. L. Cox for Mr. M. Boyce).—Consent.

Formation of Streets.

Woolwich.—That an order be issued to Mr. J. O. Cook, sanctioning the formation or laying out of a new street for carriage traffic to lead from Macomaroad to Ennis-road, Plumstead (for Mr. H. W. Grant).—Agreed.

Deptford.—That an order be issued to Mr. A. J. Glock refusing to sanction the formation or laying out of streets for carriage traffic to lead out of the north side of Knoyle-street, Deptford.—Agreed.

Dulwich.—That an order be issued to Mr. C. J. Bentley refusing to sanction the formation or laying out of a new street for carriage traffic to lead out of the north-west side of Overhill-road, East Dulwich, into a lane leading from Goodrich-road (for Mr. H. G. Leonard)—Agreed.

Dwellings for the Working Classes.

Whitechapel.—Two blocks of intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site between Brady-street-dwellings, Salomon's-almshouses, and the Jew's disused burial-ground, Brady-street, Whitechapel (Mr. G. B. Parkes for the G.E.R. Company).—Consent.

Buildings for the Supply of Electricity.

Greenwich.—An addition on the south side of the Blackwall and Greenwich District Electric Lighting Company's, Limited, generating-station and works, Blackwall-lane, East Greenwich (Messrs. Bramwell & Harris).—Consent.

Woolwich.—Deviation from the plans sanctioned on May 20, for the construction of an electricity generating-station and works on the east side of White Hart-road, Plumstead Marshes, so far as relates to the construction of a chimney-shaft at such works (Mr. F. Sumner for the Council of the Metropolitan Borough of Woolwich).—Consent.

Means of Escape from top of High Buildings.

City of London.—Means of escape in case of fire on the top story of No. 124, Fenchurch-street, City (Mr. G. D. Martin, for Mr. E. G. Marshall).—Consent.

Marylebone, East.—Means of escape in case of fire on the fifth floors of four blocks of residential flats on the site of Harley House, on the north side of Marylebone-road, at the corner of Brunswick-place (Messrs. Boehmer & Gibbs, for Mr. C. J. Hinsley).—Consent.

Dwelling Houses on Low-Lying Land.

Woolwich.—That the solicitor do prepare a licence under Section 122 of the Act to Mr. J. Bailey, for the erection of a dwelling-house on land situated on the north side of Bostall-lane, Abbey Wood, Plumstead (Mr. T. J. Young for Mr. Bailey). Consent.

Greenwich.—That the Council do make no order upon the application of Mr. E. Crosse on behalf of Messrs. Edwards & Edwards for the Council's licence in respect of dwelling-houses erected on low-lying land situated in Azof-street, Christchurch-street and Bellot-street, East Greenwich.—Agreed.

The recommendations marked † are contrary to the views of the Local Authorities.

Correspondence.

To the Editor of THE BUILDER.

THE SAFETY OF ST. PAUL'S CATHEDRAL.

SIR,—You have several times in your columns called attention to the great danger which threatens the structure of St. Paul's Cathedral should the newly-projected railways be permitted to burrow too near its foundations.

It does not seem to be generally known that the building is already cracked from top to bottom, and that in several places. Movements of a serious nature have taken place and have increased.

Sir Christopher Wren was well aware that the subsoil on which he had to place the structure was not very good. He knew that the hard clay lay about 40 ft. below, but we may fairly say that it was out of the question with the means at his disposal to carry down the footings of this vast structure to such a depth. He found that the old cathedral had stood on a layer of "pot earth," as he describes it, varying from 6 ft. to 4 ft. thick, which lay over a bed of sand and shingle. This layer he knew to be not very solid in itself, but unless attacked, as it now has been during the last century, by deep drains, underground railways, &c., it was sufficient. He spread the footings of the church to a very great extent, evidently in view of the nature of the ground. The old cathedral was an excessively heavy building. Its central tower was nearly as large in all dimensions as the Victoria Tower, and on it was a spire as tall as the tower. What had supported this (and no doubt it had but imperfect foundations) Wren considered to be sufficient to carry his dome with very broadly spread footings.

Notwithstanding his precautions the ground yielded a little, consolidating under the great weight of the dome and its supports. The arches of the nave, choir, and transepts which abut on the dome piers have all been dislocated. Had the subsoil been left undisturbed, we may fairly suppose that no further movements would have taken place. At the bottom of the sandy stratum and over the clay water is found, and this no doubt was soon tapped

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as the business of the city increased. A source of great danger to the fabric of the cathedral was thus established.

About 100 years since great ties of iron were put into the cathedral half way up the walls. The transepts were tied back to the dome piers, and were also tied across their fronts in the direction from east to west.

Since that time the south transept has shown strong indications of an inclination to slide southwards down the hillside towards the Thames. And not only is there movement towards the south, but the wall has opened from east to west. This enormous wall, 8 to 10 ft. thick, 130 ft. wide, and of an equal height, is at this moment showing a tendency to move as above stated; and the movements are such that the breakage is evidently caused, not by the thrusting of arches, but by the actual subsidence of the soil beneath.

When we reflect that there are now between the church and the river not only deep drains, but the Underground Railway beneath Queen Victoria-street, and the Waterloo and City line beneath that, it is evident that the subsoil on which the ponderous masses of masonry rest has been seriously attacked. The west front, with its heavy towers and bells, has also subsided.

I must not take up more of your space but to say a word on the masonry of the cathedral. The church is faced externally with Portland stone. The hearting of the walls is entirely of rubble, a mixture of Caen and Oxfordshire stone, procured from the old cathedral, neither hard nor tenacious. The interior is faced with the same Oxfordshire stone, Portland only being used for projections.

Wren knew what stone he had to deal with. He built his piers of sufficient dimensions. There is nothing to show that he made mistakes in his calculations; but he did not anticipate that the support of his foundations would be sapped. The more one is intimately acquainted with this superb building the more one is lost in admiration at the forethought, the ingenuity, and the resourcefulness of "the incomparable Doctor Wren." Let us hope that the much-needed facilities for locomotion will at least respect so magnificent a monument.

SOMERS CLARKE.

PERSHORE ABBEY TILES.

SIR,—For your notice of my book, "The Benedictine Abbey of SS Mary, Peter, and Paul at Pershore" I have to thank you; but I think in justice to myself you will allow me to say, concerning the drawings of the tiles to which you take such emphatic objection, that they are, as stated on them, facsimile reproductions; they are by no means completed sketches of their original condition, as, I take it, those of Mr. R. W. Paul in your issue of October 2, 1897, are, but are illustrations of them as they *now* are, worn and more or less obliterated.

It may be a matter of opinion as to which is the better form of record, but it seems from your statements that, because I have not attempted to restore the flowing and graceful lines of their designs, I am charged with carelessness and lacking appreciation of their form and beauty. This is not so; and I think you will allow me in this explanation that the criticism was the result of a misunderstanding of my purpose.

FRANCIS B. ANDREWS.

P.S.—As a matter of fact, they each were very carefully traced, and from the tracings, by photographic process, the reduced facsimiles were prepared for the book.

BOOKS RECEIVED.

LOCAL LONDON: A MUNICIPAL DIRECTORY FOR THE METROPOLIS AND SUBURBS. (P. S. King & Son.)

DESIGNING IRONWORK. Second Series. Part II. By Henry Adams, M Inst.C.E. (Published by the Author.)

DICKSON MEMORIAL HALL, LAURENCEKIRK, KINCARDINE. — The Dickson Memorial Hall, Laurencekirk, has just been opened. The building consists of a main hall, with a subsidiary classroom, retiring-rooms, &c. The hall, which will accommodate an audience of about 300, is 63 ft. in length by 25 ft. in width inside, with side walls 12 ft. 6 in. high from the floor to the eaves, and is covered by an open timber roof, the apex of which is about 33 ft. above the floor level. A feature of the building is the timber flèche, which rises to a height of 18 ft. above the ridge of the roof. The roofs are covered with slate from Precelly. The mason work was done by Mr. Alexander Watt, builder, Laurencekirk. The architect was Mr. William Kelly, Aberdeen.

The Student's Column.

GAS AND GAS FITTINGS.

I.—INTRODUCTION.

THE gas industry was founded by the Scotch engineer, William Murdoch, in the last decade of the eighteenth century. Prior to that period no gasworks of any description existed in any part of the world, although it had long been known that inflammable gas could be obtained from coal and certain other substances by distillation, and could be led through a pipe and consumed at its open end.

Claims of priority of discovery of the fact that gas obtained by the distillation of coal could be used for lighting purposes have been made for certain Continental experimentalists, but the fact that Murdoch was the first to establish gas manufacture as an industry, and the first to erect gasworks for lighting purposes on a comparatively large scale, is beyond dispute.

During the nineteenth century the industry rapidly developed into one of foremost importance. Gas-producing plant was erected in every civilised country, and gas securities took rank with those of water and railway undertakings. The introduction of electricity and of cheap oil caused fluctuations in the value of gas shares, but did not cause any diminution in the world's rate of gas production. Not only is the consumption of gas at the present time greater than at any previous period, but extensions of existing plant are in course of erection in numberless districts. At the close of the century 1,614 separate gas undertakings were in existence in the United Kingdom alone, and these collectively manufactured gas at the rate of 156,665,269,000 cubic feet per annum.

In the early part of the nineteenth century all the gas undertakings were controlled by private owners or by companies, but throughout the last half century Local Authorities have evinced an increasing desire to obtain control of the works supplying gas to their respective districts. In spite of the fact that gas properties have become so valuable that high prices have always to be paid for them, we find on reference to the "'Gas World' Year Book" for the current year that 265 gas undertakings in the United Kingdom are already in the hands of the Local Authorities, and included in this list of localities supplied with municipal gas are the towns of Aberdeen, Belfast, Birkenhead, Birmingham, Blackburn, Edinburgh, Leeds, Leicester, Nottingham, and Manchester.

At first gas was manufactured exclusively from coal and was used almost solely for lighting purposes, but as time progressed and the art of gas-making was more closely studied by chemists and engineers, it was found that inflammable gas could be economically manufactured from a number of other materials, and that illumination was but one of a great number of purposes for which gas was eminently suited. Certain kinds of sawdust and timber yield very good gas, and even sewage has its advocates as a gas-making material. In certain parts of the world, notably in the United States, America, vast subterranean accumulations of so-called "natural gas" have been discovered, and these have been tapped and distributed in the neighbouring towns as a substitute for coal-gas. An accumulation of inflammable gas has recently been discovered in this country, at Heathfield, in Sussex, and the gas has been employed for lighting the local railway station by the incandescent gas-light system. The gas in these storage chambers is, of course, all consumed sooner or later, as the formation of gas, if still proceeding, proceeds at a very slow rate. Sometimes, however, the quantity of natural gas discovered is very large, and is sufficient to supply a town for many years. In the neighbourhood of coalfields natural gas had been discovered long before Murdoch was born, but no successful attempt had been made to utilise it for lighting purposes. During the last five years acetylene gas, produced from calcium carbide, has also been extensively used, but at the present time the only gaseous rivals which are being used to a formidable extent as a substitute for coal-gas are water-gas and the diluted form of water-gas commonly termed "fuel-gas" or "producer-gas."

By blowing steam through strongly-heated coke or other form of carbon a non-luminous gas can be manufactured which possesses about half the heating value of coal-gas, and which can be produced in many localities at much less than half the cost. If illuminating gas be required, the non-luminous gas can be mixed with oil-gas or enriched in some other manner, and thus be made to resemble coal-gas in illuminating power. Carburetted water-gas, as the mixture of oil-gas and water-gas is termed, is, however, inferior in some respects to coal-gas of equal illuminating power. The difference between the two varieties of gas will be explained in a succeeding paper.

It is obvious that the solution of the question as to whether coal-gas, water-gas, or carburetted water-gas is the most suitable for the supply of a specific district is dependent upon the local prices of gas-coal, coke, and oil, and upon the purposes for which the main proportion of the gas is required. In some districts cheap gas of a low illuminating value is the most suitable; but in districts in which good gas-coal is abundant and cheap, coal-gas of comparatively high illuminating value remains the most economical supply.

As coke is one of the residuals obtained from the distillation of coal, it frequently happens that a mixture of coal-gas and carburetted water-gas may be economically supplied. As a matter of fact, carburetted water-gas *per se* is very largely used in America, while in London, north of the Thames, and in many other British towns, a mixture of coal-gas with carburetted water-gas is used. In factories where the gas is used for driving engines cheap non-luminous fuel-gas is largely used, the consumption of Mond gas at the works of Brunner, Mond, & Co., in Cheshire, for example, being about a million cubic feet *per hour*.

The manufacture of gas of different composition, specific gravity, illuminating power, and calorific value in different localities has rendered it necessary for a purchaser of gas appliances to take into consideration the district in which the appliances are to be fitted, if they are to be used under the most favourable conditions. The satisfactory use of gas is, moreover, made difficult by fluctuations in the pressure of the gas supplied. In London the tests made by the gas examiners appointed by the London County Council show that the pressure in the street mains varies from about 1·4 in. to 3·8 in. of water, and in buildings the pressure sometimes fluctuates to a yet greater extent owing to defects in the fitting of the local service-pipes, and the height to which the pipes are carried. The pressure in buildings in London seldom exceeds 3½ in., but it often falls to 1 in., and at the latter pressure many gas appliances fail to work in a satisfactory manner. Gas governors may be used to reduce the pressure to any desired point, but are useless when trouble is caused by insufficient pressure. An "atmospheric" gas fire which will burn satisfactorily with coal-gas supplied at 1½-in. pressure will not burn so well with a mixture of coal-gas and water-gas of the same illuminating power supplied at the same pressure, because water-gas, whether plain or carburetted, has a higher specific gravity than coal-gas, and having a different composition, requires a different proportion of air for its combustion. This fact is recognised by some of the gas-fire makers, who supply a special fitting for use with water-gas mixtures.

Where gas is supplied of uniform composition and at a uniform pressure appliances can readily be devised to consume the gas in a satisfactory manner, whatever may be its composition or the pressure (above 1½ in.) at which it is delivered from the mains; but in London north of the Thames, and in certain other localities, much trouble has been caused by frequent fluctuations in both composition and pressure.

For the incandescent gas-light system non-luminous gas is as serviceable as illuminating gas, provided it possesses the same heating power, and recent experiments by Dr. Strache appear to prove that water-gas, having only one-half the heating value of coal-gas and being quite devoid of illuminating power, may be as efficient for lighting purposes by this system as the coal-gas. If illuminating gas is to be used for incandescent gas lighting, it must be mixed before reaching the point of ignition with sufficient air to cause it to burn with a non-luminous flame; otherwise the mantle will become coated with soot and cease to emit light. In view of the recent statement of Mr. George Livesey, Chairman of the South Metropolitan Gas Company, that 50 per cent. of the gas sold by that company is used for purposes other

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than lighting, and of the fact that throughout the country the ratio of gas used for heating to that used for lighting (other than incandescent lighting) is already large and is increasing at a rapid rate, it is apparent that the commercial value of gas is now dependent upon its calorific value rather than upon its illuminating power.

In practical gas manufacture it is found that the higher the illuminating power of the gas the greater is its heating power; but no inflexible law simultaneously controls the two factors, and it is possible to produce two gaseous mixtures, the one giving a non-luminous flame and the other a flame having a certain illuminating power, of which the non-luminous flame shall be capable of yielding more light with the incandescent mantle than the illuminating gas. It has, moreover, been found that the increase in heating power of a so-called "high quality" gas is often very far from being proportionate to the increase in the cost of manufacture; and in Styria the town of Pettau has been brilliantly lighted with non-luminous water-gas and incandescent mantles in preference to employing the more costly coal-gas. The water-gas is made and purified by the "Strache" process, the fuel employed being a low-quality brown coal.

During the last fifteen years the number of purposes to which gas has been applied has increased to a remarkable extent, and has, of course, been accompanied by a corresponding increase in the variety of gas appliances manufactured. The penny-in-the-slot prepayment meter has also been introduced within that period, and has proved so popular that there are already about 800,000 of them in use in the United Kingdom alone. Since the introduction of the slot meter the use of the ring burner for boiling water has become general in all large towns, even in the workman's tenement or cottage, and prepayment gas fires have become extensively employed for hotel bedrooms.

These facts sufficiently indicate the importance to all gas consumers, and especially to students of building construction, of a knowledge of what is being done at our great gas factories, of the facilities which exist for using gas for domestic purposes and in the various arts and crafts, and of the concessions which are now being granted by many gas companies, under the spur of competition, and in recognition of the more extensive requirements of gas consumers of the present day. In the present series of papers these matters will be discussed, and a description will be given of modern burners and various appliances for the use of gas, while the concluding papers will be devoted to acetylene gas and the apparatus employed for its generation and consumption.

Much has yet to be discovered before the highest possible efficiency in light, heat, or power can be obtained from inflammable gas, but a large number of the complaints which from time to time are made against the public gas supply are due to ignorance, and result either from misuse of the gas or from its avoidable deterioration after manufacture. Sometimes the gas manufacturer is at fault; but more frequently the consumer who consumes the gas in unsuitable burners, or the architect who approved the internal fittings of the building and the contractor who supplied them, are really responsible for the fact that the gas fails to perform its legitimate duties. The causes which lead to many of these complaints, and the precautions which must be observed in order to obtain satisfactory results from the gas, will be discussed in subsequent chapters.

OBITUARY.

MR. W. L. SUGDEN.—We regret to announce the death, on June 18, at Leek, Staffordshire, of Mr. William Larner Sugden, aged 50 years, of Leek and Hanley. Mr. Sugden was elected a Fellow of the Royal Institute of British Architects in 1892, and for some years past had been surveyor to the Stoke-upon-Trent Rural District Council. Mr. Sugden was the son of William Sugden, of whom he was partner, and upon the death of his father in September, 1892, he succeeded him in his professional practice. The firm of Messrs. William Sugden & Son carried on a large practice in the northern large manufacturing towns of Staffordshire, including the pottery districts, in South Lancashire, and in parts of the counties adjacent. The firm of Messrs. William Sugden & Son, conjointly with Mr. John Blood, Mr. W. H. Sugden, and Messrs. Chapman & Snape, were architects of the new Public Buildings, Newcastle-under-Lyme, of which we published their own, and the modified designs, as accepted, with elevations and plans, on April 24 and May 1, 1886, and May 4, 1889. Of the other more important works that were entrusted to the firm we may mention the following:—The Congregationalists' New Tabernacle Church Buildings at Hanley (July 7, 1883*); their first premiated designs for a model village at Aintree (August 25, 1888, with ground plan, as laid out by them*); the house, Wyndyate, at Scarborough (October 17, 1885*); and the enlargement of the house, Woodcroft, at Leek (December 12, 1891, elevation, ballroom, and plan*); also, we believe, the police station and the District Bank at Leek. In January, 1899, the firm gained the first premium in the limited competition for the New Liberal Club House at Crewe, and in July, 1889, they won the first premium in the competition in respect of extensive alterations and improvements, comprising new heating and ventilation arrangements, for the Town Hall at Congleton. In 1889-90 they carried out the conversion of the old Mechanics' Institute, Hanley, for purposes of the North Staffordshire Technical Museum. As Surveyor to the Hanley Town Council, Mr. W. Larner Sugden superintended the planning and construction of the Abbey Hulton section of the Bucknall sewerage scheme, and as Surveyor to the Stoke-upon-Trent Rural District Council he acted in a similar capacity in respect of the pumping-station buildings and other works at Bucknall. Of Mr. Sugden's architectural work during the nine years since he succeeded his father, we may cite two houses at Rugby, one being for Mr. T. Hunter (October 24, 1896*), and Hillmorton House, for which the designs were exhibited in the Royal Academy rooms in 1897; "Maison Rouge," at Buxton, for Mr. F. Smallman (December 4, 1897*); "One Ash," at Woodthorpe, near Loughborough; a residence at Quorn, Leicestershire, and a boathouse at Rudyard. In October, 1898, Mr. W. Larner Sugden was appointed architect for the new Technical Schools and the "William Carr" Gymnasium at Leek, which constitute an extension of the Nicholson Institute, as previously planned and designed by the firm of Messrs. William Sugden & Son. He was the architect of the Congregational Manse at Leek (1898); the new head offices, stores, assembly and ballrooms, bakery, &c., for the Leek and Moorlands Co-operative Society; of the new school buildings, &c., at Kingsley, Staffordshire (1894); and, conjointly with Messrs. Mosley & Anderson, gained the second premium—ten sets of designs being submitted—in the competition for the new market buildings at Leeds (1895). Mr. Sugden succeeded Mr. Bradford upon the retirement of the latter as Surveyor to the Stoke Rural District Council, and in 1896 prepared a scheme, which the Council adopted, for a sewage farm, irrigation, drainage, and other works on forty acres of land, an Adams' sewage lift, pumping station at Bucknall, together with main sewers for the whole of the township.

* Illustrated in the *Builder*.

GENERAL BUILDING NEWS.

ST. EUNAN'S CATHEDRAL, LETTERKENNY, IRELAND.—The new St. Eunan's Cathedral, of the diocese of Raphoe, at Letterkenny, was opened on the 16th ult. The cathedral stands on an elevated site overlooking the town of Letterkenny. The building, says the *Irish Independent and Nation*, is cruciform in shape, and at the intersection of the nave and transepts there are four arches resting on four square columns, ornamented with panels carved in high relief with subjects of religious history in Donegal. The aisles are divided from the nave by an arcade of five arches in each side, supported on clustered columns, with carved capitals and bases. The choir is in the form of an apsidal ending with nine sides, in each of which is an acutely pointed arch, communicating with the ambulatory. The ambulatory is lighted by nine lancet windows, and above the chancel arcade are thirteen windows, filled with stained glass, representing incidents in the life of our Lord. The great western door is a high-pointed arch, deeply recessed and richly moulded. Above it is a seven-lighted window with rose tracery. Similar windows of smaller size light the transepts. The tower stands at the north-eastern angle. It will be surmounted by a spire, the whole rising to a height of 240 ft., the tower measuring 120 ft., and the spire 120 ft. The cathedral is 200 ft. long, 100 ft. wide across the transepts, and 66½ ft. across the nave and aisles. There is a departure from the Pointed style in the entrance to the transepts, the doors being in the Hiberno-Romanesque, with characteristic Gaelic ornamentation. On the columnar supports of the arches at the intersection of the nave and aisles the figures in alto relievo in the panels are very interesting. Many striking incidents in the life of St. Columcille are depicted in a series of panels on the column on the right-hand side of the nave; while on the left-hand side is the Adamnan Column devoted to illustrations of incidents in the life of the founder of the church and diocese of Raphoe. Figures of the Trinity and other subjects ornament the arch. The peal of bells, weighing close on ten tons, has been cast by Mr. Mathew Byrne, Dublin. The sanctuary lamp, the tabernacle door, the altar gates, and the lighting appliances have been executed by Messrs. John Smyth & Sons, of Dublin. The following are some of the other contracts:—High altar, Mr. Sharpe; pulpit and sanctuary railings, Mr. Pearse; Lady altar and St. Columba's altar, Mr. Ryan; "Theology" for the Sacred Heart altar and holy water fonts, Mr. Smith; Bishop's throne and choir stalls, Messrs. Beakey; confessionals, Messrs. Noonan; oak seats and case for organ, Messrs. Dovey & Mullaly; oak porch, Messrs. Sharp & Emery; baptistry gates, Messrs. Fagan & Co.; candlesticks and vases, Messrs. Kane & Gunning; stained glass window in baptistry chapel, Mr. Clarke; ornamental gates and railing of enclosure, Messrs. M'Gloughlin. In April, 1891, the tender of Mr. M'Clay was accepted for the work, and the foundation-stone was blessed on September 6. Following on the death of Mr. Hague, the architect, whose plans were chosen for St. Eunan's, his place was taken by Mr. M'Namara. Side by side with the erection of the cathedral were provided residences on an adjoining hillock for the Bishop and the priests.

NEW CHURCH OF ST. COLUMB, BAYSWATER.—The new Church of St. Columb, Lancaster-road, was consecrated recently by the Lord Bishop of London. Mr. Hodgson Fowler, F.S.A., of Durham, was the architect. The builders were Messrs. Godson & Sons, of Kilburn.

SCHOOL CHURCH, NETHER GREEN, SHEFFIELD.—A school-church was opened at Nether Green on the 20th ult., for the Methodist New Connexion body in Sheffield. The premises consist of a school-room, to be used as a school and chapel, and a lecture-room, which will accommodate forty persons. The larger apartment is capable of seating 200 worshippers. The building is of brick, with Ashlar stone dressing, and the architect is Mr. J. C. Innocent.

MISSION CHURCH, LYNN.—The Lord Bishop of Norwich recently consecrated the new mission church of St. Michael and All Angels, which has been erected on the Saddlebow-road, in All Saints' Parish, near South Lynn station. It has a nave 69 ft. long by 35 ft. wide, a chancel 30 ft. by 17 ft., with a choir aisle, organ-chamber, and two vestries. The building is composed of carr-stone and red bricks, and the roof, an open timber one, is covered with red tiles. It has seating accommodation for some 300 people. Adjoining the church is an infants' school with accommodation for about 170 children. The architect was Mr. L. F. Eagleton, and the builder Mr. R. Dye.

HIGHER GRADE SCHOOL, ILFORD.—The Park Higher Grade School, situated in Melbourne-road, Ilford, was opened recently by the Bishop of Barking. Mr. C. J. Dawson, the architect, explained that the new building was designed on the central hall and classroom principle; it comprised three stories, and provided accommodation for 300 boys and 300 girls. Besides the central hall, which was 68 ft. by 30 ft., there were lecture and classrooms and all the accommodation required for the teaching staff and scholars. The classrooms would be heated with open grates, and the central hall, cloak-rooms, corridors, laboratories, lecture-rooms, &c., with hot-water radiators and pipes. The contract price was 16,710*l*., and the total cost, with furniture, &c., would be 19,000*l*.

FIRE STATION, WEST HAMPSTEAD.—On the 24th ult., Mr. J. D. Gilbert, Chairman of the Fire Brigade Committee of the London County Council, laid the memorial stone of a new fire station to be erected by the Council in West End-lane, West Hampstead. The station is to be built on land fronting the old village green of West End. The site cost 1,756*l*. 9s. 10d., and has an area of 16,000 square feet. The cost of the building will be about 11,373*l*. The plans have been prepared by Mr. W. E. Riley, Architect to the Council.

WESLEYAN CHURCH, TANFIELD, BEDALE.—A new Wesleyan church was opened on the 21st ult., at Tanfield, Bedale, the architects being Messrs. W. J. Morley & Son, of Bradford. The building is of stone, in the Decorated Gothic style, with tower and spire. The interior woodwork of pews and of the open wagon-headed roof is of pitch-pine, and the tracery windows are filled with leaded lights, a special feature being a figure window in the transept, which is the gift of Mr. George Bolton, of Bradford. Accommodation is provided for about 205 persons, and there are vestries for the choir and for the minister. From the minister's vestry access is gained to the pulpit. A band room is also provided at the rear of the church, and the old chapel adjoining the new premises will be used as a school.

BALTIC MERCANTILE AND SHIPPING EXCHANGE, LONDON.—The foundation-stone was laid on the 25th ult. of the new building in Jeffreys-square, E.C., of the Baltic Mercantile and Shipping Exchange. The new building will have two frontages, the one in St. Mary-axe of 86 ft. and the other in Bury-street of 72 ft. The Exchange and offices connected therewith will occupy the whole of the ground floor, the principal entrance being in St. Mary-axe, and consisting of an outer arcaded vestibule 32 ft. by 10 ft., and an inner hall 40 ft. long and 24 ft. wide, on either side of which there will be the secretarial offices and boardroom. The Exchange will be 152 ft. long, 94 ft. wide, and 30 ft. high, with a central dome 30 ft. in diameter. On one side of the Exchange there will be a semi-circular bay, containing a staircase leading to the

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basement and the members' cloakrooms, lavatories, &c., and on the other side a similar bay containing twenty telephone boxes. The end of the Exchange will be a semi-circular apse, from which there will be access to Bury-street and entrances to postal and telegraph offices and members' reading-rooms. The basement will be arranged as luncheon and smoking-rooms for the members, with extensive lavatory accommodation, auction and arbitration-rooms, kitchen and offices, and below this there will be a sub-basement, which will be fitted up with the different machinery for the electric light installation, heating, ventilating, pumping, &c. Above the Exchange there will be four floors of offices—about 200 rooms in all—approached by three staircases and electric lifts, two of these to be connected with entrances in St. Mary-axe and one with the entrance in Bury-street. Externally the front facing St. Mary-axe will be in polished granite up to the first floor level, and above this in Portland stone, with polished granite columns. The contractors are Messrs. G. Trollope & Sons, and the architects are Messrs. T. Smith and W. Wimble.

SANITARY AND ENGINEERING NEWS.

KIRKLEE BRIDGE, NEAR GLASGOW.—On the 13th ult. the new bridge which has been erected across the Kelvin to connect Kelvinside with the rapidly-developing district of North Kelvinside was opened. The new bridge was designed by Messrs. Formans & M'Call, engineers, and constructed by Mr. Wm. Wilson. Its erection was begun in the end of 1898. Kirklee Bridge is an elliptical arch with a span of 80 ft. and a rise of 31 ft. 9 in., the soffit of the arch rising to a height of 36 ft. above the bed of the river. The main arch is flanked by two semi-circular arches of 18 ft. span, supporting the approach roads, and the openings afforded by these arches are made use of for carrying the ornamental walks formed in connection with the Botanic Gardens along both sides of the river. The bridge is built at such an elevation as to form a level roadway between Montgomerie-street, in North Kelvinside, and Kirklee-road. The total length of the new connecting roadways is 250 yds., including the bridge. Throughout the bridge and its approaches the carriageway is 30 ft., with a footway on either side of 10 ft.—50 ft. in all. The masonry of the bridge is of Dumfries red sandstone. Polished granite columns are introduced in the pilasters supporting the entablature which carries the polished granite bases of the lamp pillars. The latter, which are not yet in position, are being made of wrought iron. The parapet is also formed of the same polished red granite from the Ross of Mull. The spandrel walls are enriched by the introduction of the city arms carved in relief. In building the wing walls the masonry has been dressed with a rock face, and the slopes dressed off. Apart from the land acquired from the Kelvinside Trustees, the bridge has cost 20,000*l.*, of which the Caledonian Railway Company have given 10,000*l.* The ground in the neighbourhood of the bridge is being laid out as public gardens.

ELGIN WATER SUPPLY.—Mr. Fraser, C.E., Inverness, has recommended a scheme for new water supply for city of Elgin, the high-level works to cost 12,680*l.* and the low-level works 9,770*l.*, together 22,450*l.* Elgin Town Council, however, has resolved that no action be taken on the report, but that negotiations be reopened for a permanent right to the present Blackhills water supply, which is considered ample for all requirements of Elgin.

SEWERAGE, KINGSBURY, MIDDLESEX.—Mr. H. P. Boulnois, Inspector of the Local Government Board, held an inquiry at the Urban District Council's offices on the 19th ult. into the application of the Council to borrow 10,500*l.* for works of sewerage and sewage disposal. Mr. S. Slater Grimley, the Consulting Engineer to the Council, explained the various details of the scheme and the mode of treatment to be adopted at the outfall works, and stated that his scheme was designed for a population of 5,000 and for double-contact bacteria filters after the sewage had been screened and allowed to deposit in tanks, with subsequent filtration through land. The bacteria filters (except the storm water filter) and the tanks were, for financial reasons, omitted from the present application, but five acres of land were proposed to be drained and prepared for irrigation and lateral filtration until the population of the district increased, when the scheme could be completed by the construction of such filters and tanks as designed. At the close of the inquiry the Inspector viewed the proposed outfall works and the routes of the proposed sewers.

FOREIGN.

FRANCE.—The municipality of Ivry (Seine) has just erected an "Ecole Maternelle," the expense of which is estimated at 108,000 francs.——The municipality of Amiens has voted the sum of 315,000 francs for the building of schools.——A new Hôtel de Ville by MM. Defresne and Rousselet has just been inaugurated at Neuilly-en-Thelle (Oise).——The General Council of Civil Buildings has approved of the plan for the future Municipal Casino at Cannes, the expense of which is estimated at over 2,000,000 francs.——The town of Boulogne-sur-Mer has been authorised to vote a sum of 320,000 francs for the building of a school establishment.——The Municipal Council of Bordeaux has approved the project presented by MM. Dalou & Formigé for the monument to be erected to the memory of Gambetta in the Allées de Tourney. Gambetta is represented as standing leaning against a tribune. The pedestal which supports the statue is ornamented with two groups. To the right Wisdom is supporting dying Liberty; to the left a young child is protecting the "Patrie." Palms, garlands, and warlike attributes decorate two sides of the pedestal. The groups of sculpture are to be carried out in white marble.——A sum of 400,000 francs has been voted by the town of Avignon for the construction of barracks, which, let us hope, will ensure the protection of the celebrated palace of the Popes from further injury, and allow of it being put to a better use than it is at present.

GERMANY.—A statue of the Emperor Frederick by the sculptor Johann Boese was unveiled at Oels, in Silesia, on the 27th ult., in the presence of the Duke of Trachenberg, the President of the Province. The statue, about 11 ft. in height, is mounted on a granite pedestal, and represents the late German Emperor in the uniform of his Silesian dragoons.

INDIA.—The large bridge over the Musi River, at Hyderabad, which has taken nearly three years to construct, was opened recently by the Nizam. It is 100 yards in length, and cost 1¼ lakhs of rupees.——The Government of India has sanctioned the installation of the Jewell system of filtration in connexion with the water supply for the civil and military station of Bangalore.——Plans are being prepared for new offices of the Public Works Department, proposed to be built in Colombo, Ceylon.——The Government of India has decided to build a new Foreign Office in Calcutta in close proximity to the new Military Secretariat now under construction.——Extensive additions to the waterworks of the city of Jammu have been sanctioned by the State Council of Jammu and Kashmir State. The plans have been prepared by the State Engineer, Mr. H. S. Wildeblood.——The Eastern Bengal State Railway is making very large additions to its terminal accommodation, and have sanctioned important extensions to the railway station at Naihati.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Barnes-Williams, Ford, & Griffin, architects, of 24, Railway Approach, London Bridge, S.E., have taken city offices at 30, Coleman-street, E.C., the two offices being in communication by telephone.——Messrs. Easton & Co. (late Easton, Anderson & Goolden) have appointed Mr. F. A. Porter, of 13, Queen's-square, Belfast, and 35, Parliament-street, Dublin, as their sole agent for Ireland.——Mr. Silvester Sparrow, artist in stained glass, has changed his address from 2, Talgarth-road, West Kensington, to 43, St. Peter's-terrace, Ravenscourt Park, W.

ASHBURTON MONUMENT, CHARTERHOUSE SCHOOL.—Mr. Howard Ince, the architect of this monument, illustrated in our last issue, would like us to mention that the illustration was from a photograph by Mr. Fry, of Brighton.

HOUSING OF THE WORKING CLASSES (LONDON).—The Four per Cent. Industrial Dwellings Company are about to erect dwelling-houses, having front shops on the ground floor, on the west side of High-street and the south side of Victoria-road, Stoke Newington. The Metropolitan Association for Improving the Dwellings of the Industrial Classes will also erect similar dwelling-houses at the rear of Gibson's Buildings, Northwold-road, in the same parish. In the North Lambeth and Kennington districts the London and South-Western Railway Company have undertaken to provide accommodation for the inhabitants to be dispossessed by their new works in the vicinity of Waterloo terminus by the erection of three blocks of industrial dwelling-houses upon a site lying between Burdett-street and Gloucester-street, together with two more blocks on the north and south sides respectively, of those two thoroughfares. The railway company have also prepared plans and estimates in respect of four similar blocks upon the ground situated between Boniface-street and Lambeth Upper Marsh, Lambeth, with another block on the north side of Upper Marsh, and in respect of four blocks to occupy the site of Nos. 48-72 (even numbers only) inclusive, in South Lambeth-road, Kennington. At their meeting on Wednesday last the St. Pancras Borough Council approved the plans for the erection of a block of dwellings upon the site of the stoneyard in Great College-street, Camden Town.

THE LABOUR MARKET IN THE COLONIES.—According to the July circular of the Emigrants' Information Office (31, Broadway, Westminster), this is the best season of the year for emigration to Canada. There is a good demand for coal and other miners, more especially in British Columbia and Cape Breton, Nova Scotia. There is a fair demand for general labourers, and for certain mechanics, such as carpenters, blacksmiths, and iron and steel workers, but not at St. John, New Brunswick, or at Winnipeg, Manitoba. In New South Wales the dispute in the coal trade has been settled. A report from Sydney states that trade continues good, more especially for plumbers and builders, and the engineering trade has perhaps never been so busy. There is plenty of opening for good artisans in the engineering and general building trades, as well as for general handy men. In Victoria there is practically no demand in Melbourne or the other towns for more mechanics or labourers, unless they are specially skilled, and bring a little money with them. Many unemployed have been provided with work during the last few weeks on railway construction. The Government have decided to spend 16,000*l.* on irrigation works in the Mallee, which will benefit the local farmers, and at the same time provide work for those out of employment in Melbourne; about 300 men are now engaged on piecework at 8d. to 10d. per yard. In South Australia there is practically no demand for more mechanics in the towns, but a skilled hand such as a mason, bricklayer, engine fitter, blacksmith, joiner, or carpenter can generally find employment after looking about for a little. Owing to drought and scarcity of employment, emigrants (other than female servants) are not recommended to go to Queensland at present, unless they receive nominated passages or take a little money with them. In Western Australia, according to the official labour return for the first quarter of 1901, there is no demand for miners anywhere. At Perth and Fremantle and Katanning there is a demand for mechanics in the building and other trades, good men getting constant employment at Perth; but elsewhere the supply is either sufficient or, as at Coolgardie, in excess of the demand. At Jarrahdale there is a steady demand for sawmill hands and fellers. In Tasmania the supply of labour is, generally speaking, equal to the demand. In New Zealand, with the exception of a few places such as Dunedin, where some carpenters and boilermakers have been out of employment, the building and engineering trades have been busy everywhere. In Natal a few guards, engine-drivers, firemen, cleaners, and platelayers are wanted on the railways. Candidates must apply to the Agent-General for Natal, 26, Victoria-street, London, S.W., stating age, height, and experience, and enclose testimonials. Otherwise all persons are again warned against going to South Africa at present in search of professional or manual work unless they have ample private means to meet the very high cost of living. They will not, as a rule, be allowed to proceed up country.

FOWEY HALL, CORNWALL.—Messrs. Arrowsmith & Co. ask us to mention that the solid inch oak floors throughout the above-named house (illustrated in our last issue) were laid and polished by them.

CONFERENCE ON THE HOUSING QUESTION.—A conference of members of the London County Council and delegates from the London Borough Councils was held on the 28th ult. to consider their respective spheres of action under Part III. of the Housing of the Working Classes Act, 1890, as amended last year. Mr. Torrance, Chairman of the L.C.C., presided at the conference, which was held at the County Hall, Spring-gardens. Mr. Waterlow, Chairman of the Housing of the Working Classes Committee of the London County Council, said they would gladly welcome any assistance from the Borough Councils, at whose request the conference was convened. Their object was to avoid all clashing between the various public bodies who had powers under the Act. If judiciously used, their new powers ought to mean some solution of the housing problem, but there were certain risks. The first was that each body would leave its neighbours to do the work, but he believed the public opinion of the metropolis was so roused on the housing question that the risk of falling between thirty different stools might be disregarded. More serious was the risk of several public authorities seeking to acquire the same area of land, and thus putting up the price. He hoped the conference would find a means of avoiding that danger. Then it was said that if all the Councils started building there would be too many houses, but he did not think that was likely to occur for ten years at least. There was an immense demand for working-class houses, and he hoped and believed the Borough Councils were prepared to do all they could to supply that demand. His committee would be glad to give any information, gained by their experience, to assist Borough Councils in putting up dwellings. No doubt the cost of these dwellings was great, and at first there must be a charge upon the rates; but they would have a valuable asset in the land, which would always be worth its price, and at the expiration of the sinking-fund there would be the reversion of a freehold property, producing a large income. There were an immense number of cases of overcrowding, as shown by the census returns, which spoke of five or six, and even ten or twelve, persons living in one room.—Mr. Dickinson moved, as an amendment to a previous resolution:—"That, with a view to obviate any possibility of overlapping or clashing as between the various authorities in London charged with the duty of erecting houses for the working classes under Part III. of the Housing of the Working Classes Act, 1890, as amended by the Housing of the Working Classes Act, 1900, it is expedient that when either the London County Council or any metropolitan Borough Council contemplates acquiring land for the above purpose such Council shall, at the earliest moment consistent with the

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public interest, communicate its intention to the Borough Council within whose area the land in question is situated, and to the London County Council." The amendment was carried and became the substantive motion. It was sharply criticised and eventually defeated. An Islington scheme was accepted as follows:—"That it is desirable, with a view to avoiding dual control and overlapping expenditure, that no scheme for the housing of the working classes in any metropolitan borough should be promoted by either the London County Council or the Council of any metropolitan borough, pursuant to Part III. of the Housing of the Working Classes Act, 1890, except after due consultation between the two Councils (*a*) as to the desirableness of the scheme, and (*b*) in order that the cost of such scheme may be fairly apportioned between the county and the particular borough." Two suggestions from Westminster, proposed by Sir J. Wolfe-Barry, and seconded by Mr. Henry Tozer, were agreed to. They were:—"That, in order to ascertain the immediate responsibility of each Borough Council, a simultaneous special inquiry be made by each Council as to the number of the working class that it may be necessary, by the conditions and circumstances of their employment, to house within the area of each borough," and "that reasonable modifications of the existing building laws and regulations are essential in order to facilitate the further erection of industrial dwellings." The conference was adjourned.

SOCIETY OF ARTS.—The Society of Arts held their annual conversazione this year, on Friday, the 28th ult., as a garden party, at the Botanic Gardens, instead of going as usual to the South Kensington Museum. The night was fine and the affair was a complete success, and a very agreeable variation from the usual programme. The gardens were illuminated in a most liberal and effective manner, the trees appearing to bear a new fruitage of sparkling lights, in addition to the usual array of Chinese lanterns, &c., along the walks. A concert of instrumental music was given in the conservatory at 9, by the string band of the Royal Artillery, and at 10.30 the band of the Grenadier Guards gave a performance on the west lawn, the commencement of which was a little delayed owing to a want for the moment of sufficient lights for the players—a point to be borne in mind on future occasions. A vocal and instrumental concert was given at intervals in the club-house by the Royal Criterion Handbell Ringers and Glee Singers, which was so attractive that the room was filled all the evening and there was an overflow audience round the windows. Refreshments were supplied in the café attached to the club-house, and in marquees on the lawn. Entertainments of this kind are of course so entirely dependent on the weather, that there is always a certain risk in undertaking them; but the result on this occasion was so satisfactory that the Society's guests will probably hope that the risk will be taken again.

CAPITAL AND LABOUR.

GLOUCESTER BUILDING TRADE.—A special meeting of the Master Builders' Association for Gloucester and district was held recently at the New Inn Hotel, to consider a letter received from the Secretary of the Builders' Labourers to the effect that unless something further was done to meet the men's demand for an increase of wages and suggesting arbitration "he was afraid that extreme steps will be taken." The President (Mr. G. O. Estcourt) presided. As the result of their deliberations the following resolution was carried: "That this meeting adheres to the resolution passed at the meeting held on December 17 last, thus leaving nothing to refer to arbitration." The resolution reads as follows: "That the present state of trade does not warrant any increase or promise of increase in the rate of wages of builders' labourers."

TEES-SIDE AND HARTLEPOOLS JOINERS' STRIKE.—A meeting of the Tees-side Master Builders' Association was held at the Y.M.C.A., Stockton, on the 26th ult., to take into consideration the joiners' strike. It was reported that there had been a meeting of the executive of the Northern Centre of the Employers' Federation and the Amalgamated Society of Carpenters and Joiners at Leeds, when the employers had offered to increase the joiners' wages from 9d. to 9¼d. per hour, whilst amongst other things agreeing to pay the actual out-of-pocket lodging expenses of the workmen when on jobs outside their own town. The men had, however, held to their claim of 9½d. per hour, though they had expressed their willingness to accept actual out-of-pocket expenses as an amendment to rule 5, at the same time stating that an adjustment of the Hartlepools walking time might be arranged by a joint local committee as agreed by the employers. After a lengthy meeting the Tees-side employers agreed to abide by the offer of the farthing advance made at Leeds by the executive committee, whose action they confirmed.

SCARBOROUGH STONEMASONS' DISPUTE.—Early this year the operative stonemasons gave six months' notice to the Scarborough Master Builders' Association for an increase of wages from 8d. to 8½d. per hour, and alterations in working rules. The Builders' Association considered the matter, but, taking into consideration the state of the building trade in Scarborough, they decided to offer the operative masons a reduction of ½d. per hour. A deputation from the Master Builders' Association met a deputation of the masons. After due consideration of the matters in dispute, an arrangement was arrived at, the result being that the wages remain as at present, and certain modifications in the working rules were made. This agreement was signed by the two deputations.

STRIKE OF MASONS AT BURTON.—The masons at Burton-on-Trent struck work on the 1st inst. for an advance of 1d. per hour. The present wages are 8½d.

LEGAL.

ACTION BY QUANTITY SURVEYOR AGAINST ARCHITECT.

THE case of Michel *v.* Day came before Mr. Justice Ridley, sitting without a jury in the King's Bench Division on the 26th ult. It was an action brought by Mr. Emile Benjamin Michel, a quantity surveyor, residing at Casewick-road, West Norwood, against the defendant, Mr. R. Philip Day, an architect, to recover 183*l.* 16s. for preparing bills of quantities for proposed additions to St. Paul's Church, Thornton Heath, and a perspective view and specification.

The statement of claim alleged that the defendant, in June, 1900, on behalf of himself, or, alternatively, as agent for and on behalf of principals whom he did not disclose to the plaintiff, and who were unknown to the plaintiff, requested him to prepare bills of quantities for proposed additions to St. Paul's Church, Thornton Heath, and to prepare a perspective view and specification. In compliance with such request the plaintiff prepared the bills of quantities, perspective view and specification, and sent them to the defendant, who accepted the same, and upon them obtained tenders from builders to execute the work. The lowest tender was one of 6,821*l.* 16s. 2d. from Mr. D. Furniss, of Peckham. The plaintiff also, at the request of the defendant, made various alterations in the quantities, and made out a reduced account with additions and omissions, and wrote many letters and paid many visits to the defendant and the church in question. The plaintiff alleged that the usual and proper remuneration for bills of quantities was a commission of 1½ per cent. upon the accepted tender, or the lowest tender, plus out of pocket expenses and remuneration for extra work done.

The defendant, by his defence, denied that he had ever requested the plaintiff to prepare the bills of quantities or to do any of the other work mentioned in the statement of claim for himself (plaintiff), and alleged that in all dealings in reference to the church, the defendant acted as the agent for the Vicar and Building Committee of the church, and in no other capacity, as the plaintiff well knew. He also alternatively pleaded that if he was under any personal liability to the plaintiff, the plaintiff's quantities were incorrect and excessive, whereby the tenders were too high, which caused him (defendant) to employ another quantity surveyor to prepare correct bills of quantities. The defendant further traversed the other allegations in the statement of claim, and alleged that it was verbally agreed between the plaintiff and himself that if a tender based upon the plaintiff's quantities was accepted the plaintiff should receive as remuneration 1½ per cent. commission on the amount of the tender, together with out of pocket expenses, to be paid by the builder whose tender should be accepted; but that if no such tender was accepted, the plaintiff should be entitled to out of pocket expenses only. No such tender, in fact, was ever accepted. The defendant, whilst denying liability, paid 30*l.* into court as being sufficient to satisfy the plaintiff's claim.

Mr. Arthur Powell appeared as counsel for the plaintiff, and Mr. Disney for the defendant.

His lordship, after hearing evidence and the addresses of counsel, in giving judgment said that the only question he felt he had to decide was whether the architect had made himself liable for the employment of the plaintiff as quantity surveyor in the matter in question. The question was, did the defendant as architect contract with the plaintiff without naming his principals? His lordship thought he did not. He thought the true state of things was that when the plaintiff came to Mr. Day he was told by Mr. Day that he was to be employed for the church, and he gave him the name of the vicar and told him that there was a building committee for whom he was acting. According to the ordinary rule, the architect was not the employer of the quantity surveyor. The architect was the person who was avowedly contracting for somebody else. In other words, the architect was simply an agent. He did not say, of course, that in every case where an architect was employed he was entitled to engage a quantity surveyor. Sometimes it was not necessary, the work not being of a sufficiently important description to require it. In the present case the nature of the work was such that quantities were necessary, and from the evidence it was clear that the Building Committee knew that the architect was employing a quantity surveyor. His lordship considered that the plaintiff had no case against the architect, and, therefore, judgment ought to be for the defendant, with costs. He was not able on the other branch of the case to give an opinion as to what should be paid to the plaintiff for his work if the Court of Appeal held that he was in the circumstances entitled to recover from the defendant. If the Court of Appeal should be of opinion that there was a liability on the part of the defendant, then there must be a new trial to ascertain the amount due to the plaintiff, unless the parties could agree to the amount.

His lordship accordingly gave judgment for the defendant on the main point, with costs, and granted a stay of execution pending an appeal to the Court of Appeal.

ACTION BY ELECTRICAL ENGINEERS UNDER A CONTRACT.

THE case of Foote & Milne *v.* Silcock came before Mr. Justice Ridley in the King's Bench Division last week, it being an action by the plaintiffs for 100*l.*, the amount of an unpaid bill (with interest) which had been given by the defendant in connexion with some electrical work carried out at the Star and Garter Hotel, Putney, and flats adjoining. The defendant pleaded that the plaintiffs had not completed the work under their contract, and that consequently consideration for the bill failed. The signature on the bill being admitted,

Mr. Thos. Terrell, K.C., for defendant, said Mr. Silcock was building the hotel in question and a considerable block of flats. Originally tenders had been sought for engines, dynamos, wiring, and, in fact, a complete installation, but the proposals were modified, and the plaintiffs on June 13, 1900, by letter contracted to supply all the necessary mains, distribution boards, switching, wiring, &c., for 440 lamps for 475*l.*, or, if they were to do the cutting away, 485*l.* The terms of payment by the contract were to be by acceptances at three months, to be given when work of that value was completed; and it was further provided "that for the purpose of calculating the value of the work done the branch wiring should be taken at 10s. per light." What the plaintiffs had not done was: (1) They had not put in the distribution boards to go with the mains, the value of which was estimated by defendant's electrical engineer at 51*l.* 2s.; (2) they had not put in seventy-six lights, which, at 10s. per light, making allowance for the mains laid, left work valued at about 58*l.* 18s. to be done. Other parts of the work not absolutely completed would cost 7*l.* 10s., and there was a switchboard for the assembly-rooms which would cost 3*l.* Also there were the arc lamps, with brackets and fixing, which would cost 57*l.*, and the wiring and boards for the same, 6*l.*, fit to be put in. What the plaintiffs had done beyond the contract was to put in extra lights which at 10s. per light would amount to 53*l.* 4s. Taking the balance of the account, the plaintiffs had actually work done representing 344*l.*, and they had already been paid 380*l.*, not counting the 100*l.* on the bill now sued on and in respect of which his case was that they had not done the contract work which alone made the money due.

Mr. J. F. P. Rawlinson, K.C., for the plaintiffs, said that the fallacy in his learned friend's argument was that the work was not complete. The plaintiffs were ready and willing to complete the entire work as soon as they had been paid, as under the contract—viz., 10s. in respect of the branch wiring of each light. They had put in 476 lights, on each of which the payment of 10s. was due.

His Lordship: Unless you can show, Mr. Terrell, that the work has not been done I do not see that you have any answer to the case.

Mr. Terrell pointed out that the mains were not complete or the distribution and switchboards. Was he to pay the entire contract price which this 10s. per lamp worked out to when the work had been only half done, merely because the plaintiffs had put in the branch wiring?

His Lordship: Yes, that is what the contract says. You may have made an improvident bargain, but there it is.

Mr. Terrell argued that the construction his Lordship was putting on the contract was an improper one, and gave the plaintiffs right to payment for the entire contract, though they had completed only a part of it.

His Lordship: I think they are entitled to say, "We have done the branch wiring of so many lights. Therefore you must give us the full amount."

Mr. Terrell: That means I have got, in your Lordship's view, no defence.

His Lordship: That is so.

The case was therefore decided on the point of law on the construction of the contract, and his Lordship entered judgment for the plaintiffs for 100*l.* and costs.

In a second action in respect to a bill of exchange for 30*l.* judgment was also given for the plaintiffs.

Execution was stayed with the view to an appeal on the defendant bringing the money into court.

CONSECRATION OF KILBONANE CHURCH, IRELAND.—The consecration of Kilbonane Parish Church took place on the 25th ult. The new sanctuary is from the design of Mr. William Henry Hill, Cork. It is built of limestone.

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RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

4,053.—APPARATUS FOR DOORS AND GATES: *J. A. Ormc.*—The apparatus for automatically closing and opening the gates and doors of lifts, wells, railway crossings, and so on comprises a hollow sleeve, with ball bearings that project from the cage between brackets, in which are squared holes wherein will slide a rectangular shaft about which the sleeve freely turns. Two side-studs on the shaft engage with two grooves cut in the sleeve, and a spring is inserted between the lower bracket and the enlarged end of the shaft. When the cage has reached a floor it is struck with a foot, which, as it pushes the shaft upwards, causes the sleeve to turn, and so opens the door; but with the ascent of the cage the door becomes closed as the spring presses the shaft downwards again. For gates at railway crossings and elsewhere is devised a rod having spiral grooves that engage with a sleeve which levers will lower and raise.

4,063.—A LIFTING-DOG FOR USE WITH CRANES: *T. B. Mackenzie.*—The inner ends of levers that are pivoted upon a frame are linked to a block in which are pulleys, around which the lifting-ropes are passed; a rope that opens and shuts the dog joins the frame to a pulley, and a third rope from the winding-drum is passed around that pulley, one end of it being secured to another drum which lifts and lowers the pulley for opening and closing the dog.

4,084.—AN APPLIANCE FOR A MITRE PLANING MACHINE: *R. Connor and T. Connor.*—Fences that may be clamped with set-screws receive the mouldings of which the ends are worked with a plane fitted with two irons that are set so as to cut in both directions, a power-driven crank and connecting rod reciprocate the plane.

4,088.—A BAND-SAW SETTING AND SHARPENING MACHINE: *O. C. Pendleton.*—Two spiral files which will sharpen and set the teeth of band-saws at one time are rotated in opposed directions with hand-turned bevel-gearing, as the saw is held at the sides with a pivoted frame, and at the back with an adjustable grooved piece. Cams upon the axis move two pivoted arms which set the teeth, and when one pair of teeth have been filed and set the movement of an inclined plane upon the teeth feeds the saw another step forward.

4,102.—WELL-DOORS OF LIFTS: *H. Kurtzig.*—As the cage approaches a landing in its ascent a spring at its top engages with a catch that projects from the sliding door, which is thereby lifted. With the continued ascent of the cage the catch is forced out of its engagement into a recess in the door, so that the door will fall through its own weight. For the descent of the cage a sliding catch which is fastened to the door with a rope passed around pulleys will engage with a catch underneath the cage.

4,114.—AN ARTIFICIAL STONE FOR BUILDING-BLOCKS, &C.: *A. Denacyer.*—A compound is made of ground sand, gravel, asphalt, lava, granite, porphyry, calcareous stones, sawdust, and similar mineral or organic substances, mixed up with colloidal calcium silicate, which is obtained by the double decomposition of some alkaline silicate with calcium hydrate or chloride, &c.

4,163.—AN ELLIPSOGRAPH: *A. E. Holchkiss.*—In this instrument, which is adapted for both drawing and cutting ellipses, an arm that has two fixed points which will slide along slots cut at a right angle carries the pencil or cutter; a protractor that turns the instrument to one side, together with the axis of the ellipse, through any angle desired, joins the slotted arms. In one shape the extended describing-arm is graduated in both directions from the zero-pivot, in order that when the holder is shifted from one side to the other one may describe ellipses having their principal axes at 90 deg. For describing circles a screw can be depressed into a recess cut in the zero-pivot, and for cutting glass a wheel, or a curved blade, can be fixed to a support; the wheel and two supporting wheels may be mounted upon castor-hangers.

4,166.—A COATING OR MATERIAL FOR FIRE-PROOF AND ACID-PROOF PURPOSES: *E. W. Engels.*—Carborundum, produced with an electrical furnace, is combined with the Dinas stone, firebrick, or other body which is to be treated by means of either rubbing the carborundum into the moulded, but unbaked, articles, or applying it, together with boric acid, water-glass, and so on, to the articles when finished, baked, or dried. For binding purposes the carborundum should be made up with the dolomite, clay, or other materials out of which the bricks or blocks are moulded. (See also No. 24,378 of 1898.)

4,172.—FEED MECHANISM FOR CIRCULAR SAWS: *J. Gruban.*—The side of the wood is pressed against by the feed-roller, which is carried upon the lower end of a vertical axis that is turned with bevel-gearing, and an axis passed through a radial arm from another vertical axis carried by a pedestal attached to the saw-bench and driven with toothed gearing and a belt from the saw spindle. A screw serves for adjusting the length of the radial arm, whilst the axis that is passed through the radial arm slides lengthwise in a pinion. The feed-roller can be set anglewise by turning it about that axis.

4,181.—AN ADJUSTABLE HINGE FOR GATES, DOORS, &C.: *H. A. Eckley and J. Frankham.*—Two pieces constitute that part of the hinge which is clamped on to the foot of the gate-post, and sliding cross-pieces are clamped together in position with a bolt for the adjustment at any distance desired of the jaws which clamp the gate-post. Slotted holes in the jaws admit of the gate being lifted after it has dropped, and there are slots in the jaws and post through which the bolt is passed. In some instances the upper hinge may also be rendered adjustable in the manner described.

4,220.—PIPE-WRENCHES AND SIMILAR TOOLS: *J. H. Condy.*—The jaws are fashioned in one piece with the handles, that are pivoted together with bolts inserted through plates and with a lug that engages with a notch, whilst a sliding-piece fitted with a set-screw holds the handles asunder; a projection from the one jaw fits into a groove cut in the serrated piece, and in one shape the serrated piece or jaw becomes wedged into its place more firmly by means of the action of the projection, which is formed dovetailed in section and tapered lengthwise. The invention includes other modes of keeping the jaws held in position.

4,237.—A COMBINED STRAIGHT-EDGE AND RULE: *T. Berry.*—The two portions of the rule are hinged together so that they can form a square by being set at a right angle, a spring at the hinge keeping them in the position desired; upon one of the arms is mounted a level protected with a shield.

4,244.—THE HARDENING OF BLOCKS MADE OF ARTIFICIAL STONE: *R. Fimmen.*—The hardening chambers are mounted upon trolleys that run upon rails, and clamps secure their removable ends; the pierced steam-pipe is affixed beneath the table upon which the blocks are stacked, and the exhaust steam is conducted from the dome to another hardening chamber; the chambers are run away upon rails when the process has been completed.

4,388.—DRAWING COMPASSES: *E. Boden.*—Screws are used for pivoting the legs in a forked socket, and links join them to the handle which slides within the socket, space being given for the links by means of recesses cut in those parts of the compasses.

4,453.—JUNCTIONS FOR DRAIN AND OTHER PIPES: *J. J. Robins.*—For facilitating the joining of lengths of pipes they are fashioned with flanges (to be fastened with rivets or bolts) that are formed on to a flared-out portion at one end and on to the socket at the other end; the flange at the spigot end of the adjacent length fits into a recess, and the joint is tightened with caulking.

4,460.—ALARMS—FIRE AND BURGLARY: *F. W. Skinner.*—A liquid is filled into the upper one of the two divisions of a reservoir which is carried upon trunnions so that it shall retain a check pawl in gear with the clockwork. With a reduction of the air-pressure in the other and lower division, the liquid will flow through a siphon from the upper division into the lower one, and as the reservoir thereby turns into a vertical position, it liberates the check pawl and sets the clockwork in motion and causes it to turn the arms, upon which are mounted two spring-supported balls which forthwith strike the alarm bell. For the bell may be substituted an electrical bell and the clockwork can be arranged for closing circuit. For a fire-alarm, the pressure in the lower compartment of the reservoir is reduced by means of a piston which a cylinder will draw down as the contained volatile liquid becomes heated, whilst for a burglary-alarm a rod, that is joined to a door or window, is adopted for drawing down the piston.

4,470.—CUTTERS FOR WORKING STONE: *H. Koch.*—By this contrivance a stone-planing machine cutter can be ground upon the machine; bearings upon the cutter-frame hold a shaft upon which are mounted the grinding disc and its pulleys, a holder and blocks or brackets on the table hold the cutter which the table feeds beneath the grinder.

4,495.—COVERINGS FOR WALLS AND CEILINGS: *J. R. Nesbitt.*—Raised ribs that will register with one other as the sheets are laid side by side are embossed or otherwise formed upon sheets of some ornamental material, the ribs have recesses at the joinings of the sheets which take ornamental cone-shaped plugs or buttons to which pins or spikes are affixed.

4,498.—BUTT-AND-FLANGE JOINTS: *A. Barr.*—The invention relates to a coupling for pipes of metal and articles of some such fragile substance as pottery or glass; an india-rubber or other soft piece is fitted on to the pipe or nozzle which is swelled out at its ends, the flanged pipe is joined by drawing the glands or collars together with bolts, one collar may be secured to the flanged pipe, and a separate packing ring can be used between the pipe ends.

4,510.—PARQUETRY FLOORING: *C. Schultze and A. Hartmann.*—Boards or planks, having the annual growth-rings or end-grain exposed for the wearing surface, are made by fastening battens and cubes together; the boards are steeped in linseed oil, and are either secured in position with spikes or loosely laid down upon the girders or joists.

4,533.—A MACHINE FOR PLANING OR FRENCH-POLISHING WOOD: *W. Kerr.*—A slide, which is reciprocated by a crank-disc and a connecting-rod, takes the wood between its two stops; in the case of planing, the wood, as it is moved in one direction, is planed with a hand-plane which is held against a stop-bar; for French polishing the stop-bar is discarded and the workman presses the polishing pad against the board as it is being reciprocated; a radial slot serves for the necessary adjustment of the crank-pin.

4,537.—A BASCULE LIFT-BRIDGE: *J. P. Cowing.*—The axle of each span is adapted to turn in bearings secured to a very strong framework which rests either directly upon the pier or upon a cradle; on the bearing surface of the cradle is a set of rollers, and the larger portion of each roller receives the pressure of the bearing surface of the span; side-plates join the rollers, which are also guided by flanges on the back that is affixed to the bearing surface and is worked with a pinion; a counter-weight is supplied, and an adjustable piece secured to the cradle takes the lower part of the span.

4,552.—JOINTS FOR PIPES: *S. R. Dresser.*—In the case of a spigot and socket joint one section of the pipe is flared at its end in order that it may take a bead upon the other section. The coupling-ring that fits against the bead is tightened with bolts to another ring, whilst a recess in the coupling-ring receives the packing-ring. In a variant shape both the pipes have beads, and coupling-rings bolted together keep a sleeve and the packing-rings in position. For wrought-iron pipes the coupling-rings are not split, and when they have been put around the pipes the beads are spun or formed upon the pipes.

4,567.—A CRAMP FOR WOOD-WORKERS' USE: *J. W. Phillips.*—Two jaws that slide between parallel bars are fixed to cross-bars, one jaw is adjusted with a screw and the other jaw with a pawl that engages with teeth upon the middle bar or otherwise; the base of one jaw is passed underneath the middle bar, bearing against it as pressure is employed, so as to relieve the strain upon the pawl and other portions of the tool.

4,570.—AN APPLIANCE FOR USE WITH CRANES; *W. H. Vaughan and T. Foster.*—For the automatically stopping apparatus of overhead cranes worked with electricity a single-toothed pinion is mounted upon the axle of the barrel of the crane, so that it shall drive a wheel, of which the projecting pin and roller will impinge against and work the cut-out lever in the event of the rope being overwound.

MEETINGS.

SATURDAY, JULY 6.

Institution of Junior Engineers.—Visit to the Staines Reservoirs Works, under the guidance of the joint engineers, Messrs. Walter Hunter and R. E. Middleton, MM.Inst.C.E. Train leaves Waterloo (South-Western Railway) at 1.25 p.m.

St. Paul's Ecclesiological Society.—Visit to the Church and Ancient Rectory House of Southfleet. Train leaves Holborn at 2.25 p.m.

Northern Architectural Association.—Annual excursion, Edinburgh.

MONDAY, JULY 8.

Clerks of Works Association.—(Monthly meeting, Carpenters' Hall). 7.30.

TUESDAY, JULY 9.

British Association of Waterworks Engineers.—Annual general meeting, to be held at Birkenhead.

WEDNESDAY, JULY 10.

British Association of Waterworks Engineers.—Annual general meeting (continued).

THURSDAY, JULY 11.

British Association of Waterworks Engineers.—Annual general meeting (continued).

FRIDAY, JULY 12.

British Association of Waterworks Engineers.—Annual general meeting (concluded).

SATURDAY, JULY 13.

Architectural Association.—Visit to Medmenham Abbey, &c., and "Danesfield," Great Marlow, by permission of the architect, Mr. W. H. Romaine-Walker.

Institution of Junior Engineers.—Visit to the Millwall Lead Works. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 15.—By EDWARD BOND (at Aylesbury).
Waddesdon, Bucks.—Blackington Ground and Cowley's enclosure, 19 a. 0 r. 23 p., f..... £1,150
June 21.—By EDWARD BOND (at High Wycombe).
Princes Risborough, Bucks.—Speen Farm, 145 a. 0 r. 27 p., f..... 1,750
By G. B. HILLIARD & SON (at Chelmsford).
Great Baddow, Essex.—Carlton Villa and 13 a. 1 r. 12 p., f..... 1,180
A freehold cottage and garden 115
June 22.—By JOHN E. EVANS (at Stafford).
Doxey, Staffs.—Aston Farm, 128 a. 2 r. 15 p., f... 4,000
June 24.—By BRACKETT & SON.
Tunbridge Wells, Kent.—Rusthall Common, a plot of building land, area ¼ acre, f..... 150
Nevill Park, Sandfield and 2 a., u.t. 53 yrs., g.r. 30*l.*, r. 230*l.* 3,500
By CHANCELLOR & SONS.
Putney.—18 and 19, Stratford-grove, u.t. 48½ yrs., g.r. 6*l.*, r. 54*l.*..... 365
By DAVID J. CHATTELL.
Chislehurst, Kent.—Mead-rd., a plot of building land, area ½ a., f. 400
Twickenham.—Ailsa-rd., an enclosure of land, 0 a. 3 r. 24 p., f..... 850

[*See also next page.*

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By A. P. CLEAR.
Mayland, Essex.—Nipsell's Farm, 613 a. 3 r. 30 p., f. £3,900

By H. J. CHEFFINS.
Debden, Essex.—New Amberden Hall Farm, 129 a. 2 r. 33 p., f. 2,050
Purleigh, Essex.—Dyegood's Farm, 123 a. 2 r. 38 p., f. 1,380

By EASTMAN BROS.
Sydenham.—Silverdale, Farleigh, f., e.r. 85*l.* 1,375
Forest Hill.—2, Church-rd., u.t. 68 yrs., g.r. 14*l.*, r. 6o*l.* 400

By GIDDY & GIDDY.
Pinkney's Green, Berks. — Ditton House and 20 a., f. 10,700

By NEWMAN & NEWMAN (at Bourton-on-Water).
Turkdean, Glos.—Drapers House and 2 a. 1 r. 22 p., f. 175

June 25.—By ALCE & HARTLEY.
Chiswick.—The Avenue, Erpingham, f. 2,000
Southall, Middx.—Grove House and 1 a., f., e.r. 90*l.* 1,500

By PERCY H. CLARKE.
Hadley Woods, Middx.—Camlot Way, freehold building land, 4 a. 4,000

By DEBENHAM, TEWSON & Co.
Chelsea.—2, 3, 4 and 5, Caroline-pl., f. 1,340

By HAMPTON & SONS.
Wincanton, Somerset.—New Barn Farm, 121 a. 3 r. 35 p., f. 5,500

By MARK HUBBARD.
Kentish Town.—31 to 37 (odd), Dartmouth Pk.-rd., u.t. 61 yrs., g.r. 33*l.* 12s., r. 210*l.* 2,000
York-rise, a plot of land, with shed thereon, u.t. 61 yrs., g.r. 1*l.*, r. 15*l.* 225

By MAPLE & Co.
Hampstead-rd.—37, Oakley-sq., u.t. 53 yrs., g.r. 23*l.*, r. 65*l.* 400

By MORLEY PHILLIPS, SONS, & MARTIN.
Blackheath.—54, Tranquil-vale, u.t. 82 yrs., g.r. 80*l.*, r. 80*l.* 590
Bermondsey.—7 and 9, Alscot-rd., u.t. 20 yrs., g.r. 5*l.* 16s. 8d. 330

By ROGERS, CHAPMAN & THOMAS.
Belgravia.—15, Lowndes-st., u.t. 27½ yrs., g.r. 5*l.*, r. 150*l.* 1,860

By G. TROLLOPE & SONS.
Pall Mall.—24, Carlton House-ter., u.t. 25 yrs., g.r. 30*l.* 2s. 6d. } £13,000
Trafalgar-sq.—5, St. Martin's-mews, u.t. 25 yrs., g.r. 15*l.* 15s. }

By WALTON & LEE.
Mayfair.—17A, 19, and 22, South Audley-st., and 35A, South-st., u.t. 74 yrs., g.r. 400*l.*, r. 1,360*l.* 12,600
Lindfield, Sussex.—The Sunte Estate, 184 a. 2 r. 28 p., f. 18,000
Enclosures of land, 25 a. 2 r. 16 p., f. 3,250
Oak Cottage and o a. 1 r. 36 p., f. 330
Little Sunte Holding, o a. 2 r. 38 p., f. 450
Wraysbury, Bucks.—Hythe End-lane, two blocks of freehold building land, 8 a. o r. 17 p. 860

By FREDK. WARMAN.
Canonbury.—85 and 87, Marquis-rd., u.t. 45 yrs., g.r. nil, e.r. 140*l.* 1,200
Highbury.—30, Highbury-hill, u.s. 56 yrs., g.r. 19*l.* 10s. 1,030
Islington.—34, Britannia-row, c., e.r. 30*l.* 300

By ALFRED RICHARDS (at Tottenham).
Tottenham.—112 and 114, Northumberland Park, f., r. 64*l.* 990
Northumberland Park, a block of freehold building land 1,500
24, Northumberland-grove, u.t. 49 yrs., g.r. 4*l.* 10s., r. 19*l.* 170
Markfield-rd., a freehold building plot 100
61 and 63, Somerset-rd., f. 530

By HEPPER & SONS (at Leeds).
Leeds.—8, Lower Head-row and 1, Atkinson's-court, area 478 yds., f., r. 170*l.* 4,250
Joseph-st., the Hunslet Shed Works, area 2,300 yds., f. 2,760
Shadwell, Yorks.—Beachwood Farm, 14 a. 3 r. 35 p., f. 1,200

June 26.—By DYER, SON, & HILTON.
Eltham, Kent.—Grove Pk.-rd., a block of freehold building land 1,300
Blackheath.—98, Shooters' Hill-rd., u.t. 58½ yrs., g.r. 9*l.*, r. 55*l.* 450
Lewisham.—27, Lewisham Pk., u.t. 73 yrs., g.r. 9*l.* 750

By HY. HOLMES & Co.
Euston-rd.—7, 9, and 11, Stanhope-st., and 28, Seaton-st., u.t. 10½ yrs., g.r. 145*l.* 450

By E. HOLSWORTH.
Victoria Pk.—1 and 2, Comboss-rd., u.t. 60 yrs., g.r. 9*l.* 9s. 375
Shoreditch.—1, Strout's-pl., f. 280

By MANSELL & ROWE.
Norwood.—8, Farquhar-rd., u.t. 35½ yrs., g.r. 15*l.* 12s. 6d., r. 85*l.* 825

By OGDEN, SONS, & OLLEY.
Wimbledon.—13, Pepy's-rd., u.t., 90 yrs., g.r. 10*l.*, r. 40*l.* 400
25 and 27, Palmerston-rd., f. 660
Ridley-rd., a plot of building land, f. 180

By ALFRED RICHARDS.
Tottenham.—837, High-rd., f., r. 30*l.* 630

By WALTER SIMMONDS.
Camberwell.—75, Crofton-rd., u.t. 65½ yrs., g.r. 6*l.* 6s., r. 36*l.* 340

By R. TIDEY & SON.
Canonbury.—11, Marquis-rd., u.t. 44 yrs., g.r. 10*l.*, e.r. 70*l.* 550

By DOUGLAS YOUNG & Co.
Pimlico.—39, Hanover-st., u.t. 23¾ yrs., g.r. 7*l.* 7s., r. 52*l.* 10s. 370
Paddington.—12, Newton-rd., u.t. 19 yrs. g.r. 8*l.* 8s., r. 55*l.* 390
35, Sutherland-pl., u.t. 44½ yrs., g.r. 10*l.* 10s., r. 50*l.* 850
Pentonville.—40, 48, and 50, Great Percy-st., u.t. 15½ yrs., g.r. 22*l.*, r. 150*l.* 370
2 and 3, Upper Baker-st., u.t. 10½ yrs., g.r. 10*l.*, r. 78*l.* 785
De Beauvoir Town.—4 and 6, Church-rd., u.t. 11¼ yrs., g.r. 9*l.*, r. 78*l.* 250
Brixton.—174, Loughborough-rd, r. 36*l.*; also l.g.r.'s 26*l.*, u.t. 20¾ yrs., g.r. 34*l.* 335
1 and 3, Millbrook-rd., u.t. 20¾ yrs., g.r. 10*l.*, r. 60*l.* 235
South Lambeth.—Mawbey-st., f.g.r.'s 88*l.*, reversion in 60 yrs. 320

By WYATT & SON (at Chichester).
Singleton, Sussex.—A freehold shop, two cottages, store, &c. £2,374
A freehold shop, cottage, and meadow 400
255

By LOUND & HOWITT (at Horseshoe Hotel).
Clapham.—The Common, The Windmill p.-h., a building lease of 50 yrs., r. 500*l.*, with goodwill 4,500

By HEPPER & SONS (at Boston Spa).
Boston Spa, Yorks.—High-st., The Beeches and 2 a. o r. 29 p., f. 1,330
High-st., Low Ox Close, 2 a. 2 r., f. 350

By HEPPER & SONS (at Leeds).
Leeds.—61 and 63, Whitehouse-st., and 22, Turkey st., f. 600

By BIDDELL & BLENCOWE (at Bury St. Edmunds).
Whepstead, Suffolk.—Whepstead Hall and New House Farms, 441 a. 3 r. 26 p., f. 5,350
Wattisham, &c., Suffolk.—The Wattisham Estate, 221 a. 1 r. 27 p., f. and c. 2,323
Great Bricett, &c., Suffolk.—The Bricett Estate, 182 a. 3 r. 36 p., f. and c. 1,775

June 27.—By H. J. BLISS & SONS.
Woolwich, Kent.—Beresford-st., f.g.r.'s 26*l.*, reversion in 22 yrs. 1,290
Beresford-st., f.g.r. 58*l.*, reversion in 22 yrs. 2,150
Beresford-st., f.g.r. 12*l.* 7s. 6d., reversion in 38 yrs. 345
Beresford-st., f.g.r.'s 29*l.* 5s. 3d., reversion in 22 yrs. 1,205

By DEBENHAM, TEWSON, & Co.
South Kensington.—26, Egerton-cres., u.t. 26 yrs., g.r. 10*l.* 1,410

By H. DONALDSON & SON.
Bishopsgate.—5 to 14, New-st., f. 5,000
Mile End.—39, 41, and 43, Willow-st., u.t. 29 yrs., g.r. 6*l.* 715

By E. M. DUNCOMBE.
Brompton.—1 to 6, Middle-st., u.t. 24½ yrs., g.r. 27*l.* 630

By G. H. MASTERMAN & Co.
Highgate.—Merton-lane, Merton Lodge and over 2 a., f., r. 250*l.* 5,200

By MAY & PHILPOT.
Clapham.—South-rd., Ben Omar and 1 a., f. 2,500
Brixton.—87, St. James-rd., u.t. 61½ yrs., g.r. 8*l.* 10s. 595

By C. C. & T. MOORE.
Hackney-rd.—173, Gt. Cambridge-st.; also Kent Wharf, f., r. 150*l.* 3,550
53 to 59 (odd), Holms-st., area 5,200 ft., f. 1,910
Hackney.—11 to 17, Exmouth-pl., f.; 18, Exmouth-pl., area 2,200 ft., f., r. 45*l.* 2,250
Haggerston.—58, Moye-st., and 25 and 26, Talavera-pl., f. 750
Mile End.—470, 474, 476, and 478, Mile End-rd., f., r. 144*l.* 2,820
Loughton.—High-rd., Osborn House and 2 a., f. 1,800
Bethnal Green.—19 to 27 (odd), Granby-st., u.t. 17½ and 20½ yrs., g.r. 32*l.* 270
Chelsea.—110, Cheyne-walk, f., e.r. 60*l.* 1,000

By NEWBON, EDWARDS, & SHEPHARD.
Pentonville.—4, 6, and 7, Lloyd-sq., u.t. 16 yrs., g.r. 18*l.*, r. 146*l.* 800
Canonbury.—39, Alwyne-rd., u.t. 44 yrs., g.r. 10*l.*, e.r. 65*l.* 470

By NOTLEY & Co.
Stockwell.—Binfield-rd., Berkeley House, u.t. 35 yrs., g.r. 20*l.* 1,000
Clapham.—12, Rusham-rd., f., r. 45*l.* 800

By STIMSON & SONS.
Lambeth.—27 and 28, Lower Marsh, f. 2,250
South Lambeth.—167 to 175 (odd), South Lambeth-rd. (one with off-licence), u.t. 45 yrs., g.r. 36*l.*, r. 340*l.* 3,740
Balham.—Boundaries-rd., Cecil House, u.t. 95 yrs., g.r. 6*l.* 6s., e.r. 36*l.* 330
Mile End.—1, Cornwall-rd., and 1, 2, and 3, Cornwall-sq., f. 745
Bermondsey.—122, Spa-rd., area 30,500 ft., f.r. 41*l.* 7,750
Spa-rd., The Crown p.-h. and plot of land in rear, f., r. 75*l.* 3,370
Dunlop-pl., freehold manufacturing premises, area 39,000 ft., r. 350*l.* 5,450

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 14 0	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 11 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 8 0	" " "
Flettons	1 8 6	" at railway depot
Red Wire Cuts	1 14 6	" " "
Best Fareham Red	3 11 0	" " "
Best Red pressed Ruabon Facing.	5 5 0	" " "
Best Blue Pressed Staffordshire	4 4 6	" " "
Do., Bullnose	4 9 0	" " "
Best Stourbridge Fire Bricks	4 2 6	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£ s. d.	
Double Headers	16 0 0	per 1,000 at railway depôt.
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
plays, Chamfered, Squints	14 0 0	" " "
Seconds Quality White and Dipped Salt Glazed	8 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	35 0	per ton, delivered.
Best Ground Blue Lias Lime	25 6	" "

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime 12s 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath "	1 7	" "
Farleigh Down Bath	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks	2 1½	" "
Red Corsehill "	2 5	" "
Red Mansfield "	2 4½	" "
Hard York in blocks	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt
" " 6 in. Rubbed Ditto	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" " 2 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.
" " " 6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
" " " 3-in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep.
" best seconds	10 15 0	" "
16×8 best "	6 6 6	" "
20×10 best blue Portmadoc	10 18 0	" "
16×8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green	11 2 6	" "
16×8 " "	6 15 0	" "
20×10 Permanent green	10 0 0	" "
16×8 " "	5 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt.
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	48 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. ornamental Do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0	
Deals: best 3 by 9	13 10 0	14 10 0	
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0	
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.	
Deals seconds	1 0 0	less than best	
Battens: seconds	0 10 0	" " "	
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0	
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0	
Foreign Sawn Boards— 1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.	
¾ in.	1 0 0	more than battens.	

	At per load of 50 ft.	
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	19 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
" " 3 in. by 9 in.	19 0 0	20 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 0 0	16 0 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0

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PRICES CURRENT (*Continued*).

WOOD.	At per standard. £ s. d.	£ s. d.
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 10 0	15 10 0
Second yellow deals, 3 in. by 11 in.	16 10 0	17 10 0
Do. 3 in. by 9 in.	15 0 0	16 0 0
Battens	12 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	11 10 0	12 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in..	15 0 0	16 0 0
,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	26 0 0	30 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	8 0 0
Compound Girders ,, ,,	9 0 0	10 5 0
Angles, Tees and Channels, ordinary sections	8 17 6	10 17 6
Fitch Plates	9 0 0	9 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	15 5 0	- - -
Pipe in coils	15 15 0	- - -
Soil Pipe..	18 5 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 0 0	- - -
Silesian	23 10 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,, ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 5	- - -
SOLDER—Plumbers' ,,	0 0 7	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

PRICES CURRENT (*Continued*).

PLASTER, &c.	s. d.	
Coarse Plaster	30 0	per ton delivered.
Fine ,,	38 0	,, ,,
Coarse Keenes and Parian cement	51 6	,, ,,
Fine do. do.	59 6	,, ,,
Robinson's Fireproof Cement..	51 6	,, ,,
Do. Finishing ,, .. (Exclusive of the ordinary charge for sacks.)	56 6	,, ,,
Whiting	30 0	,, ,,

ENGLISH SHEET GLASS IN CRATES.		
15 oz. thirds	3d.	per ft. delivered.
,, ,, fourths	2¾d.	,, ,,
21 oz. thirds	3¾d.	,, ,,
,, ,, fourths	3½d.	,, ,,
26 oz. thirds	5d.	,, ,,
,, ,, fourths	4½d.	,, ,,
32 oz. thirds	6d.	,, ,,
,, ,, fourths	5½d.	,, ,,
Fluted sheet, 15 oz.	3½d.	,, ,,
,, ,, 21 ,,	4½d.	,, ,,
½ Hartley's Rolled Plate	3d.	,, ,,
⅜ ,, ,, ,,	3½d.	,, ,,
½ ,, ,, ,,	4d.	,, ,,

OILS, &c.	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 10
,, ,, ,, in barrels ,,	0 2 11
,, ,, ,, in drums ,,	0 3 1
Boiled ,, ,, in pipes ,,	0 3 0
,, ,, ,, in barrels ,,	0 3 1
,, ,, ,, in drums ,,	0 3 3
Turpentine, in barrels ,,	0 2 4
,, in drums ,,	0 2 6
Genuine Ground English White Lead ...per ton	23 0 0
Red Lead, Dry ,,	24 0 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 10 0

VARNISHES, &c.	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 18 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BANBURY.—For the erection of school buildings, Britannia-road. Mr. W. F. Bird, architect, Midsomer Norton, Somerset. Quantities by the architect:—

Kingerlee & Sons	£5,150 0 0	Kimberley	£5,022 0 0
Bloxham	5,099 0 0	J. F. Booth	5,000 0 0
Grant & Son	5,079 17 0	W. J. Harding	4,786 12 6
		Orchard & Son	4,725 0 0

BARNSLEY.—For the erection of twenty-five houses, &c., near Little Houghton, for the Houghton Main Colliery Company, Limited. Mr. W. J. Sykes, architect, Hoyland, near Barnsley:—

Masonry, &c.

Wm. Johnson, Wombwell, near Barnsley*	£3,169 0 0
Joinery, &c.	
James Taylor, Darfield, near Barnsley*	935 0 0
Slating and Plastering.	
M. Fleming, Eastgate, Barnsley*	701 0 0
Plumbing and Glazing.	
W. H. Rawlin, Hoyland, near Barnsley*	173 19 0
Painting.	
F. C. Wilson, Wombwell, near Barnsley*	92 0 0
Total	£5,071 8 0

BATLEY (Yorks).—For the erection of a long wooden bridge, Wellington street, for the Town Council. Mr. O. J. Kirby, C.E., Town Hall, Batley. Quantities by the Engineer:—

T. E. Sugden	£250 0	Akeroyd & Son	£199 0
H. Brook	245 0	Chadwick & Sons, Batley*	189 10

[Engineer's estimate £180.]

BIRMINGHAM.—For the erection of thirty-seven artisans' dwellings near Cannon Hill Park, Birmingham, for Messrs. Freeman, Thomas, & Elsmore. Mr. W. J. Ballard, architect, Willous-road, Birmingham:—

Hughes & Son	£9,050 0	C. R. Webb	£8,283 0
R. Rutty	8,510 0	W. C. Channing	7,972 0
Cragg & Co.	8,454 10	H. S. Bevins*	7,535 0

For Manholes and Main Drain for the Above.

Abel Cooper	£225 0 0	Geo. Trentham	£137 7 0
John White, jun.	200 0 0	S. Woods*	131 2 3
Channing & Co.	198 10 0		

CORK.—For stabling in Bishop-street, Cork, for Messrs. Beamish & Crawford, Limited, brewers, Cork. Messrs. Houston & Houston, architects, 5, York-buildings, Adelphi, W.C. Quantities by Mr. A. E. McEwan Waghorn, surveyor, 10, Craig's court, Charing Cross, S.W.:—

E. & P. O'Flynn	£7,830	John Lisk	£6,200
J. & P. Good, Ltd.	7,150	Samuel Hill*	6,035
Delaney & Co.	6,694		

EWELL.—For a small summer residence at Ewell, Surrey, for Mr. Ambrose Paterson. Mr. H. G. Quartermain, architect, Merton:—

Jones & Son	£1,467	Newton & Co.	£1,205
Price & Price	1,350	Jas. Burges & Son	1,185
C. King & Son	1,263	Rice	1,125
Battley, Son, & Holness	1,255		

LONDON.—For the erection of two small houses in Upper Tooting-park, S.W. Mr. William Hunt, architect, Donington House, Norfolk-street, Strand, W.C.:—

W. & C. Brown, 1, Inman-road, Wandsworth* (tender on amended plans) £1,616

LONDON.—For repainting the ironwork and woodwork of the bridges and pontoons at Woolwich Ferry, for the London County Council:—

J. F. Holliday	£2,153 4 5!	A. H. Inns	£984 6 0
W. R. Athey	1,311 15 11	H. C. Horswill	926 0 0
E. Proctor	1,099 0 0	Vigor & Co.*	786 5 7!

LONDON.—For the erection of a chimney shaft, for the Guardians of the Greenwich Union. Mr. L. Jacob, architect and surveyor, Globe Chambers, 493, New Cross-road, S.E.:—

A. Wilson	£357 11 7	W. Martin	£255 0 0
E. Mills	277 0 0	W. Mills	253 0 0
W. Nash	275 0 0	H. Groves	223 0 0
H. L. Holloway	267 0 0	Hall Bros.	177 0 0
Neil & Co.	260 0 0		

LONDON.—For sewerage work, Page's-lane, Muswell Hill, for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor:—

Myers, Gilson, & Rose, Ltd.	£517 3 3	S. Saunders	£420 0 0
J. A. Dunmore	458 2 5	Williamson & Sons, Ltd., Finsbury Pk., N.*	350 17 7
E. T. Bloomfield	448 11 0		
Thos. Adams	444 3 11		

LONDON.—For the making up of Priory-avenue, for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor:—

E. T. Bloomfield	£1,388 19 10	Wallace & Inns	£1,212 11 6
Griffiths & Co., Ltd.	1,320 14 0	J. A. Dunmore	1,181 9 10
Williamson & Sons, Ltd.	1,313 14 11	Thomas Adams, Wood Green, N.*	1,176 2 11
Myers, Gilson, & Rose, Ltd.	1,232 19 9		

LONDON.—For making up of Eastwood-road, for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor, Hornsey District Council:—

E. T. Bloomfield	£671 17 11	Myers, Gilson, & Rose, Ltd.	£602 6 4
Griffiths & Co., Ltd.	659 3 4	Thomas Adams	596 2 8
J. A. Dunmore	640 2 8	Wallace & Inns, Hornsey Railway Station, N.*	584 4 5
Williamson & Sons, Ltd.	631 5 6		

REDHILL.—For additions and alterations to Holly Bank, Red Hill, for Mr. G. W. Peat. Mr. C. E. Salmon, architect, Bell-street, Reigate:—

Buckland & Waters	£298	G. Martin, Red Hill*	£284
Nightingale & Sons	289		

TYLORSTOWN (Glam).—For the erection of three houses for Mr. D. Evans, Duke of York Hotel. Messrs. Griffith & Jones, architects, Tonypandy & Cardiff:—

Morris Morris, Ferndale, nr. Pontypridd* £632

WORKSOP.—For the erection of new workhouse infirmary, for the Guardians of the Worksop Union. Mr. Herbert C. Scaping, architect, Grimsby. Quantities by Mr. J. Watson, Hull:—

Thos. Roper	£19,949 10 0	G. G. Middleton	£15,950 0 0
J. G. Cooling	17,880 14 6	Cooper & Son, Ltd.	15,616 0 0
Brown & Son	17,400 0 0	Gill, Dennis, & Son	15,577 0 0
Longden & Son	17,020 12 6	J. H. Vickers, Ltd.	15,490 0 0
Wm. Hall	16,980 0 0	A. B. Clarke, Nottingham*	14,500 0 0
Hy. Vickers	16,900 0 0		
Cahill & Leverton	16,494 0 0		
Robt. Stewart	16,130 0 0		
M. Grantham	16,100 0 0		

[*See also next page.*

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Road Stone (4,500 tons)	Leamington Corporation	H. C. Passman, Town Hall, Leamington	July 8
Well Sinking	Strabane (Ireland) R.D.C.	J. E. Sharkie, Council Offices, Strabane	July 9
Art Gallery and Library Extension	Rochdale Corporation	J. Horsfall, Architect, Todmorden	do.
Building Works at Cattle Market	Newbury Town Council	S. J. L. Vincent, Borough Surveyor, Town Hall, Newbury	do.
Bacteria Tanks, Filters, &c.	Barnard Castle R.D.C.	J. E. Parker, Civil Engineer, Post Office Chambers, Newcastle	do.
Bacteria Beds, Haslemere	Hambledon R.D.C.	J. H. Howard, Surveyor, Lower-street, Haslemere	July 10
Reservoir, Batworth Park, Littlehampton	.....	H. Howard, Engineer, Town Offices, Littlehampton	do.
Bridge over River Braan, near Dunkeld	.....	G. A. Mackenzie, British Linen Bank House, Perth	do.
Laundry Buildings, Chippenham, Wilts	Sanitary Laundry Co., Ltd.	T. Stacey, St. Mary's-street, Chippenham	do.
Workshops, Stores, &c., Newton-road	Rushden (Northants) U.D.C.	W. B. Madin, Civil Engineer, Surveyor, Vestry Hall, Rushden	do.
Additions to Workhouse, Grenoside	Wortley Guardians	G. A. Wilde, Architect, Bank-street, Sheffield	do.
Work at Municipal Buildings	King's Lynn Corporation	H. J. Weaver, Civil Engineer, Town Hall, King's Lynn	do.
Additions to Schools, Pontypool	.....	B. Lawrence & Son, Architects, Newport	do.
Cemetery Walls, &c.	Birkdale (Lancs) U.D.C.	J. Smallshaw, Town Hall, Birkdale	do.
Lavatory Works, &c., Crumpsall	Manchester Guardians	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	do.
Covered Reservoir, Littlehampton	.....	H. Howard, Engineer, Town Offices, Littlehampton	do.
Drainage, &c., at Workhouse	Navan (Ireland) Guardians	A. Scott, Architect, Board Room, Navan	do.
Additions, &c., to Thornham House, Devon	Mr. W. D. Pearse	Mr. Barrows, Weir View, Totnes	do.
Quartzite, Ragstone, &c.	Gillingham (Kent) U.D.C.	F. C. Boucher, Council Offices, New Brompton	July 11
Alterations, &c., to Town Hall	Haslemere Parish Council	J. Howard, Surveyor, Lower-street, Haslemere	do.
Steam Laundry Buildings	Clevedon (Som.), &c., Laundry Co.	T. J. Moss-Flower, Civil Engineer, 28, Baldwin-street, Bristol	do.
*Portland Cement	Croydon Borough Council	Town Hall, Croydon	July 12
*Coastguard Buildings, Pennan, Aberdeenshire, N.B.	Admiralty	Clerk of Works, Maybank, Broughty Ferry, N.B.	do.
Reservoir, High-lane, Ridgway	Chesterfield R.D.C.	J. Frith, Engineer, Baslow, via Chesterfield	do.
Kerbing, Paving, &c., near Birmingham	Yardley R.D.C.	A. W. Smith, Surveyor, Sparkhill, Birmingham	do.
*Reconstruction of Mews Bridge	Southampton Corporation	County Surveyor, The Castle, Winchester	July 13
Additions to Schools	Church Coppenhall (Cheshire) S.B.	J. A. Atkinson, 18, Hightown, Crewe	do.
House, Finsthwaite	Misses Coward	J. Coward, Stott Park Mill, Lake Side	do.
House, Ellistones, Greetland, Halifax	.....	Walsh & Nicholas, Architects, Halifax	do.
Villa, Greenroyd Estate, Halifax	.....	G. Buckley & Son, Architects, Tower Chambers, Halifax	do.
Pier Extension, Islay, N.B.	.....	J. Laughton, Ballabus, Bridgend, Islay	do.
Seven Cottages, Auldearn	.....	R. & R. Urquhart, Forres	do.
Shedding, &c., Chester	Cheshire Agricultural Society	T. A. Beckett, St. Werburgh's Chambers, Chester	do.
Cottage, The Close, Warminster, Wilts	Mr. W. F. Morgan	W. H. Hardick, Architect, High-street, Warminster	do.
Slaughter-house	Hexham U.D.C.	R. T. Surtees, Council Offices, Hexham	do.
Additions to School	Sale (Cheshire) U.D.C.	W. Holt, Engineer, Council Offices, Sale	do.
Two Villas, Rhymney, Wales	.....	Smith & Davies, Architects, 50, High-street, Merthyr Tydfil	do.
Four Villas, Rhymney	Mr. D. Joseph	do.	do.
Road and Sewer Works, Eastern Drive, &c.	Garston (Lancs) U.D.C.	F. W. Bowden, Civil Engineer, Public Offices, Grassendale	July 14
Sewerage Works, Castle Ward	Northwich U.D.C.	H. Bancroft & Son, Civil Engineers, 8, Mosley-street, Manchester	July 15
Granite Road Metal	Bedford Corporation	T. S. Porter, Town Hall, Bedford	do.
Underground Conveniences	Leeds Corporation	City Engineer, Municipal Buildings, Leeds	do.
Kerbing, Paving, &c., Hemel Hempstead	Herts County Council	U. A. Smith, Surveyor, 41, Parliament-street, S.W.	do.
Long Brick Wall at Asylum, Bootham, York	.....	Demaine & Brierley, Architects, Lendal, York	do.
Banking Premises, Park Row, Leeds	.....	Oliver & Dodgshun, Architects, Park-square, Leeds	do.
Several Cottages, Trealaw, Wales	Ynyscynon Building Club	A. O. Evans, Architect, Pontypridd	do.
*Engine and Boiler House, &c.	Erith U.D.C.	W. Egerton, 12, Queen's-road, Erith	do.
*Iron and Steel Balconies	Kingston Union	W. H. Hope, Architect, Hampton Wick	July 16
*Additions to Nurses' Home	do.	do.	do.
Providing and Laying Pipe Sewers	Godstone R.D.C.	T. C. Barralet, Surveyor, Council Offices, New Oxted	do.
Sea Wall, North Denes	Lowestoft Town Council	W. T. Douglass, Engineer, 15, Victoria-street, S.W.	July 17
*Extension to Hospital, Seacroft	Leeds Corporation	E. T. Hall, Architect, 54, Bedford-square, W.C.	do.
Road Stone	Winsford U.D.C	H. Hulse, Surveyor, Winsford	do
*School, &c.	Swindon School Board	See Advertisement	July 18
Granite Road Metal	Braintree U.D.C.	H. H. Nankivell, Surveyor, Vestry Hall, Braintree	do.
Stoneware Pipe Sewers, &c.	Bridlington Town Council	E. R. Matthews, Civil Engineer, Town Hall, Bridlington	July 20
Road Works, Monins-road	Dover Town Council	H. E. Stilgoe, Civil Engineer, Town Hall, Dover	July 22
*Medical Officer's Residence	Poplar Union	J. & S. F. Clarkson, 136, High-street, Poplar, E.	July 24
Steel Swingbridge, Grangemouth, N.B.	Caledonian Railway Company	Sir J. Wolfe Barry, Civil Engineer, 21, Delahay-st., Westminster	July 29
*Infirmary	Cannock Union	Ashton Veall, 84, Darlington-street, Wolverhampton	July 30
*Nurses' Home, &c.	Chester County Asylum	County Architect, Newgate-street, Chester	Aug. 1
*Sewers	Stroud R.D.C.	Council Offices, John-street, Stroud	do.
*Electric Lighting	Brecon and Radnor Joint Asylum	Giles, Gough & Trollope, 28, Craven-street, Strand	Aug. 5
*Library, &c.	Isle of Wight County Council	See Advertisement	do.
*Alterations, &c., to School	Watford School Board	C. P. Ayres, Burvale, Watford	No date
Three Tenements, Bruntsfield, N.B.	.....	R. & T. Watson, Surveyors, 5, York-place, Edinburgh	do.
Pennant Stone Kerbing and Laying (2,000 ft.)	Monmouthshire County Council	W. Tanner, County Surveyor, Newport, Mon	do.
Club Buildings, Moston, Lancs	.....	S. M. Chadwick, Civil Engineer, Chapel Walks, Manchester	do.
Buildings, &c., Port Talbot, Wales	English Celluloid Company	F. B. Smith, Civil Engineer, Port Talbot	do.
Car Sheds, &c., Greenock, N.B.	Greenock, &c., Tramways	C. W. G. Little, Donington House, Norfolk-street, W.C.	do.
Villa, The Leas, Westcliff-on-Sea, Essex	Mr. E. Prater	Greenhalgh & Brockbank, Architects, Southend	do.
Stores Buildings, Lowther-street	York Equitable Indus. Soc. Ltd.	Athron & Beck, Architects, Doncaster	do.
*Extensions to County Asylum Buildings	Cornwall County Asylum	See Advertisement	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Engineer	Middlesex County Council	600*l.* per annum	July 10
*Clerk of Works	Enfield U.D.C.	3*l.* per week	July 18

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxiv. Public Appointments, pp. xxi. & xxiv.*

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following lists of tenders :—

BURGHLEY-ROAD SCHOOL (Highgate-road).—For new offices for junior girls :—

Marchant & Hirst	£275	T. Cruwys	£208
Killingback & Co.	231	Stevens Bros.*	186
Godson & Sons	225		

ESSEX-STREET SCHOOL (Stepney).—For carrying-out alterations to windows :—

A. E. Symes	£69 0 0	J. F. Holliday	£49 19 0
T. H. Jackson	65 8 6	J. T. Robey	47 12 0
F. & F. J. Wood	63 0 0	Johnson & Co.*	43 0 0

EAST-LANE SCHOOL (Bermondsey Wall).—For new house for schoolkeeper :—

Wall & Co.	£1,248	Rice & Son	£1,095
Maxwell Bros., Ltd.	1,192	Akers & Co.	1,055
Lathey Bros.	1,164	J. & C. Bowyer	1,013
F. & H. F. Higgs	1,152	T. D. Leng*	996
J. Appleby	1,133		

FAUNCE-STREET SCHOOL (Kennington Park-road).—For additional heating surface :—

W. G. Cannon	£108 0	G. & E. Bradley	£131 0
Brightside Foundry and Engineering Company, Ltd.	190 0	Duffield & Sons	121 0
Knight & Sons	190 0	J. Esson	118 10
J. C. Christie	155 0	Wenham & Waters, Ltd.*	118 0

FLINT-STREET SCHOOL (Walworth).—For sanitary and drainage works :—

G. Parker	£6,669 0 0	Ashby & Horner	£2,770 0 0
Martin, Wells, & Co.	4,042 0 0	Johnson & Co.	2,746 0 0
Falkner & Sons	3,209 0 0	J. & C. Bowyer	2,621 0 0
R. P. Beattie	2,968 15 6	Willmott & Sons*	2,550 0 0

HITHER GREEN SCHOOL (Lewisham).—For enlarging the manual centre and providing a room for science teaching, &c. :—

Johnson & Co.	£3,354 0 0
Holliday & Greenwood, Ltd.	2,910 0 9
F. & H. F. Higgs	2,906 0 0
W. Johnson & Co., Ltd.	2,886 0 0
Kirk & Randall	2,878 0 0
Garrett & Son	2,799 0 0
Smith & Sons, Ltd.	2,724 0 0
J. & C. Bowyer*	2,379 0 0

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"HUGH MYDDELTON" SCHOOL (Clerkenwell).—For sanitary works :—

J. Peattie	£225	Stevens Bros.*	£197
Bristow & Eatwell	210		

LANGFORD-ROAD SCHOOL (Fulham). — For additional heating surface :—

G. Davis	£410 0 0
Purcell & Nobbs	422 0 0
Defries & Sons, Limited	299 15 0
Bates & Sons	295 0 0
The Lighting Corporation, Limited	290 18 4
G. & E. Bradley	275 0 0
Brightside Foundry and Engineering Company, Limited	275 0 0
Seward & Co.	270 0 0
Knight & Sons*	270 0 0

PONTON-ROAD SCHOOL (Nine Elms).—For adapting portion of building for a day industrial school :—

First Competition.

Hooper & Son	£3,060	Garrett & Son	£2,869
W. Downs	2,983	Lathey Bros.	2,869
F. & H. F. Higgs	2,941	Rice & Son	2,845
J. Appleby	2,901		

As the amount of the lowest tender was in excess of the architect's estimate, the Committee decided that fresh tenders should be obtained. These tenders have now been received, the amounts of which are as follows :—

Second Competition.

Martin, Wells, & Co.	£3,485	Maxwell Bros., Ltd.	£2,785
General Builders, Ltd.	2,975	H. Line*	2,585

RUSHMORE-ROAD (Clapton).—For dividing two long rooms in boys' department :—

	A—Boys' Department (including half of total provisional sum, viz., £107 10s.)	B—Girls' Department (including half of total provisional sum, viz., £107 10s.)	
	£ s. d.	£ s. d.	£ s. d.
London School Furniture Company	566 0 0	680 0 0	1,246 0 0
Lawrance & Sons	565 0 0	550 0 0	1,115 0 0
W. Shurmur	550 0 0	545 0 0	1,095 0 0
G. Barker	500 0 0	556 0 0	1,056 0 0
Barrett & Power	414 0 0	568 10 0	982 10 0
Stevens Bros.	441 0 0	516 0 0	957 0 0
Willmott & Sons	420 0 0	500 0 0	920 0 0
Williams & Son	402 0 0	508 0 0	910 0 0
Bruce, Croom, & Co.*	355 15 2	451 16 6	807 11 8

SHILLINGTON-STREET SCHOOL (Battersea).—Partitions, &c. :—

	£	For supply of additional pitch pine blocks or for blocks omitted from quantity provided in specification at per yard super. s. d.
W. Hammond	790	—
Hooper & Son	789	—
F. & H. F. Higgs	759	6 9
Lathey Bros.	737	6 9
Marsland & Sons	730	4 0
E. B. Tucker	697	6 6
R. S. Ronald	684	—
E. Triggs	674	—
General Builders, Ltd.	657	4 6
R. H. Galbraith	653	—
Garrett & Son*	641	6 0

SURREY-LANE SCHOOL (Battersea).—For provision of a porch for infants' department :—

H. & G. Mallett	£305	Rice & Son	£289
R. S. Ronald	305	Maxwell Bros.	288
W. Hammond	293	E. B. Tucker	260
Williams & Son	293	Coleman & Co.*	233
Lathey Bros.	289		

SWAFFIELD-ROAD SCHOOL (Earlsfield).—For works on site :—

W. Hammond	£390 0	Lathey Bros.	£269 0
Williams & Sons	378 0	Maxwell Bros., Ltd.	265 0
R. S. Ronald	365 5	Garrett & Son*	253 0
E. Triggs	292 0		

WEBB-STREET SCHOOL (Bermondsey New-road).—For heating works :—

Comyn, Ching, & Co.	£154	W. Simmons	£109
W. G. Cannon	119	Stevens & Sons	100
Brightside Foundry & Engineering Co., Ltd.	118	Palowkar & Sons*	85

WESTON-STREET SCHOOL (Southwark).—For halls and other improvements :—

F. & H. F. Higgs	£4,923	Johnson & Co.	£4,370
J. Garrett & Son	4,795	E. Triggs	4,289
H. Wall & Co.	4,697	Stimpson & Co.	4,248
J. Marsland & Sons	4,490	General Builders, Ltd.*	3,958
J. Appleby	4,464		

For Repairs on Schedule (Groups 1, 2, and 3).

	Group 1.	Group 2.	Group 3.
H. Groves	+45%	+45%	+33⅓%
W. J. Howie	+35%	+35%	+35%
D. Gibb & Co.	+30%	+30%	+30%
† J. F. Holliday*	+25%	+25%	+25%

† This contractor states that for sanitary works (*i.e.*, repairs and alterations to sanitary work to be executed under the Board's Sanitary Surveyor) he will require an additional 12½ per cent.

Running contracts for the supply of various articles of ironmongery, &c.

—	Lavatory Cans.	Buckets.	Scuttles. (Japanned).	† Portable Coppers (14 gallons) for Laundry Centres.	‡ Screens for Iron Stoves.	Screw Hammers.	Squeegees. No. 1.	Squeegees. No. 2.	Squeegees. No. 3.
	per doz.	per doz.	each	each	each	per doz.	per doz.	per doz.	per doz.
	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pearson, Limited	1 2 6	1 1 9	6 2	—	—	—	3 19 0	3 13 0	3 7 0
O'Brien, Thomas, & Co.	1 15 0	1 5 6	7 9	3 0 0	13 0	2 8 0	—	—	—
Pryke & Palmer	1 16 5	1 0 6	5 5	2 4 5*	11 0	2 12 0	2 7 10	2 4 11	2 1 5
Braby & Co., Limited	—	1 4 6	—	2 9 6	9 6	—	—	—	—
Truman & Co.	3 12 0	1 12 0	7 0	—	—	—	—	—	—
Bird & Co.	1 3 6	0 17 9*	4 10	2 6 0	6 6*	1 18 0	1 19 0*	2 2 0*	2 7 0
Nettlefold & Sons	18 0*	0 18 0	4 6*	—	—	—	—	—	—
Davis, Limited	—	—	—	—	10 4	6 6 0	4 17 0	4 9 0	3 13 6
Pearson & Co.	—	—	—	—	—	1 14 6*	—	—	—

† A tender was also received for these articles at £2 5s. each, but the form was not signed.
‡ A tender was also received for these articles at 8s. 6d. each, but the form was not signed.

Estimates for executing repairs to furniture in various schools.

—	Edinburgh-road.	Blackheath-road.	Byron and Bright-street.	Lower Chapman-street.
G. M. Hammer & Co., Ltd.	£109 2 3	£198 12 6	£28 4 7	£87 9 6
H. Bouneau	72 11 6	185 13 2	20 0 0	87 8 6
T. Cruwys	57 14 9	170 14 9	28 10 0	74 8 0
General Builders, Ltd.	49 0 0	125 0 0	24 0 0	69 0 0
London School Furniture Company	45 9 3	113 7 3	18 17 6	65 13 0
Wake & Dean, Ltd.*	36 14 0	90 16 4	18 2 5	61 6 6

Running Contracts for the Supply of various Articles of Furniture, &c.

	Platforms for Pedestal Tables. Each. £ s. d.	Carpenters' Benches. Each. £ s. d.	Carpenters' Stools. Each. £ s. d.
Bruce, Croom, & Co.	1 4 0	*2 2 6	*0 5 9
London School Furnishing Co.	*0 19 6	2 6 0	0 7 6
W. H. Lascelles & Co.	1 12 0	3 1 0	0 8 9
G. M. Hammer & Co., Ltd.	1 2 6	2 15 0	0 8 0
T. Cruwys	1 11 0	2 5 6	0 9 0
H. Bouneau	1 10 0	2 5 6	0 8 0
[Unsigned]	1 10 0	—	—

	Chairs (Arm). Per 12. £ s. d.	Chairs (Small). Per 100. £ s. d.
T. Glenister	6 0 0	19 3 4
Waring & Sons	6 14 0	17 12 0
Cox & Son, Ltd.	5 17 0	15 0 0
T. Harding*	4 16 0	13 6 8

	Lesson Stand. Each. s. d.	Plate Racks. Each. s. d.	Meat Safes. Each. £ s. d.
Educational Supply Association, Ltd.	3 10	11 6	1 3 0
T. Cruwys	5 6	10 6	0 13 6
H. Bouneau	4 0	10 0	0 13 0
London School Furniture Co.	3 0	9 0	*0 12 6
Wake & Dean, Ltd.	*2 10	12 0	0 17 6
R. H. Galbraith	5 6	*7 9	0 13 9
Bennett Furnishing Co.	3 6	—	—

	Inkwell Cupboards. Each. £ s. d.	Tables. 3 ft. 6 in. by 2 ft. 6 in. Each. £ s. d.	Tables. (Kindergarten large. Each. £ s. d.
Lonnie & Co.	7 7 0	2 12 0	3 10 0
Educational Supply Association, Ltd.	5 12 0	2 11 9	2 7 3
Hammer & Co., Ltd.	4 0 0*	1 15 0	1 18 6
T. Cruwys	4 3 0	1 14 0	1 15 0
H. Bouneau	4 2 6	1 12 6*	1 13 6*
Spencer & Co	6 10 0	2 12 6	—

	Green baize curtains. (A quality.) per ft. super. s. d.	Green baize curtains. (B quality.) per ft. super. s. d.
Janes & Son	1 10	2 0
Mrs. H. Evans	0 7*	0 6*

For the supply of locks :—

	3-in. Brass Cut Cupboard Locks (2 lever). per doz. s. d.	3½-in. Brass Cut Cupboard Locks (2 lever). per doz. s. d.
Carter & Aynsley, Limited	8 0	12 6
S. Parkes & Co.	9 0	11 0
Lockerbie & Wilkinson, Ltd.	8 10	11 6
Pryke & Palmer*	7 10	9 10

Cleaning and Painting.

The work at the following schools will be executed during the summer holidays, July 25 to August 24, 1901. Where exterior as well as interior work has to be done, an additional week will be allowed for the former :—

ALVERTON-STREET.—Painting exterior and cleaning interior :—

T. D. Leng	£479 0	S. Musgrove	£340 2
Hayter & Son	395 0	W. J. Howie	340 5
H. Groves	355 0	W. Banks*	286 0

BAKER-STREET.—Cleaning interior and painting exterior :—

Beeson & Sons	£612 11	Gibb & Co.	£365 0
G. Barker	398 0	Corfield & Co.	360 0
Dolman & Co.	382 0	J. F. Holliday	358 0
J. T. Robey	367 0	Vigor & Co.*	309 10

BALTIC-STREET.—Painting interior :—

T. Cruwys	£350	Marchant & Hirst	£306
M. Pearson	333	W. Chappell	255
		G. Barker*	229

BELL-STREET.—Painting interior (old portion) and cleaning interior (new portion) :—

Beeson & Sons	£421 18	Marchant & Hirst	£296 0
Thompson & Beveridge	323 0	F. Chidley	246 0
T. Cruwys	311 0	Bristow & Eatwell*	231 10

BLACKSTOCK-ROAD.—Painting interior :—

C. & W. Hunnings	£561	Grover & Son	£496
McCormick & Sons	542	Stevens Bros.*	436
W. H. Stephens	525		

CAMPBELL-STREET.—Painting interior (old portion) :—

T. Cruwys	£400 0	W. Chappell	£105 0
Marchant & Hirst	245 0	F. Chidley	169 0
Bristow & Eatwell	209 5	Balfour & Co.*	152 3

CAPLAND-STREET.—Painting exterior and cleaning interior (junior and special school) :—

Wall & Co.	£295 0	Bristow & Eatwell	£221 11
Marchant & Hirst	287 0	F. Chidley*	206 15
W. Chappell	250 0		

CATOR-STREET.—Painting exterior :—

H. Line	£330	J. F. Ford	£263
Baylis & Francis	313	Rice & Son	228
Dearing & Son	275	Sayer & Son*	227

CREEK-ROAD.—Painting interior (old portion) and interior and exterior (j. m. school) :—

T. D. Leng	£679 0	W. J. Howie	£373 17
Johnson & Co.	498 0	E. Proctor	320 0
Hayter & Son	455 0	S. Musgrove*	315 16
H. Groves	389 0		

DIVISIONAL OFFICES AND SPECIAL SCHOOL, MORNING-LANE.—Painting interior :—

Barrett & Power	£118 0	McCormick & Sons	£97 0
G. Barker	113 0	L. Willmott*	72 10
Corfield & Co.	101 0		

EDGCOMBE-ROAD.—Painting interior and exterior (iron buildings) :—

W. V. Goad	£145	H. Line*	£90
Sayer & Son	120		

FARRANCE-STREET.—Painting exterior :—

Beeson & Sons	£351 18	J. T. Robey	£209 0
A. W. Derby	226 0	Gibb & Co.	207 0
Corfield & Co.	214 0	Johnson & Co.*	188 0

GLOBE-TERRACE.—Painting exterior :—

F. Bull	£162 0	Stevens Bros.	£139 0
J. Haydon	145 0	G. Barker*	136 10

HACKFORD-ROAD.—Painting interior (school and p.-t. school) :—

Sayer & Son	£871	Holliday & Greenwood, Ltd.	£563
H. & G. Mallett	684	Rice & Son	559
Holloway Bros.	673	E. Triggs*	506
Maxwell Bros., Ltd.	585		

HASELRIGGE-ROAD.—Painting interior :—

H. & G. Mallett	£613 0	Garrett & Son	£489 0
Holloway Bros.	600 0	W. Hornett	487 0
Holliday & Greenwood, Ltd.	558 10	Maxwell Bros., Ltd.	469 0
Rice & Son	520 0	E. Triggs*	449 0

HONEYWELL-ROAD.—Cleaning interior :—

Lorden & Son	£388	J. & M. Patrick	£277
E. Flood	350	W. Hornett	239
Rice & Son	301	Johnson & Co., Ltd.*	230

[*See also next page.*

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HORSEFERRY-ROAD.—Painting interior :—

T. L. Green.....	£529 0	Vigor & Co.....	£244 0
J. & M. Patrick ..	528 0	C. Gurling*	203 10
Lathey Bros.	289 0		

KENMONT-GARDENS.—Cleaning interior :—

T. Cruwys.....	£200 10	W. R. & A. Hide*	£139 0
F. Chidley	162 0	Bristow & Eatwell	125 0
W. Brown	156 0		

KENNINGTON - ROAD. — Painting interior and exterior :—

Martin, Wells, & Co.	£490	H. J. Williams	£383
J. F. Ford	465	E. Triggs*	360
G. Brittain	420	J. & M. Patrick.....	316
W. Hornett	403		

KILBURN-LANE.—Painting exterior :—

G. H. Sealey ..	£465 16 0	Bristow & Eatwell	£157 12 0
G. Neal	320 0 0	W. Brown	147 10 0
Balfour & Co..	256 14 6	F. T. Chinchen*	139 0 0
F. Chidley	196 0 0		
S. Polden.....	170 12 6		

LAMB-LANE.—Painting exterior (special school and correspondent's office) :—

Stevens Bros.	£108 0	Barrett & Power* ..	£76 0
G. Wales	88 5		

LAVENDER-HILL.—Painting exterior :—

Martin, Wells, & Co.	£420	Garrett & Son*	£286
Rice & Son	331		

MEDBURN-STREET.—Painting exterior and cleaning interior (junior girls' School) :—

Stevens Bros.	£330 0	Wall & Co.	£215 0
T. Cruwys	294 6	Marchant & Hirst*	199 0
Dearing & Son	239 0		

MINA-ROAD.—Painting interior and exterior :—

Johnson & Co.	£920	E. Triggs	£681
Sayer & Son	697	H. J. Williams*	611

MORDEN-TERRACE.—Painting interior :—

T. D. Leng.....	£694 0	E. Proctor	£366 0
W. Banks	416 0	H. Groves	341 0
W. J. Howie.....	389 14	Hayter & Son*	300 0

NEW PARK-ROAD. — Painting interior and exterior :—

Holliday & Greenwood, Ltd.	£467	Rice & Son	£401
		Garrett & Son.....	346
Sayer & Son	448	Star & Son	341
Lathey Bros.	407	Maxwell Bros., Ltd.*	338

OLD WOOLWICH-ROAD.—Painting interior :—

W. Banks.....	£269 19 6	H. Groves	£225 0 0
E. Proctor	255 0 0	Hayter & Son*	189 0 0

PRIORY-GROVE. — Painting interior and exterior (special school) :—

King & Son	£84	J. Garrett & Son*	£45
W. Downs	72		

QUEEN'S-ROAD.—Painting interior and exterior :—

Corfield & Co.....	£853	G. Barker	£575
Barrett & Power.....	825	T. Cruwys.....	549
W. Shurmur.....	610	C. Willmott*	491
Silk & Son	597		

ST. DUNSTAN'S-ROAD.—Painting interior :—

W. R. & A. Hide....	£466	C. Curd*	£360
W. Chappell	420	W. Brown.....	297
W. Hammond.....	399		

ST. JOHN'S, HALLEY-STREET.—Painting exterior :—

Dolman & Co.....	£203 0	Vigor & Co.	£189 0
J. T. Robey.....	200 0	G. Wales*	119 0
Hoard & Co.	190 10		

SHILLINGTON-STREET. — Painting interior and exterior (special school) :—

W. Hornett.....	£199	J. & M. Patrick*	£155
Rice & Son	177		

WEST LAMBETH DIVISIONAL OFFICES.—Painting interior :—

W. Hornett	£104 0	W. Downs	£69 0
Rice & Son	85 0	Maxwell Bros., Ltd.*	66 10
H. & G. Mallett ..	75 0		

WILLIAM-STREET.—Painting interior (infants' and p.t. schools) :—

W. R. & A. Hide	£210 15 0	W. Hammond..	£145 7 6
W. Chappell ..	205 0 0	F. Chidley*....	135 0 0
W. Brown	178 0 0		

WOODLAND-ROAD.—Painting interior :—

A. J. Acworth £326 0		G. Kemp	£295 0
Johnson & Co.	314 10	Lorden & Son	277 15
W. Johnson & Co., Ltd.	304 0	W. Hornett	259 0
		J. & C. Bowyer* ..	247 0

YORK-ROAD.—Painting exterior :—

Stevens Bros. ..	£139 0 0	Marchant & Hirst	£117 0 0
C. & W. Hunnings	125 12 6	W. Chappell ..	110 0 0
		G. Wales*	101 0 0

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The Builder.

VOL. LXXXI.—No. 3049. JUNE 13, 1901.

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Portland Cement Testing.

THE more one comes in contact with those who have to do with the using of cement, the more one is struck with the want of knowledge of the characteristics of it, and the points to be observed in so using it, that its good qualities are not killed or impaired in the using. It is not at all an uncommon thing to see a large heap of cement gauged, and, after using a portion of it, the remainder allowed to rest for periods amounting sometimes up to perhaps twenty-four hours; then being worked up again with more water and used in the work in a sort of blissful or innocent expectation that, although the cement has been killed, and therefore rendered nearly useless, it will somehow harden and do the work it has to do. This is, of course, as a rule done in ignorance. Such killed cement may, and probably does, harden to a certain extent in course of time, but if it has to carry what it has to carry in a very short time, a grave risk is run of its failing and probably entailing a large amount of damage and cost. Again, in talking to engineers, surveyors, &c., if the question is asked as to whether they test the cement they use, the answer is frequently given that it is not necessary, as they only buy an approved cement. This answer is of course given through ignorance of the amount of care and trouble that must be taken to ensure good quality, and that the failure or neglect on the part of any one of a considerable number of men may result in a cement of bad quality.

The quality of Portland cement depends on three or four conditions in the process of manufacture, as follows:—

First, the raw materials must be mixed in such a proportion that when the cement is finished it shall contain about 61 or 62 per cent. of lime; and although the arrangement as to proportions of the different raw materials may be in the hands of reliable and responsible men, the actual weighing, measurement, or mixing of them is nearly, if not quite, always in the hands of the ordinary day labourer. Should there be any fault in this mixing, what may be the result? Supposing that the mixing is irregular, the proportion of lime may vary 5 or 6 per cent., or even more, with the result that some of the cement may be over-limed to a dangerous extent, while some of the other may be under-limed to the same extent. The question then rises as to how this affects the work, and points to the necessity of the user testing all the cement he has to use. Instead of the irregularity mentioned, it may be that the cement is by accident or neglect regularly over-limed for a considerable time, and this over-limed cement reach the hands of the user. If it is not tested by him before using, but is put into its work either in concreting or plastering or the jointing of brickwork, the tendency that it has to swell and crack through its being over-limed must necessarily in all cases lead to trouble, cost, and probable danger, which could all have been prevented had the user tested the cement, as every user, whether of large or small quantities, should do. Through this want of testing one hears of such things as concrete swelling or rising up after a large amount of brickwork has been put on it, necessitating not only the concreting being done again, but the pulling down and rebuilding of all their brickwork. One hears of walls of buildings being pushed over by concrete floors swelling, which also could have been prevented had the cement been tested by the user. Probably this testing is often neglected through the user having the idea that in order to test the cement it is necessary to have an elaborate plant and fine laboratory, and that it needs an expensive tester to carry out such tests. This, however, is not so. With proper plant, which at the most need only cost say under 20*l.*, an office boy or labourer with ordinary common-sense can do all that is necessary, and the cost of the plant would naturally be saved if only one job was prevented from being spoilt by its use. If this cost is more than the user wishes to go to, it can be very considerably cut down by leaving out some of the testing plant and putting up with such testing apparatus not being so complete. This, of course, would not be so well, but could at any rate be complete enough to prevent such damages as mentioned above. There are also one or two simple tests that can be made practically without apparatus to prove the soundness of cement, viz., its not being over-limed. Cement mixed with water to about the consistency of treacle is poured into a bottle, such as a medicine bottle, and shaken until it overflows. This bottle is then placed on one side. If the cement is over-limed, or even if the proper grinding and amalgamation of the raw materials has not been made, the cement in the bottle will, after a length of time, varying according to how much that cement is over-limed or how badly ground and mixed, split the bottle. If, on the other hand, the cement is under-limed, the cement in the bottle will contract and become loose in it. This shrinkage is, of course, not so bad a fault as the expansion of it from over-liming, but for all that it is most undesirable, seeing that it is a sign of a weak cement and, as a rule, is of a bad colour. There is also another easy test for this, viz., as follows:—

Cement is mixed with water as before, but instead of placing it in a bottle it is put upon a shovel or piece of thin sheet iron, which in its turn is placed upon a fire, top of a boiler, or anywhere where the water can be quickly evaporated from it, care being taken not to have it hot enough to boil the water out. If the cement is a sound one it will remain solid and harden to a certain extent, but if over-limed or badly mixed, it will crack more or less, according to how bad it is. Another simple test is to gauge up a little cement to a very stiff paste, and put it, in the form of a pat, with its surface smoothed, upon some non-absorbent material

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such as glass or slate. This should be allowed to set or harden in the air, after which a very good idea may be obtained as to its soundness by dipping the finger in water and passing it quickly over the pat in such a way as to leave some water on it, or a little water may be dropped upon it. If the cement is overlimed the water will be sucked in instantly; if it is about right it will be sucked in more gradually, taking, say, from three to six seconds to be absorbed, and if underlimed will take a correspondingly longer time to be absorbed. This pat may then, in order to obtain a more definite proof as to its soundness, be placed in water, where, if overlimed, and in a time varying according to how much overlimed, the pat will crack, and if bad enough, fall to pieces. These are simple ways of testing the cement that, as we said before, may be carried out by anyone, and yet will, if used, prove the most important point as to whether the cement may be used in work. If the complete plant is obtained for testing cement in the ordinary way, the test for soundness is made at the same time as the test for tensile strain.

The testing of the tensile strain is looked upon generally as the most important test, of all. In order to make this test, cement is gauged with water to a stiff paste and placed in a mould, where it is allowed to set. It is then taken out, and twenty-four hours after being gauged is put into water, where it remains for six days more. If it has not expanded, cracked, or fretted, it is then placed in machines for the purpose, and pulled apart, this giving the strength it is capable of showing. The usual test for cement is that it must show a tensile strain of not less than 350 lbs. or 400 lbs. per square inch, the 1 in. square being now the usual section tested. There is another system sometimes used for making these moulds, which is known as the Arnold system. In this test the proper quantity of cement necessary for making the briquette is weighed, and is put into a mould of twice the depth of the briquette required. A die of one-half the depth of the mould is then placed upon the top of the cement in it, and is forced down by a powerful screw until it presses it to the 1 in. depth needed in the finished briquette. The mould altogether is then placed under water, and the cement takes up whatever water is necessary. The briquette is then taken out and treated in exactly the same way as the hand-gauged briquette. This test, although brought out much later than the hand-gauging, has not become very popular, although, looking at it generally, it obviates a number of faults that are found with the hand-gauging. For instance, different operators with hand-gauging make a very large amount of difference in the test a briquette will stand, as the hand-gauging is more or less thoroughly done. It also shows in one-third of the time any sign of cracking, and therefore the proof as to the cement being sound or unsound is much sooner arrived at. In addition to this test for soundness there is also another, which, however, has so far not become popular or common, probably because there are so many ways of carrying it out, and no agreement as to a standard arrangement of it. This arrangement consists of gauging the cement and putting it into water for a certain time, the temperature of this water being increased to anything between 160 deg. Fahr. and boiling point. Another arrangement is to place the cement sample, after gauging, in water at 110 deg. for twenty-four hours, when, if unsound, it will show signs of cracking; and still another is to put the pat or briquette in cold water, raise it gradually to boiling point, and keep it there for two or three hours.

The above deals fully with the checking of the mixing of the raw materials and thorough amalgamation of them, and also as to whether the proportions are correct; and, as mentioned earlier, as ordinary labourers have the control to a very large extent of this part, as well as the rest, of the process, it is of no use whatever relying upon the name of any firm as a guarantee that the work has been thoroughly done; and the need is again emphasised of all cement being tested by the user before it is put into the work, instead of trusting blindly to the fact of its having been supplied by a good maker as a proof that it is a sound cement.

The second point on which the quality of the cement depends is as to whether it is properly burnt—or, in other words, whether all the carbonic acid gas has been driven off and the resulting mixture brought to the state of semi-vitrification necessary.

This is rather a difficult matter to prove.

Until the present fineness in grinding was arrived at, the weight per bushel of the cement, the measure being filled in a particular way, was the accepted test; but, seeing that this weight per bushel varies, even with the same cement, to an enormous extent, by difference in grinding, it is of little use. That this difference exists may be understood when it is noted that, taking the ordinary cement as 100, impalpable flour of the same cement would weigh only about 60, and residue about 130. Provided the percentage of lime is not raised to a dangerous figure, the presence of a small amount of cement that is not thoroughly burnt does not do much harm; but if the percentage of lime is high, the cement will have a tendency to crack and swell through the presence of this under-burnt. The tests already given will, however, be to a certain extent a guide as to this burning being perfect enough.

The third and last condition as to the quality of the cement is that of the grinding, and this, although it does not affect the question of the soundness, has quite as great a bearing in the matter of the cement giving the strength and hardness for which it is calculated and placed in position.

There are a number of different grinding machines used by different cement makers, and each of these machines has its own effect in the reduction of the cement clinker to the marketable form. It is, however, generally admitted that practically the only part of the cement as bought that is of any value in the hardening and holding together in the work, is that part that has been reduced to such a size and form, viz., that of impalpable powder, as to be soluble or capable of being acted upon by the water. The part that is not so capable of being acted upon, which in the trade is usually known as "residue" from the fact that it is what is left upon the fine sieves when cement is tested on them, consists of small pieces of clinker, and as a proof that the residue is valueless and is not affected by water when in the form of residue it has been stated that briquettes made with neat cement and tested and stored away for months, have on being reground (such regrinding probably reducing some of the residue contained in the original cement, which was evidently unaltered in the original gauging to its flour or cementitious form), and without reburning, have stood, when gauged a second time, a very considerable tensile strain, approaching very closely to what the briquette originally stood. This agrees perfectly with the results as shown by the new method of testing cement for fineness, which proves that cement as sold on the market varies in proportion of flour or cementitious matter from 50 per cent. down to as low as 20 per cent. The residue, although inert, as long as it remains in the form of residue, or small clinker, is of very little more value than sand, and is not influenced or altered in any way by being brought in contact with water, or even if soaked in it, as shown above. If, however, this residue is ground down to impalpable flour it probably constitutes the best of the cement.

The old test for fineness was to put a certain quantity of cement through a certain sieve of known mesh, usually one of 2,500 holes per square inch or 5,800, and the usual percentage of residue left on these sieves was 2 or 3 and 5 to 8 per cent. respectively.

It has been perfectly understood that this testing of the size of residue as a proof of perfection of grinding did not meet the case, as, even with the finest sieve procurable, a very large proportion of the matter that went through with the flour was only residue, and practically of no more value than the larger residue that would not pass through the sieve, and hence this proportion left on the sieve was not a guide as to the proportion of cementitious matter or impalpable flour that it contained, and its consequent value.

There is also no doubt that although the tensile strain and soundness tests are of the most important in testing cement, the test for proportion of flour is also a very important one, especially seeing that it governs to a very large extent the tensile strain, and a low tensile strain may often be explained by the fact proved by the Flourometer test that the cement is deficient in flour, viz., has not been ground sufficiently well to reduce the necessary proportion to an active state, and is therefore no better than a cement that has been very heavily adulterated, this disadvantage being emphasised by the fact that the adulterant has been paid for at the full cement price instead of the few shillings per ton ordinary sand (which would be quite as valuable) would cost.

In one of the new systems of burning, about which a great deal has been said and a great deal prophesied, it is rumoured that the resulting clinker, which comes out in small nodules, and apparently in a very advantageous shape and size for grinding, is really so hard that it is almost impossible to get the proper proportion of flour, as the grinding efficiency of machines generally used for this is reduced by some 50 or 60 per cent., and even with that reduction in output of grinding plant the cement that is put into the warehouse from it is so deficient in flour that the tests are very much lower than they should be.

Without this fineness test it is, therefore, seen that the manufacturer may be blaming

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the proportion of lime contained in the cement as the reason for the low test, when it may be that this is perfectly correct, but that the fault is in imperfection of grinding. In the same way the user may put the cement down as being inherently weak cement when, after all, its failure is only due to the fact of the large proportion of residue contained in it, such residue being the same as a common adulterant. A cement that contains only 20 per cent. is naturally worth not nearly so much as a cement containing, as it should do, 40 per cent. or more, and it is suggested that all buyers should take particular care to see that this condition as to the proportion of flour should be taken into consideration with the price.

To sum up the whole of this article, what is intended to be advocated is that the old principle of trusting to a cement maker to send good cement is played out, and that although at times it may be necessary to send cement to some professional testers to confirm a test, as a rule it is absolutely necessary for any engineer who puts in work with cement, or any user who has to depend on the quality of the cement being right, to keep clear of damages and trouble, and, in fact, every one who is interested in the using or buying of cement, to test it more or less systematically for themselves before they use it; and it is hardly necessary to point out that there are a number of engineers and contractors who have had trouble and cost through cement not being so tested, the loss of money on one such job often having been large enough to pay the entire cost of such testing for a lifetime, even leaving out the fact that the engineer's or contractor's name must necessarily be damaged to a certain extent by his being associated with work that has failed or given trouble through the material not having been of good quality.

NOTES.

The Education Bill.

A GOOD deal of unreasonable outcry has been made about the temporary Education Bill which occupied the House of Commons on Monday and Tuesday last. It might have been more businesslike if the Government had been satisfied to pass a short Act leaving the School Boards to continue their higher work during the winter without reference to the Local Authorities. But School Boards, as every one knows, were created to manage elementary and not technical education, which has for some years been part of the business of Local Authorities. Nor can we think that School Boards, where they carry on higher or technical education, for the next few months are likely to have a real difficulty in making satisfactory arrangements with local authorities. The main point, which all interested in education now desire, is a good system of secondary and technical education, and that is a task which it is to be hoped the Government will take up next Session. We fear, however, that the present Parliament has no real interest in the subject.

The View from Richmond Hill.

SIR WHITTAKER ELLIS is doing a good work in trying to preserve the view from Richmond Hill, and to prevent what is known as the Marble Hill Estate from being built over. No effort should be spared to preserve these open spaces and fine views—they can never be replaced—and very often the way in which open spaces are being lost is scarcely appreciated. Not long since the estate in question could have been purchased for 70,000*l.*, and the London County Council had the question of a contribution under consideration. Meanwhile Sir Whittaker Ellis appealed for assistance towards the sum of 7,000*l.*, upon payment of which sum the owner was to keep the property off the market until further notice, but this undertaking seems now to be withdrawn. It would be a reasonable and patriotic thing for some rich man to purchase the whole estate and present it to the public, but English millionaires are less liberal than the American, who positively vie with one another in their efforts to spend money for public uses.

The Electrification of the Underground.

THE passing of the preamble of the Metropolitan District Railway Bill by a Parliamentary Committee brings us within measurable distance of electric traction on the Underground. It was stated by counsel that the District Company were losing 800*l.* a week and the Metropolitan 1,000*l.* a week by the competition of the Central London Railway. It is not to be wondered at, therefore, that they have at last recognised the necessity of adopting electricity as their motive power. Unfortunately each of the companies favours a different system. Whilst the District Railway wants to adopt the Ganz method of utilising high pressure three-phase alternating currents, the Metropolitan Company desire the ordinary third rail 500-volt system. One of the reasons apparently why the latter company wish to adopt the lower pressure is that they believe that the Board of Trade is not prepared to sanction the Ganz system until it has been experimentally tried on the Metropolitan Railway, and this cannot be done in the time at their disposal. We are glad that a proviso has been inserted in the Bill that in the event of the two companies failing to come to an agreement within one month, then the Board of Trade is to appoint a special tribunal to decide the question. Major Cardew, who was at one time electrical adviser to the Board of Trade, has made a careful inspection of the experimental line at Buda-Pesth constructed by the Ganz Company, and has reported most favourably on it. This system is to be used on a full-gauge railway 110 miles long in the North of Italy, most of which has now been constructed. The current is generated at 20,000 volts and is conveyed at this pressure to the power stations along the line, which are ten miles apart. It is then transformed to 3,000 volts at which pressure the two trolley wires are charged. The current is collected from the wires by two sliding shoes which are pressed against them by the trolley pole, and the three-phase motors on the locomotives work directly at this high pressure. The first cost is small and the efficiency of the whole arrangement is very high. The motors will work both in series and parallel equally economically, and hence the trains can run economically at all speeds. Also if they require to stop suddenly, energy can be restored to the line. If electricians can manage to cage in the high pressure so as to make it almost absolutely safe, then the Ganz system would be an admirable one.

Curious Effect of Lightning.

A LETTER by "L. H." in Wednesday's *Times* describes the somewhat disastrous effects produced by a lightning discharge in earthenware sewer and drain-pipes during a thunder-storm at Camberley on June 29. Some of the discharge got access to the sewer by an ordinary wrought-iron ventilating column surmounted on the top by the usual galvanised wire balloon. The drain-pipes from a neighbouring man-hole to the ventilating shaft were blown to fragments and several yards of the sewer and of two pipes draining into it were destroyed. The walls of the man-hole which was 3 ft. deep were completely shattered and it had to be rebuilt. "L. H." raises the question of whether ventilating shafts are a source of danger. That they are a possible source of danger this accident proves, and it may be worth while taking precautions against lightning in special cases. The path of least resistance of the discharge to earth was down the iron ventilating shaft into the sewer, and then along the water in all directions, apparently even branching off into drain pipes. The discharge obviously decomposed some of the water, and the gas caused an explosion, either by its sudden generation or by its ignition, or probably by both. We have noticed in a thunderstorm at sea that where the lightning struck the sea a narrow column of water or steam several feet high seemed to rise, not unlike the splash made by a gannet when diving. As the discharge in this case could distribute itself throughout the immense volume of a good conducting liquid, and yet on impact caused some kind of explosion, it will be obvious that when confined in narrow drains it could easily do great damage. The accident at Camberley would probably not have happened if the thunderstorm had not been preceded by a long spell of dry weather, making the earth round the pipe a very poor conductor. If the ventilating column had made good contact with earth, or if it had been connected by a wire rope to a water-main, this would not have occurred. It might even be advisable in very special cases to use an earth plate like a lightning-conductor. If galvanised iron were used the cost would be very small.

St. John's (Parish) Church, Hackney.

THE repair of the fabric of this church is about to be undertaken, the eight bells and the belfry will be put in order, and electric light is to be installed. The erection of the church was begun on the north-east side of the earlier and later graveyards, from Spiller's designs, in May, 1792. Soon after its consecration on July 13, 1797, the old church, originally dedicated to St. Augustine, of which the nave and chancel had been rebuilt in 1517 by Sir John Heron and the Rector, Christopher Urswick, was pulled down—with the exception of the fourteenth-century tower and Sir Henry Rowe's Chapel (1614). The present church is remarkable for its square plan, having a projecting face, 21 ft. in depth, to each elevation, as well as for the large area at the cross, 63 ft. square. A pediment surmounts the projecting face on each elevation; the windows and doors are set in arched recesses; around three sides of the interior, which measures 105 ft. each way, is a gallery carried by Doric columns. In 1812-3 were added the steeple and five entrance porticos.

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Messrs. Dowdeswell's Gallery.

MESSRS. DOWDESWELL have at their Gallery in New Bond-street a collection of "Pictures by Old Masters" the property of a Parisian gentleman who is, we presume, disposing of them. They represent rather out-of-the-way "Old Masters," and the majority of them are more curious than beautiful. There is however an undoubted Rubens, one of those monochrome studies with the general style of one is familiar; this one is a Bacchanalian subject; and there is a half-length portrait by Goya, of his son; also a full-length portrait of an Alcalde of Madrid attributed to Goya, but which, though a good picture, is more hard in texture and less free and broad in style than is usual with that painter. A hard but brilliant flower-piece by Adriaenssen is of some interest, as also two large paintings by Guardi, "The Marriage of the Adriatic" and "The Return from the Festival," in the latter of which are some bits of architecture in Guardi's best manner. A far more interesting collection, however, is that in the front room, of the water-colour paintings by Miss E. Fortescue-Brickdale, exhibited under the collective title, "Such stuff as dreams are made of." These are somewhat mystical paintings and contain, for works of art, too much of what is sometimes called the "literary element"—pictures with a moral which requires in most cases the explanation of the catalogue, and as a mere matter of design few of them can be called beautiful; but they have another element of beauty, that of colour, in a very high degree, and in many of them there is a great deal of intellectual interest and power in the manner in which a satire or a moral is conveyed. Among these may be mentioned especially "Riches" (15), a poor man and woman with their infant—a fine composition too; "Yesterday" (7) a figure who takes off a comic mask and looks back with a solemn expression—this also is one of the best in a pictorial sense, and is a very striking composition; "I have married a wife and therefore I cannot come" (9); "With the bean-flower's boon" (16), a study of a girl seated under trees amid flickers of sunlight; "If I say, peradventure the darkness shall cover me" (27), a cloaked ruffian crossing a bridge by night with a dagger, and startled by the supernatural light emanating from a crucifix; "The Friend" (29); "The Reward" (39), and "Thou fool, this night thy soul shall be required of thee" (44). These latter three, besides their power of execution, are very keen satires on life, the text to No. 44 being given a quite new and startling signification, a puzzle evidently to some of the visitors; we will not give the explanation; it ought to be obvious. We regret that owing to accident we neglected earlier to notice this rather remarkable exhibition, which closes to-day (Saturday); those of our readers who see this in time may be recommended not to omit a visit to the collection before it closes.

"GILLOW'S," OXFORD-STREET.—Some extensive alterations of their premises have been carried out by the representatives of this old established firm, including the incorporation into one of the two houses in Oxford-street which, together with the factories, were built from the plans and designs of Thomas Little (1802-59). The firm was established more than one hundred years ago as decorators and house furnishers, and, we believe, possess the original drawings by the Brothers Adam, Hepplewhite, Sheraton, Chippendale, and others whose designs they have used during that period.

LETTER FROM PARIS.*

THE general meeting of the thirteenth Congrès des Architectes Français was held on June 29 in the hemicycle of the École des Beaux-Arts at Paris, and the Société Centrale des Architectes Français distributed the various awards which each year are devoted to architects and others connected with architecture, art, and construction. The Ministers of Commerce and Public Instruction and Fine Arts were duly represented.

MM. Boileau and Poupinel read the Annual Report and distributed the awards, of which the following are a few:—The Gold Medal of Honour was awarded to M. J. Martenot, architect, of Rennes; the Silver Medal for Domestic Architecture was awarded to MM. E. Bruneau, architect (of Paris); J. Hermant, architect (Paris); and Mellet Frères, architects (Rennes). The Medal for Archæology was handed to M. E. Pontremoli, architect (Paris); that for Jurisprudence to M. A. Goualt, architect (Paris); the Medal for the École de France at Athens was awarded to M. Mendel, student of the École at Athens. M. Chaussepied, of Quimper, carried off the Medal for Studies of French Monuments: M. G. Lefort, pupil of MM. Guadet and Paulin, took the Medal of the École des Beaux-Arts, and MM. Wielhorski and Faure the medal given to students of the private schools of architecture. Medals were awarded to several employees of architects and the building trade, to pupils of the various schools of industry and art, and a large number of silver medals to various workmen and others who have called for special remark in their work on various buildings. A brilliant banquet, presided over by M. C. Moyaux, President of the Société, and assisted by the representatives of the Ministers of Commerce and Fine Arts, took place in the evening at the Hotel Continental.

The competition called "Concours des Façades" is now open amongst architects and owners of houses erected at Paris in 1900. The owners of the six premiated houses will be exempt from half the street dues pertaining to these houses, a gold medal will be awarded to each of the architects, and a bronze medal to each of the builders. The jury will be composed of five members of the Municipal Council, M. Bouvard, the director of the Service of Architecture, the city architect, and two architects to be chosen by the competitors.

The various works sent from Italy by the Prix de Rome students of the École des Beaux-Arts were exhibited at the École until July 6. M. Chafflot, a student of the second year, sends in some very complete and remarkably well-drawn studies: a fragment of the façade and the interior decoration of the Villa Medicis, a Mosque at Kairoun, the interior decoration of the villa of Pope Julius II. at Rome, and the actual state of the Trajan column at Rome. M. Garnier (second year) exhibits drawings of the actual state of the Roman Forum and a scheme for an industrial agglomeration. M. Duquesne (third year) sends an interesting set of drawings of the Thermee of Caracalla. Among the sculpture exhibits were some works of a high order and of considerable individuality. The bas-relief by M. Vermare, entitled "Le Rhône et la Saône," deserves praise, since its author has kept himself free from commonplace and conventionality. The group by M. Champeil entitled "Printemps de la Vie" is a graceful and well-executed piece of sculpture. We may mention also the "Temps Consolateur" by M. Grégoire. Among the paintings the most remarkable is certainly the "Poème d'Amour," being the legend of Orpheus and Eurydice, by M. Moulin, who has under this title exhibited a series of fourteen subjects arranged on either face of a large drawing-room screen. The forms are good, the conception poetic, and the author, without losing sight of the great traditions of the art, has endeavoured to show by his arrangement that the official instruction of the Ecole des Beaux Arts may very well lend itself to applied art of a decorative or industrial character. Generally speaking the collection, notwithstanding some weaknesses pardonable in young artists, is very satisfactory.

We must mention, however, that one of the sets of drawings sent in by M. Tony Garnier, and entitled by him "Cité Industrielle," a rather clever design for a group of industrial buildings, with studios, workshops, offices, and small buildings for housing the workmen, since the opening day of the exhibition disappeared from amongst the other drawings exhibited on the walls of the Salle Melpomene, This withdrawal was made by the orders of the Académie des Beaux Arts, which looks with a very unfavourable eye on any attempts of the students to contribute any designs having a modern tendency as regards programme and construction. In fact the rules of the Académie allow the acceptation of works of archæological interest only, such as measured drawings of old buildings or restorations of ancient or Renaissance monuments. Last year M. Duquesne, having sent in from Italy a design for a "Maison du Peuple," was severely reprimanded, and therefore did not contribute this year the remainder of his studies for his design above mentioned. The matter has stirred up considerable party feeling at the Ecole, and a large number of the students strongly criticise the action of the Academie.

The Commission appointed by the Minister of Public Instruction and Fine Arts for the purpose of studying the question proposed by M. Stanislas Ferrand, M.P., concerning the creation of district schools for the study of architecture, has decided on the necessity for such schools, and the principle of their creation in the larger towns of France has been voted unanimously.

The Congress of the Société Française d'Archeologie has just taken place at Agen under the presidency of M. Lefèvre Pontallis. MM. Lucas, A. Besnard, and Guitard were sent as the delegates from the Société Centrale des Architectes. Interesting excursions were made to various parts of the district.

As a result of the campaign which has been made by certain syndicates against the employment of white-lead in the composition of painting materials, the Minister of Public Works has issued a circular to architects and engineers connected with his department instructing them to henceforth forbid the use of white-lead in all public painting work, and prescribing the employment of zinc-white in its stead. The Société Centrale des Architectes has, however, as far as it is concerned, informed architects and engineers generally that the question of the employment of zinc-white in the place of white-lead is entirely left to their discretion, at the same time pointing out that, owing to certain dangers to workmen employing lead colours, it would be well to favour the use of zinc-white in every case where there is no obstacle to its employment.

The decoration of the Grand Palais des Champs Elysées will shortly be completed by the addition of two quadrigas of hammered copper, the work of M. Recipon, sculptor. M. Déglane, the architect of the Palais, has erected at the southern extremity of the building an immense scaffolding, by the aid of which the weighty pieces of the first of these groups will be raised to the roof. The mounting of the two groups, "Fame passing Time," and "Apollo as the God of Arts and Harmony, vanquisher of Discord," cubing over 200 ft. each, will take about three months, each piece having to be raised and put together separately.

The competition for the interior decoration of the Mairie of Asnières has resulted in the prize of 600*l.* being carried off by M. Bouvet, who is also entrusted with the execution of the work. Mentions were awarded to MM. Darrien and Schmitt.

The State has purchased the work exhibited by M. Chauvet in the section of Architecture at the Salon des Artistes Français, a series of measured drawings of the frescoes decorating the old Manor of Chaillant.

M. Pascal, the architect of the new portion of the Bibliothèque Nationale, intends placing the magnificent clock, which has been designed by the well-known sculptor, M. Barrias, on the portion of the building forming the angle of the Rues Colbert and Vivienne. The model from which the sculptors will work is quite ready and will be executed at once. The design has been already described in the *Builder*.

The sentence in the case of the responsibilities for the accident to the footbridge leading to the Globe Celeste at the late Exhibition, has been rendered as follows:—M. Galeron, architect, grantee of the Globe Celeste and general contractor for the footbridge; M. Tedesco, consulting engineer to the Globe

* Unavoidably postponed from last week.

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Celeste; M. Mattrai, manager of the Société du Béton Armé, were all declared responsible for the fall of the construction, and were condemned, for homicide and injuries by imprudence, to two months' imprisonment with reprieve and 24*l.* fine each. The Société du Béton Armé was declared civilly responsible. The judges, when rendering the sentence, added that no aspersion was thrown on the perfectly honourable character of the three gentlemen. Appeal has been made from the sentence.

The Société des Beaux-Arts, under the presidency of M. Carolus Duran, has elected in the section of architecture MM. Louis Bigot, Jean Besnard, Gerard, and Sorel as Associates, and MM. Théodore Lambert, Sauvage, and Piérre Selmersheim as members.

The bust of the celebrated architect, Robert de Cotte, has just been placed in the large vestibule of the Bibliothèque Nationale. The bust, of white marble, is the work of the sculptor, Eugène Sollier. Robert de Cotte was official architect in 1708 to 1735. He undertook nearly all the important work of the time, and under the Regency prepared the transformation of the old Hôtel de Névers into the Bibliothèque du Roi. The fine building opposite the large courtyard of the Bibliothèque Nationale and the beautifully decorated small library on the first floor, as well as the large vaulted gallery devoted to engravings, are specimens of some of the best work of this architect.

The two Salons have closed their doors, and the architects of the Grand Palais are now at liberty to complete the final work on their monument. It is the same with the Petit Palais, where the "Exposition de l'Enfance" is also finished, and M. Girault will now be at liberty to carry out the installation of lighting, warming, and interior arrangements generally. The Municipal Council, before this session is over, is to give its long expected decision in regard to the future use of this fine Palace, so appropriate to the purposes of an artistic museum. The Council intend to purchase the fine group in gilt bronze, by Frémiet, of St. George and the Dragon, and to place it in the centre of the principal gallery, which is to be decorated with allegorical paintings and tapestries, and to receive the collection of sculpture belonging to the city. If the Council agrees before separating to use the building as the Art Museum of the City of Paris, the inauguration of the Museum may take place by the end of next year.* The Champs Elysées is now restored to its normal condition; and the Cours la Reine, which was so laid waste by the great exhibition, is now getting put in order again, the flower-beds laid out anew, and the trees replaced. The Administration will take advantage of the occasion to form a large aquarium in the gardens of the Trocadero.

The Municipal Council will also have to decide shortly on the position of the monument which a public subscription Committee wishes to raise to the memory of Pasteur. This monument, entirely of marble, was left unfinished by Falguière. M. Victor Peter has completed it, under the direction of M. Paul Dubois. The seated figure of Pasteur is placed on a pedestal, decorated with various allegorical groups of fine character, though of great simplicity of design. It is probable that this monument to the illustrious savant will, according to the wish of the committee, be placed at the intersection of the Boulevard de St. Michael and the Rue Medicis, on the axis of the Rue Soufflot; that is to say, in the very centre of the scholastic quarter, near to the Sorbonne and to the scientific establishments where Pasteur taught, and opposite to the Panthéon, where his remains would have been laid had he not formally expressed a wish to repose in the institute which he founded in Rue Dutot, and where M. Girault has built a fine crypt decorated by M. Olivier Merson.

The Municipal Council is in some difficulty about the monument to Alphonse Daudet, which it has been proposed to erect in the Champs Elysées. The Parc Monceau, which had been thought of, is already full of commemorative monuments, which are half hidden by the shrubbery. But the Champs Elysées, already encumbered by pavilions, cafés, and establishments of all kinds, does not lend itself well to monuments of the illustrious dead placed between two music halls. Besides, it would be regarded as a precedent which would give a new impulse to the prevalent "statuemania." The proper site for a monument to Daudet is obviously the garden of the Luxembourg, along with Leconte de Lisle, Murger, Théodore de Banville, and other authors whose monuments have made this site a veritable poets' corner.

We have to record the death, at the age of eighty-seven, of the painter Alexandre Lafond, one of the few survivors of the school of artists formed by Ingres. This venerable artist, who was an excellent portrait painter, had exhibited at the Salon for more than sixty years, and had been "hors concours" since 1863. He had taken part along with Lehmann in the decoration of the old Hôtel de Ville.

* Since the above was written, we are glad to learn that it has been finally decided that the Petit Palais is to become the Fine-Art Museum of the Paris Municipality. The building could not be put to a better or more suitable use.

MAGAZINES AND REVIEWS.

THE *Art Journal* devotes an article to an Italian artist, Signor Luigi Nono, to whom a special room was devoted in an exhibition at Venice. From the illustrations he appears to be a charming painter of modern rural life, as far as character and design are concerned; of colour one can of course form no estimate from the engravings; colour is often not the happiest element in modern Italian art. The artist has, it is said, a habit of signing his work "Luigi IX.," a play on his name "Nono," which the writer of the article thinks has militated against his name becoming known. A short article is devoted to the clever French painter M. J. Jacques Rousseau (not to be confounded with Théodore Rousseau, the landscape painter), and Mr. Claude Phillips has an article on "The Spanish pictures in the Wallace Collection," which is of importance to those who wish to study the collection from a critical point of view. Important also is Mr. Heywood Sumner's illustrated article on "A Forgotten Craft," that of flat incised wood-carving with the incisions filled in with a stopping; in Mr. Sumner's case a melted wax and other materials. He gives illustrations from a cypress-wood chest in the South Kensington Museum, and one or two illustrations of works of his own produced with the intent to revive this lost form of work, of which the *modus operandi* is fully described.

In the *Magazine of Art* the series on "Artists' Studios, as They Were and as They Are," becomes very interesting. In some of the interiors illustrated we seem to read over again the tendencies of the artist's work and the favourite effects of his pictures. This is especially the case with Benjamin-Constant and Gerôme; the former's studio, but for the figures, looks like one of his own pictures of Oriental subjects. The author (Mr. W. Goodman) remarks at the close of the article that the studio, in more ways than one, very much assists in the making of a picture, and that had Millet, who was often obliged to paint in the open air "not from choice," possessed in his early days a fairly-appointed studio, it might have made all the difference in his success, in one sense at least of the word.

The *Artist* contains an article with a good many illustrations of the charcoal drawings of Mr. Frank Wasley, an artist unknown to us before, and which are well worth illustration and attention. Mr. Wasley seems, to judge from these reproductions, to have got the true perception of what can be done best with charcoal. His "Shipping at Sunset" and "Shipping in a Calm" are admirable sketches. The "Scheme for Decoration of a Room" by Mr. A. H. Baxter, is a repetition of forms and effects which have become an æsthetic fashion, but which owe a good deal of their effect to mere novelty. When, or if, they come more generally into use, they will cease to be admired so much. There is interest and piquancy in this school of interior decorative treatment, but it wants elevation of style and refinement of line, and has not the elements of permanency. In the same number the remark, in an article on "The Paris Salons," that in the sculpture at the Salons "all interest centres on Rodin's Victor Hugo," that half figure roughhewed out of part of a block, is an instance of the curious perversity and lunacy which has come over critics (or those who act as such) in regard to the work of this eccentric and wayward man of genius. To talk about all interest centering on this piece of bravado, when there was such a work as Boucher's "Ancient et Moderne" not many yards from it in the adjoining salon, is sheer perversity.

The *Studio* (June 15) contains an article on "Recent Etching and Engraving," by Mr. Wedmore, whose ideas on art are always worth attention, and who illustrates his subject by two remarkable city studies—"Siena," by Mr. D. Y. Cameron, and "Montmartre," by M. Béjot. An illustrated article on "Recent Examples of the Jeweller's Art in France" is of interest for the illustrations. Mr. W. Shaw Sparrow contributes what comes too near to being what might be called a "puff" of Miss Fortescue-Brickdale and her paintings, mentioned in a Note on another page of this issue. This kind of personal exploitation of new artists is in very bad taste, and does not conduce to well-balanced or thoughtful criticism. Miss Fortescue-Brickdale is a very clever and original artist, but not all that is said about her here, and this sort of trumpeting does we believe no real service to an artist.

The *Berlin Architektur-Welt* gives several examples of recent street architecture, including part of the façades of two houses in the Bamberger-strasse, illustrating the new method in which an almost entire absence of moulding is supplied by flat surface ornament produced apparently in cement or *sgraffito*, round or between the windows. It is a poor and trumpery kind of treatment of street architecture. The Berlin Mörtelwerke at Charlottenburg, by Herr Pernet, is a fair specimen of warehouse architecture.

In view of the recent terrible colliery catastrophe, the article on "Colliery Management" in the *Engineering Magazine* seems to come at the right time. The article is by Mr. W. Blakemore. He cannot suggest that there is at present any satisfactory method of dealing with the danger from coal-dust, but attempts to damp the dust have met with some degree of success. In regard to the power to be used in working a mine he sums up as follows:—

> "The transmission of power for all purposes below ground is an important matter and one which at the moment is showing the most interesting development. The manager has a choice of wire ropes, steam, compressed air, and electricity as a motive power. All have their votaries, and under special conditions each one possesses some advantage. To generalise, it may be said that wire-rope transmission is cheaper than any other up to one mile; after that electricity takes the lead. Within that radius compressed air is capable of doing very good work, being safe, easy to apply, and helpful to the ventilation. On the other hand, it is at least 20 to 25 per cent. dearer to instal than electricity, the greatest feature of the latter being the facility with which it can be adapted to various uses, its high efficiency, and its greater safety in the absence of gas. Bulkiness of pipe connexions is a constant source of danger and inconvenience which does not exist in the case of cables. On the other hand, the use of electricity is limited, and in fact determined, by the element of danger which pertains to it; and to overcome this is the task of the electrical engineer of the future. It is being used where there is no gas, but there is a growing indisposition to take the cables into the working face whenever gas has been seen. At present its greatest use is for hauling and pumping, as these operations can be carried on as a rule sufficiently far from the working faces, where the greatest danger exists."

In *Feilden's Magazine* Mr. F. Hope-Jones writes an article on the fascinating and yet highly practical subject of electrically driven clocks, *i.e.*, clock faces with little more behind them but a single wheel, a lever, and an electro-magnet, "the whole constituting an electrical step-by-step movement which revolves the hands half a minute at a time in response to impulses sent out from the one controlling pendulum." The advantage in economy of cost and labour in having to make only one highly finished piece of clock-work to drive a number of dials in different places—with the further advantage that they all keep precisely the same time, which no two clocks can be got to do, at all events for long—is of course too obvious for any need of argument. Mr. Hope-Jones shows that there have been difficulties in regard to the method of contact employed. "A stud and a spring are commonly used, one member being permanently fixed while the other is brought against it. The duration of this contact has always been arbitrarily decided by guesswork, and is sometimes so short that the more sluggish of the dials will not respond to it. More often the contact is many times longer than is necessary, and as 1,051,200 of them are required in every year the waste of energy is considerable." In Mr. Hope-Jones's central clock, which has no dial and hands but is only a driving power for the dials subordinate to

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is an automatic electrical switch governed by a pendulum:—

"In this switch the duration of the contact is dependent upon an electro-magnet placed in series with all the magnets it has to control, and its length is therefore governed by the time constant of the entire circuit; so that at the exact moment when each dial magnet has developed sufficient electro-magnetic energy to do the work required of it, the supply of current is instantly cut off. Thus if electric-light supply is used to operate a time circuit (through an incandescent lamp as working resistance) the switch automatically proportions its supply to the requirements of the circuit by breaking contact at the moment when the lamp filament has become warmed up sufficiently to reduce its resistance and allow the necessary current to pass. And in circuits operated by primary batteries the duration of the contact will, within reasonable limits, adjust itself to the condition of the cells. If the voltage is high and the internal resistance low, the dials will work safely with a short impulse, and will receive it. When the cells are getting old the duration will increase."

It is to be hoped that it will not be long before London has a time-system municipally controlled from a centre, instead of our finding clocks telling a slightly different time in every street.

The *Pall Mall Magazine* contains an article by Professor James Geikie on the question, "How Long Will Our Coal Last?" The first part of it might interest a schoolboy so far as it imparts any science, though there is certainly a little elementary political economy thrown in. It is stated that "Every one knows that the value of an estimate depends on the accuracy of the data employed"—yet farther on we find the astounding statement that "The extent and structure of those (coal) basins are now well known, and the number of workable coal seams has long been ascertained." If the latter statement could only be borne out by the facts, we agree it would not be difficult to answer the question at the head of the article. Our mind travels over large tracts of ground to the east of the Somerset coalfield, and to several other localities in England where the nature and extent of the coal-seams have not been proved at all. However, we will give that in, as we find later on in the article the author himself contradicts his former statement. 'Many still feel, that in all such calculations (*i.e.*, the duration of our coal supply) there are many elements of uncertainty, and that in the very nature of things a definite answer . . . is impossible." Again, "It is still a moot question whether any concealed coal-bearing strata occur within the wide regions occupied by the Cretaceous and Tertiary deposits of eastern England." We quite agree with Professor Geikie that mining operations in our coalfields need not be limited to a depth of 4,000 ft.—the limit usually assigned—as we have experience in that direction in other countries. The author arrives at the conclusion that even if our supplies are as great as the Coal Commission (1871) supposed, they cannot at an increasing rate of consumption last for more than two or three hundred years. The same issue contains an article on "Glasgow—the Second City," which is rather *couleur de rose*—Glasgow is a great and enterprising city, but hardly a beautiful one; and another on "Stowe" as one of the "stately homes of England." The article is accompanied by various illustrations of this fine house and its surroundings, but the writing is entirely of the popular family history order; there is not only no art criticism, but not even a statement of the names of the eminent architects—Vanbrugh, Kent, and others, who were variously concerned in the works from time to time.

Harper contains an article on "Municipal Art in Paris," by Mr. C. M. Robinson; an article which we recommend to the attention of our London County Council men and other persons interested (or who ought to be interested) in the amenities of the capital city. It will show how it is that Paris ranks as a beautiful city in a sense in which London does not—that it is not only clearer air and a plentiful supply of beautiful building stone that work the magic, but the determination of the conscript fathers that it shall be a beautiful city, as far as they can make it so, and that no care and pains, and we may almost say no expense, shall be spared to that end.

Scribner contains a long and most interesting article by Mr. Rufus B. Richardson, the Director of the American School at Athens, on "A Tour in Sicily." He takes the reader to Girgenti and Segesta and Selinonte and Taormina, with many illustrations from photographs, and the fresh impressions of an archæological scholar on visiting these sites, as we gather, for the first time. Two of the photographs give a vivid impression of the utter ruin of the temples C and G at Selinonte—nothing but heaps of drums of columns tumbled together in inextricable confusion.

The *Century* contains a short article by Mr. F. Keppel on "A Notable Masterpiece by Millet" (inadvertently given as "Millett" in the index), which is really written to accompany a frontispiece illustration of "The Woodsawyers." He mentions that Mr. Ionides had both this picture and the "Angelus" offered to him simultaneously, the former for 500*l.*, the latter for 800*l.*, and that on the advice of Mr. Legros he purchased the "Sawyers," the Slade Professor assuring him that it was the greater picture of the two. Considering the tendency of Mr. Legros' own art, we can quite understand his thinking so, but we are not quite sure that he was right. Mr. Cole, for the series of "Engravings of Old English Masters" gives us one from Constable's "Hampstead Heath," a kind of work, however, which can hardly be done justice to by line engraving on a small scale, though the engraver's style is as good as ever.

The *Idler* contains an article by Mr. F. W. Skinner on "Bridge-building," which, in a popular manner, gives a very good account, with some illustrations, of the great problems of modern bridge-building. In speaking of the especially novel character of bridge-building in the present day, however, it should not be forgotten that although the application of cantilever constructions on a great scale is new, the cantilever principle itself is one of the oldest in its application to bridges.

In the *Gentleman's Magazine* Mr. Arthur Ransom has a short article on "The Anticipated Scarcity of Timber." We do not know that it is "anticipated," but it is certainly, as he argues, a not very remote possibility unless more systematic means are taken to promote and ensure the growth of new plantations on an extensive scale. As Mr. Ransom points out, it is not only a question of want of timber for constructions, but of the effect on the earth's climate which the removal of trees would have.

The *Home Counties Magazine* contains an interesting article on "London Windmills," the former sites of some of which are still commemorated by such names as "Windmill-street," &c.

We have received *Knowledge*, the *Révue Générale*, and the *Quarterly Bulletin* of the American Institute of Architects.

ROYAL ARCHÆOLOGICAL INSTITUTE.

AT the general meeting on the 3rd inst., Mr. Emanuel Green, Hon. Director, in the chair, Mr. F. G. Hilton Price communicated a paper on "Clay Tobacco Pipes of the Seventeenth Century," found at Bristol during recent excavations, and exhibited specimens presented to him by Mr. John E. Pritchard, F.S.A. The pipes bear upon the heel either the names of the makers or their initials, and these have been identified with the names of several burgesses, such as members of the Hunt family, who were admitted freemen of the City of Bristol in the middle of the seventeenth century. Together with the pipes were found Bristol farthing tokens of 1652, a piece of Delft pottery dated 1647, and a brass seal-top spoon, all corroborating the dates of the pipes.

Mr. J. McAndrew read a paper on the early churches of Asturias, which was illustrated by lantern slides prepared from drawings and photographs by Mr. J. C. Stenning. The following is a *résumé* of the paper:—

After the defeat of the Visigothic King Roderick by the Moors on the banks of the Guadalete, A.D. 711, and the subsequent withdrawal of the Christian leaders to the mountains of Asturias, a period of about fifty years elapsed before the dynasty was re-established at Oviedo. The first building of which any trace remains is the Camara Santa, or Holy Chamber, in the cathedral of that city, built for the reception of the relics which were carried northwards after that battle—and probably only the sanctuary is of that early date. Almost simultaneously, the Church of Santullano, on the outskirts of the city, was founded by King Troila (757-68), and remains very much as he left it, with the exception of some modern additions. Externally it is cruciform, high in proportion to its area, having flat buttresses, and windows of which the upper half displays elaborate wheel tracery. Internally, the church is a basilica, the transepts being shut off. The east end is square. The church of San Salvador de Val de Dios, some eighteen miles north-east, was consecrated A.D. 893. This church is also a basilica on plan, and has a cloister running along the south side of the nave. The windows, both of the church and cloister, have tracery similar in feeling to that already described.

San Salvador de Priesca, consecrated A.D. 915, is very similar in plan and ornamentation to the preceding two. It has a vestibule with closed chambers on either side, and the nave consists of three bays. A low screen of grey jasper emphasises the high altar. The length and breadth of this church are in better proportion than those of the others, and there is evidence of progress in architectural knowledge. These three churches may be taken as forming a group distinct from others coeval with them.

Sta Maria de Naranco, close to Oviedo, is *sui generis* a parallelogram on plan having the entrance from a porch on the north side, with arches carried all round the building, and the east and west ends screened off by an open arcade make it questionable whether it was originally designed as a church; the columns of the arches are clusters of four, with a cable or twist pattern. The capitals have figures of animals, birds, and men in low relief on their front enclosed in scrolls, and on the sides (facing east and west) they are enclosed in cable patterns of W shape. Overhead is a plain bold cornice, with bands supporting the semi-circular or waggon-head vaulting, from which medallions or shields depend, each one above a pillar and between two arches. Externally, the church is much blocked up by a modern sacristy and the priest's house. The date, according to an inscription, is A.D. 848. Close by is the Church of San Miguel de Lino, erected almost simultaneously, which also lends weight to the theory that Sta Maria may have been originally constructed for secular purposes) a great contrast to its neighbour. It is high and narrow, complicated in plan, cruciform, having flat buttresses, ornamented with very shallow flutings, round-headed windows displaying very complicated geometrical patterns in the upper half, and borne on rude columns with foliaged capitals. The entrance at the west is flanked by square piers, with very rude figures enclosed in panels of leafage and circular flowers—it leads into a vestibule, on either side of which, approached from the transepts, is a chamber and staircase leading to a western gallery; over these chambers are two others, the access to which is closed entirely. The uses of all of these is uncertain, though Morales says that the lower ones held the books and other accessories to the church services. The transepts are reached between pillars 12½ ft. high, having arches of 3 ft. in height, and there are evidences of a screen having crossed the building to the eastward of them. The east end is low, and apparently has been rebuilt.

A few miles south of Oviedo is Sta Cristina de Lena, dating from ninth century; it is cruciform, with many buttresses externally. The entrance at the west-end has a gallery over, approached from the north side of the nave. The transepts are closed except that a low circular archway gives access to them. Eastward of these arches are flights of steps, between which is the lower altar; they give access to the raised east end, approached through an arcade similar to those at Sta Maria de Naranco, and the centre arch has a low screen (or reredos to the lower altar) carved with a rude honeysuckle and circular flowers in panels. The capitals of the pillars are very similar to those at Sta Maria. It is very difficult to convey an idea of this church by description, and the only views available to us fail to show the reduced size of the building owing to its many parts. The wall of this church are said to be only 1 ft. 9 in. thick.

The Latin influence throughout all these buildings is very interesting and curious; the first three are basilicas in plan, without any divergence, and Dr. José Caveda, in his "Ensayo Historico" (Madrid, 1848), points out the close analogy between these little buildings and the churches of Rome and Ravenna. Traces of work of eighth and ninth century may be found in many other churches throughout this mountainous and most picturesque region.

Mr. Bunnel Lewis read a paper on the Antiquities of Toulouse. After a brief notice of the history of the city, he proceeded to describe some of the most important monuments still existing there. Of the inscriptions one is far more remarkable than the rest. It belongs to the republican period and consulate of Fufius, a colleague of Vatinius, against whom Cicero spoke an oration, and commemorates the erection of a temple, and mentions the attendant priests who superintended the work. The words "Basis" and "Solarium" occur in it; some explain them to mean a pedestal and sundial, others, with more probability, a foundation wall and terrace. The Museum of Toulouse contains a collection of local antiques richer than any other to be seen in France: most of these come from Martres, near St. Gaudens, and during the years 1897,

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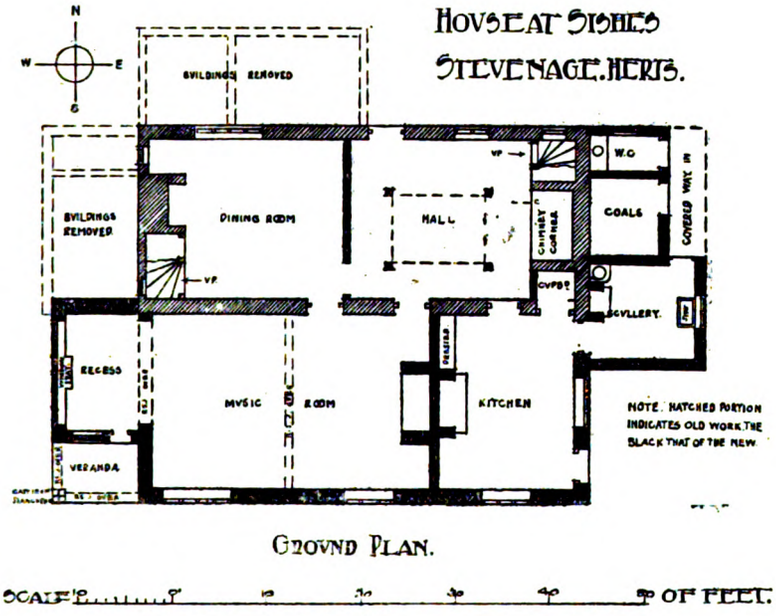

GROUND PLAN.

HOUSE AT SISHES STEVENAGE, HERTS.

1898, and 1899 many discoveries rewarded the efforts of the explorers. The paper was illustrated by many engravings from the Album des monuments du midi de la France and by a series of photographs which Monsieur Leon Joulin most kindly contributed.

"LOCAL LONDON."—This is a cheap and useful little work, published by Messrs. P. S. King & Son, Great Smith-street, Westminster. It claims to be a municipal directory for the metropolis and its suburbs, and it contains much information as to the several corporations, Councils, and Boards within the County and City of London and of sixty adjoining areas of the counties of Middlesex, Surrey, Kent, Essex, and Hertford, and also the principal legal, educational, charitable, and other institutions therein. Considering the size of the book, it is astonishing how much information it contains

HOUSE AT SISHES, STEVENAGE, HERTS.

THIS house, recently completed, consists of alterations and additions to what originally was the convalescent home for the district of Stevenage, a brick building about 150 years old.

The old part has been entirely gutted, and a roomy hall with an open gallery over on the first floor has taken the place of the old kitchen, but the large old-fashioned fireplace has been retained.

The building stands in extensive well-wooded grounds on the slope of a hill facing due south. The new parts have been built of local brick with hollow walls rough-cast, and roofed with Broseley tiles. The house contains, together with the old part, five bedrooms, bath, water-closet, box room, dark room on first floor; and on ground floor, music room (about 30 ft. by 16 ft.), dining-room, hall, kitchen, &c. A special feature is the extensive attic accommodation.

In addition to the foregoing there are coach-house and stables.

The whole of the building, together with the drainage, rain water storage tanks, cess pit, &c., have been carried out by Mr. W. J. Spratt, builder, Stevenage, from the plans, and under the superintendence of Mr. K. Gammell, architect, London.

ARCHÆOLOGICAL ACTIVITY IN CYPRUS.

VERY little has been done of late years in Cyprus—the treasure-house of every variety of ancient art from pre-historic cave-dwellers to the refinements of the Italian Renaissance—to care for or study the monuments which are so thickly strewn over the once-favoured land. Once more, however, the diggers have been at work searching for the buried treasures of human art and industry beneath the gradually accumulating earth heaps of a ruined Turkish town. This time an added note of interest consists in the fact that the buried treasure in question is of mediæval and not classic date. Wherever one digs in this most historic of islands classic antiquities come to light almost as a matter of course, but the remains of the interesting little Lusignan kingdom founded by our King Richard Cœur de Lion, which are, perhaps, of an even more unique character, have hitherto attracted a comparatively small amount of public interest in England.

Some three years ago a monumental book on the mediæval antiquities of the island, written by M. Enlart, of Paris, and published at the expense of the French Government, gave the art world of Europe some idea of the singular interest attaching to that little-known dependency of the British Crown, Cyprus.

M. Enlart has been again visiting the island with the intention of supplementing his great work by some discoveries regarding the old royal palace of the Lusignans at Nicosia. The

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French Government has again shown its liberality in the cause of research, and commissioned an investigation of the site generally considered to have been occupied by this building. The site in question has, however, proved to be nothing more than a mound of ruins—once probably a church built by the Venetians, and afterwards turned to the use of a Turkish battery during the famous siege of 1570. Little of interest was found here beyond the plan of the ancient conventual church (apparently of the Franciscan Order), with three tombs still covered with the usual sculptured tombstones occupying the centre of the nave before the entrance of the choir. The carving on the tombstones is of the ordinary sixteenth-century Italian style, and the ancient floor of the church, laid bare from earth and débris, reminds one of some old church in Italy, and marks how in former ages the characteristics of a race survived under the changed conditions of climate and surroundings in a comparatively distant colony.

The results of the present investigation have not proved very great, but still a certain amount of interest attaches to the effort, in as far as it proves that archæological interests in the Levant are not quite extinct. Fifty years ago the studies made by De Vogüe, Rey, Texier and Pullan, and a number of other *savants* aroused a great deal of interest in Europe; but since then the nearer East has been comparatively neglected, and as a consequence the monuments, whose history is second in interest to none, are disappearing, forgotten and uncared for, the natural prey of the unscrupulous speculator or ignorant native. All honour to the French Government, which still recognises the importance of historical memorials, and sends its students to prosecute their study in distant and alien lands.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Finsbury Borough Council 1,175*l.* for alterations to the town hall; the Fulham Borough Council 23,100*l.* for an extension of the town hall; the Stepney Borough Council 9,325*l.* for street improvement; the Woolwich Borough Council 2,000*l.* for a site for municipal offices; the Stepney Borough Council 6,938*l.* and 9,914*l.* for paving works; and the Strand Guardians 3,800*l.* for the purchase of land.

Fire Station, Euston-road.—The Fire Brigade Committee reported as follows, the recommendation being agreed to:—

"We have had under consideration the tenders, referred to us by the Council on February 26, 1901, for the erection of the proposed Euston-road station. From the gross amounts of the tenders it is necessary to subtract the totals of addenda bills (in respect of work originally contemplated, but which it was subsequently determined should not be executed) attached to the bills of quantities. The result is as follows:—

	Gross Amount.	Net Amount.
Messrs. Stimpson & Co.	£15,000	£14,352
„ Holloway Bros.	15,500	14,603
„ Martin, Wells, & Co.	15,835	14,952
„ J. Willmott & Sons...	16,675	15,051
„ Foster Bros.....	17,475	16,598

We may remind the Council that its decision of January 29, 1901, to invite tenders by public advertisement for the work was come to in consequence of our having reported that the manager of works had expressed himself as not satisfied of the sufficiency of the architect's estimate of 13,764*l.* We reported to the Council on March 19 that we considered that quantities of the work should be taken out afresh. This has been done, but, having had before us a report by the architect on the subject and given full consideration to the case, we think that the first set of quantities should be adhered to, and that the lowest tender based on those quantities, viz., that of Messrs. Stimpson & Co., should be accepted. This firm has recently intimated that it is prepared to abide by its tender of February 26 last, subject to the time allowed for the execution of the work being extended by two months in view of the circumstance that the roof will not be on before the winter months, as would have been the case had operations been commenced last March. We agree with the architect that this request is reasonable. Messrs. Stimpson & Co. have in the past executed for the Council and its predecessors a considerable amount of work, including the erection of several fire stations. The Architect has pointed out that there are two slight errors in the moneying out of items in the bills accompanying Messrs. Stimpson & Co.'s tender, and that after allowance is made for these the net amount of the tender is 14,377*l.* 2s. 6d. The estimate of 15,200*l.* approved by the Council on January 29, includes a sum of only 13,764*l.* in respect of the erection of the building, and it is therefore necessary to ask the Council to approve of a supplemental estimate of the difference (in round figures 620*l.*) between this amount and Messrs. Stimpson & Co.'s tender. We recommend—That the supplemental estimate of 620*l.* submitted by the Finance Committee in respect of the erection of the proposed Euston-road station be approved; that the tender of Messrs. Stimpson & Co. to execute for 14,377*l.* 2s. 6d. the work of erecting the station be accepted. . . . .

Electric Traction in South London.—In connexion with the electrical working of the London County Council tramways, the Council decided to enter into an agreement with the South London Electric Supply Corporation, providing that (*a*) the company should permit the Council to erect a temporary building at the company's electricity generating station near Loughborough Junction, and to place therein two 2,000 h.-p. continuous-current sets of electricity generating plant and auxiliaries, and also to place therein temporarily two Stirling boilers; (*b*) that the generating plant referred to should be worked by a staff in the employ of the Council; and (*c*) that the company should be paid by the Council at the rate of 1·4d. per unit of electric current used for working the tramways.

The New Street from Holborn to the Strand.—Mr. H. Smith asked if the Improvements Committee had yet decided on the name of the new street from Holborn to the Strand.

Mr. W. Davies said the Committee had been overwhelmed with suggestions, both wise and otherwise. Next week the Committee would consider the names.

The View from Richmond-hill.—Replying to a question by Mr. Dickinson, Lord Monkswell said it was a fact that the landowner had commenced to cut the trees at Richmond-hill, and there was a danger, if it was continued, that the view from the Star and Garter would be seriously imperilled, if not destroyed. He had seen a letter to the effect that the landowner was not willing to sell, but if he could do anything to assist in opening up negotiations between the landlord and the Council he would be extremely happy to do his best in the matter.

The Council adjourned shortly before seven o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage.

Greenwich.—Three houses, with shops on the ground floor, on the north-east side of Blackwall-lane, East Greenwich, near the entrance to Blackwall Tunnel (Mr. E. Petters for Mr. W. Timms).—Consent.

Fulham.—Projecting shop fronts to five houses in course of erection on the east side of Stephendale-road, Fulham, northward of Lindrop-street (Mr. W. C. Poole for Mr. J. Wilson).—Refused.

Width of Way.

Kennington.—New school buildings and boundary fence-walls at less than the prescribed distance from the respective centres of Randall-road and Randall's-row, Lambeth (Messrs. Beazley & Burrows for the London and South-Western Railway Company and the Managers of the St. Saviour's Salamanca School).—Consent.

Hackney, South.—†Three-story dwelling-houses on the south-west side of Middlesex Wharf, Lea Bridge-road, Hackney, at less than the prescribed distance of the centre of Middlesex Wharf (Messrs. J. G. & H. G. Needham for Mr. T. Marvell).—Refused.

Line of Frontage, Width of Way, and Projections.

Marylebone, East.—A porch at the entrance to No. 4, Albany-terrace, Marylebone-road, St. Marylebone, at the corner of Albany-mews (Mr. E. R. Robson for Mr. S. Lee).—Consent.

Width of Way and Construction.

Marylebone, West.—A deviation from the plans approved for the erection of a block of buildings, to be inhabited by persons of the working class, on the east side of Ashland-place, St. Marylebone, to abut also on Paradise-street, so far as relates to a reduction in height of the front wall of the block of buildings and the erection of three sham gable ends and of an iron, concrete, and slate screen on the flat roof of such block of buildings (Mr. T. H. Watson for the Portland Industrial Dwellings Company, Limited).—Consent.

Deviation from Certified Plans.

St. George, Hanover-square.—A deviation from the plans approved for the erection of club chambers, with shops on the ground floor, on the site of No. 5, White Horse-street, Piccadilly, and stabling at the rear, so far as relates to the arrangement of the front portion of the ground floor of the building, by the omission of the proposed shops and the substitution of a breakfast-room, and an alteration in the position of the staircase and entrance hall (Mr. E. Howley Sim for Mr. G. H. Tod-Heatly).—Consent.

Means of Escape from Top of High Buildings.

City.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the attic story of an extension of the Great Eastern Hotel, Liverpool-street, City (Mr. T. Holloway, of Messrs. Maple & Co, Limited, for the Great Eastern Railway Company).—Consent.

Formation of Street.

Bow and Bromley and Hackney, South.—That an order be issued to Messrs. Wigg, Oliver, Hudson, & Co., refusing to sanction the formation or laying out of a street for carriage traffic out of the north side of Carpenter's-road, Hackney Wick, Hackney (for the trustees of the late Viscount Eversley).—Agreed.

Buildings for the Supply of Electricity.

Hackney, South.—A generating station and works on the north side of Millfields-road, Hackney (Messrs. Gordon & Gunton for the Council of the Metropolitan Borough of Hackney).—Consent.

Cubical Extent.

Hoxton.—The erection of Block D of a warehouse building on the north side of Scrutton-street, Hoxton, to exceed in extent 250,000, but not 450,000 cubic feet, and to be used only for the purposes of the trade of a printer and lithographer (Messrs. Gordon & Gunton for Messrs. Waterlow & Sons, Limited).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

TRADE CATALOGUES.

THE Luxfer Prism Syndicate send us an illustrated catalogue of their copper-electro glazing as employed in decorative designs in stained or white glass. As in the case of the Luxfer prism glass, the copper frame-work is practically welded to the glass by deposited metal under an electric process. The result is a window both stronger and lighter than a window of leaded glass of the same area and the same proportion of metal framing; and the use of saddle-bars can be dispensed with. The copper framing is used in two forms, either in a very small bar section with a groove for the glass, or in a strip or ribbon form, the ribbon standing up at right angles to the plane of the glass, and forming the constructive core to be subsequently covered by the electro-deposited metal which gives it its final form and binds the glass to it. As to the strength of the glazing thus treated we have satisfied ourselves by examination of the work. To have got rid of the saddle-bar is in itself a very important practical advantage; saddle-bars to stained windows can only be regarded as, in the case of leaded windows, an unavoidable evil. Artistic effect is another question. Both the dark colour and the wide proportions of the leading in the usual form of stained glass window unquestionably add to the effect of the colour in the glass, and give to stained glass windows the peculiar character which we have long associated with them. The copper framing of the new process appears, in comparison, both too thin and too bright; but we do not know that any attempt to get the copper strip or section made wider would be desirable. To have it made more bulky than is actually necessary for stability would be unpractical and wasteful of material, and therefore out of character; and the bright surface of the copper, also, would have quite a different effect from that of the sombre lead. The best thing seems to be to admit that glass fixed in this way must be designed in a manner of its own and for its own special effect, in a style distinct from that of stained

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glass of the Mediæval school. Considered in that light, the system, an important improvement in a practical sense, may come to have its own artistic character. For the treatment of white glass in small squares and in geometrical designs it is exceedingly well adapted.

The Fireproof Plate Wall Company send us a pamphlet describing and illustrating their form of partition, which we have before mentioned in connexion with the Building Trades' Exhibition. This is a partition composed entirely of plates or slabs of fire-resisting material, jointed together by intersected passages. In the centre of each plate there is formed a vertical through passage, and on each side of this a number of air chambers, which do not extend the whole height of the plate. Each plate is filleted on the top edge and grooved on the bottom edge, and each vertical edge has a semicircular groove; these grooves, when the plates are placed in rows to break joint, form a vertical passage in line with the central passage in the rows above and below. As each row is placed in position the plates are jointed with cement, and liquid cement is poured down the vertical passages, filling up those which are open, ascending those which are closed, so far as the compressed air will allow, and filling up the horizontal joints in their entire length. This is continued course by course until the wall is completed and formed into one sheet as though cast in a large mould.. It is claimed that great strength is given to the wall by the cement columns formed in the whole of its height. Walls up to 13 ft. long by 11 ft. high may be erected with plates only; but where larger walls are required, or for the purpose of giving extra stability, iron tubes or rods are cemented into the vertical passages, extending through the whole height of the wall, at such distances as may be considered desirable according to the requirements. These tubular stays render it practicable to build walls of several hundred feet area without other supports. The work can also be done very fast, without interfering with its efficiency. The system appears to be one of the best of the modern methods of forming party-walls that has come under our notice.

Messrs. W. A. S. Benson & Co. send a pamphlet describing their pavilion at the Glasgow Exhibition, which appears to be of considerable interest; it was perhaps, like some other things, not finished at the time of our visit. An illustration is given of a form of window which consists of casements and panels of decorative design, cast throughout in iron, and built up, according to size, into sections which are supplied ready for erection. "The circular uprights permit of the construction of bays of any angle, and the panels and casements with their attendant sills are designed in graduated sizes so that they can be accommodated to a wide range of openings. This window being supplied complete with mullions does away with the work of stonemasons and joiners, the sections merely requiring to be screwed up." This may be a convenient form of window to employ where a certain decorative appearance is to be produced in a short time, but we cannot say that the illustration of it recommends it very much to us as a matter of design; it is not simple enough and looks too much like an effort to be ornamental. The pamphlet also draws attention to a mode of construction used in the pavilion, and which is called "Texyl," the basis of which is cement applied to corrugated sheet iron in such a manner as to form an absolute bond of great tensile and bearing strength. "Its employment, whether for roofs, partitions, or temporary buildings, permits of much economy in structure. In the case of roofs it dispenses with all need for the common rafter, and occasionally of everything beyond the main framework. The sloping roof of the Pavilion, 19 ft. long, is carried upon a central ridge, the walls, and the gable rafters, with only a stiffening piece between it and the coved ceiling beneath. A good method of tiling which Texyl renders possible is here illustrated as well, the tiles being bedded flat in cement instead of overlapping. A roof constructed thus takes only one-third the quantity of tiles used in an ordinary tiled roof, and is at the same time very much more durable and weather proof." In regard to the last named point, it all depends on the cement. It is very desirable to have a means of using tiles as a roof covering flat and bedded in cement, in some situations, as for instance on the exterior of a dome; but, as we say, the durability and weathertight quality entirely depend on the cement, and where an ordinary sloping roof is to be visible the tiling with lap and showing the edges has a better effect.

An interesting catalogue, entitled "Types of Sewage-Disposal Works," has been compiled by Mr. S. H. Adams, A.M.Inst.C.E., managing director of the Adams' Patent Sewage-Lift Company. The fittings described and illustrated include timed siphonic apparatus for automatically filling and emptying filter-beds, siphons arranged to discharge automatically and simultaneously, sewage-screens, automatic sewage-lifts, and other apparatus required in connexion with sewage purification by bacteriolysis, as well as ordinary flushing siphons, &c. In addition to the illustrations of the fittings themselves, views and geometrical drawings are given of sewage-purification works, with the different apparatus *in situ*. The views represent actual installations carried out for private individuals and for public authorities, and are, therefore, of interest both to the architect and engineer. The geometrical drawings include works of various sizes, suitable for villas, mansions, asylums, villages, and towns, and cannot fail to be of service. The special features of the siphonic apparatus are the automatic action and the absence of moving parts. By the air-controlled feed and the timed siphonic apparatus it is possible to work a series of filter-beds automatically, the beds being filled in succession and emptied in the same order, any desired length of contact being obtained by the regulation of the tap through which filtrate passes to the siphon. By these means more uniform results are obtained than with apparatus controlled by hand, and the cost of working the beds is also reduced. The sewage-lift is particularly ingenious; it is automatic, and has only one moving part—a plain inlet flap-valve. A word of praise must be given to the draughtsman and photographer who have prepared the admirable illustrations, and to the printer who has reproduced them so well; the paper and type are also excellent. The catalogue is one to keep, not to throw into the waste-paper basket.

The Acetylene Corporation of Great Britain send us a catalogue of appliances for the generation and use of acetylene. The generator made by this Corporation is that known as the "Auto-Simplex," in which water is automatically supplied to carbide as the gas in the gasholder made from the preceding charge is withdrawn for consumption. It is stated that all fire insurance companies allow an Auto-Simplex installation to be introduced without extra premium, and the Acetylene Corporation undertake to get any fire policy endorsed to that effect before erecting the acetylene plant. The Corporation undertake for a small annual payment periodically to examine and maintain in good working order any installation introduced by them, provided that the carbide, burner, and purifying material are always supplied by them. We should not recommend any acetylene consumer to bind himself to such conditions, since the prices charged by different firms for carbide of the same quality vary considerably, and it would be foolish to undertake not to use any better burners or purifying system which may possibly be introduced at some future period, and which may not be approved by this particular Corporation. The price of carbide, when purchased in quantities of not less than 1 cwt. and delivered to stations in England, is quoted at 2½d. per lb., which is equivalent to 23*l.* 6s. 8d. per ton. The Auto-Simplex apparatus has been introduced into a number of country houses, factories, and business premises, and is also employed for generating the acetylene used for lighting the Church of St. Mary, at Great Massingham.

The Van Kannel Revolving Door Company send us a descriptive and illustrative pamphlet of their revolving doors, about which a question was asked by a correspondent in our columns the other day. Many of our readers are no doubt acquainted with it, though it appears that some are not. The typical form of the door is one with four arms at right angles, with a common centre, and with segmental jambs so arranged that the passage of air is always closed by one or other of the arms; when any one enters by pushing the arm before them, that behind him closes the entrance before the other one clears it for his passage. This is, of course, a most efficient way of avoiding draughts from doors opening and shutting in places such as public dining-rooms and restaurants, where there is a constant passage of people in and out. For certain occasions the wings can be folded flat and form a centre division between an ingoing and outgoing crowd. In the ordinary use of the revolving door there is the objection that those going in may not be quite in accord with those going out as to the speed at which the door is to be turned. Nor can we quite agree that this form of door lends itself especially to architectural effect. But for certain classes of buildings its advantages certainly far outweigh its disadvantages.

We have received from Messrs. Atkinson's Testing Works, Cardiff, a catalogue of their dead-beat ammeters and voltmeters. These instruments are specially adapted for use in connexion with electric motors. They give the means of telling whether the motor is overloaded, and they also enable the consumer to check the meter bill. The ammeters are for use with continuous current, and are made of all sizes. The scale is vertical, and can be read at a distance of many yards. They are unaffected by external magnetic fields, and every instrument possesses an adjustable indicator to show the proper working point on the scale. The price of all sizes of ammeters is only 1*l.* 3s. 6d., and the voltmeters are only slightly dearer.

We have received from the General Electric Company of Queen Victoria-street a leaflet describing some of their latest novelties. The "Robertson" low voltage traction lamp has been specially made to withstand vibration and is the one used on the Central London Railway. The balancing coils they make for running one eighty-volt enclosed arc lamp from a 200-volt alternating current circuit are very cheap and ought always to be used in preference to the so-called 200-volt enclosed arc lamps which are very inefficient. They now enclose batteries for bell work in boxes made of leather board which are said to be both lighter and cheaper than the ordinary wooden boxes.

M. George Averly (Lyons) sends a catalogue with description and illustration of his electric pottery blocks, which have a lifting mechanism driven by electricity. It is claimed that by means of these blocks one man can lift and manœuvre weights of from 1 to 20 tons with ease and without risk. They are in fact pulley blocks with an electric motor connected with the pulley wheel and supplied with power by a wire. Mr. Thomas Veasey is the London agent for the Averly electric pulley blocks.

Messrs. Shipham & Co. (Hull) send an illustrated catalogue of their joints for expansion and contraction in steam-pipes. These consist principally of wrought copper insertions between two lengths of steam pipe, in different forms: There is the "bellows" expansion joint, in a bulbous form capable of drawing out or flattening, and several forms of loop joint of copper piping. The company also make stuffing-box expansion joints in cast iron.

Messrs. Julius Sax & Co. send us a sheet giving illustrations and description of their desk fans and ceiling fans, for continuous or alternating current; the ceiling fan being a horizontal one working round a vertical axle suspended from the ceiling.

Mr. Howard W. Meredith sends us a very extensive catalogue of builders' hardware. Of the decorative character of the chimneypieces the less said the better, for the most part; there are a few on pages 26 and 54 to 56 which are better than the rest, but there does not seem to be any consistent effort to produce the best class of design, such as we fortunately now see made by some firms. The bulk of the catalogue, however, deals with practical things, and in this respect it is a most extensive and important one, including apparently everything that can be required in the fitting-up of a house.

Messrs. Dunkerley & Co., Manchester, send a conveniently small book containing a list of their constructional iron-work always in stock, including rolled-iron and steel joists, compound and rivetted girders, stanchions, &c., with sections given; iron flats, angle tees, sheets, &c.; with some useful statistical tables of weights.

CHURCH RESTORATION, HAMPSTHWAITE, YORKSHIRE.—The corner stone of the new south aisle of the old parish Church of Hampsthwaite was laid recently. Some twelve months ago Mr. Hodgson Fowler, F.S.A., of Durham, was consulted respecting the reconstruction of the church, and on his report it was decided to rebuild a portion of the sacred edifice at an estimated cost of 2,400*l.*

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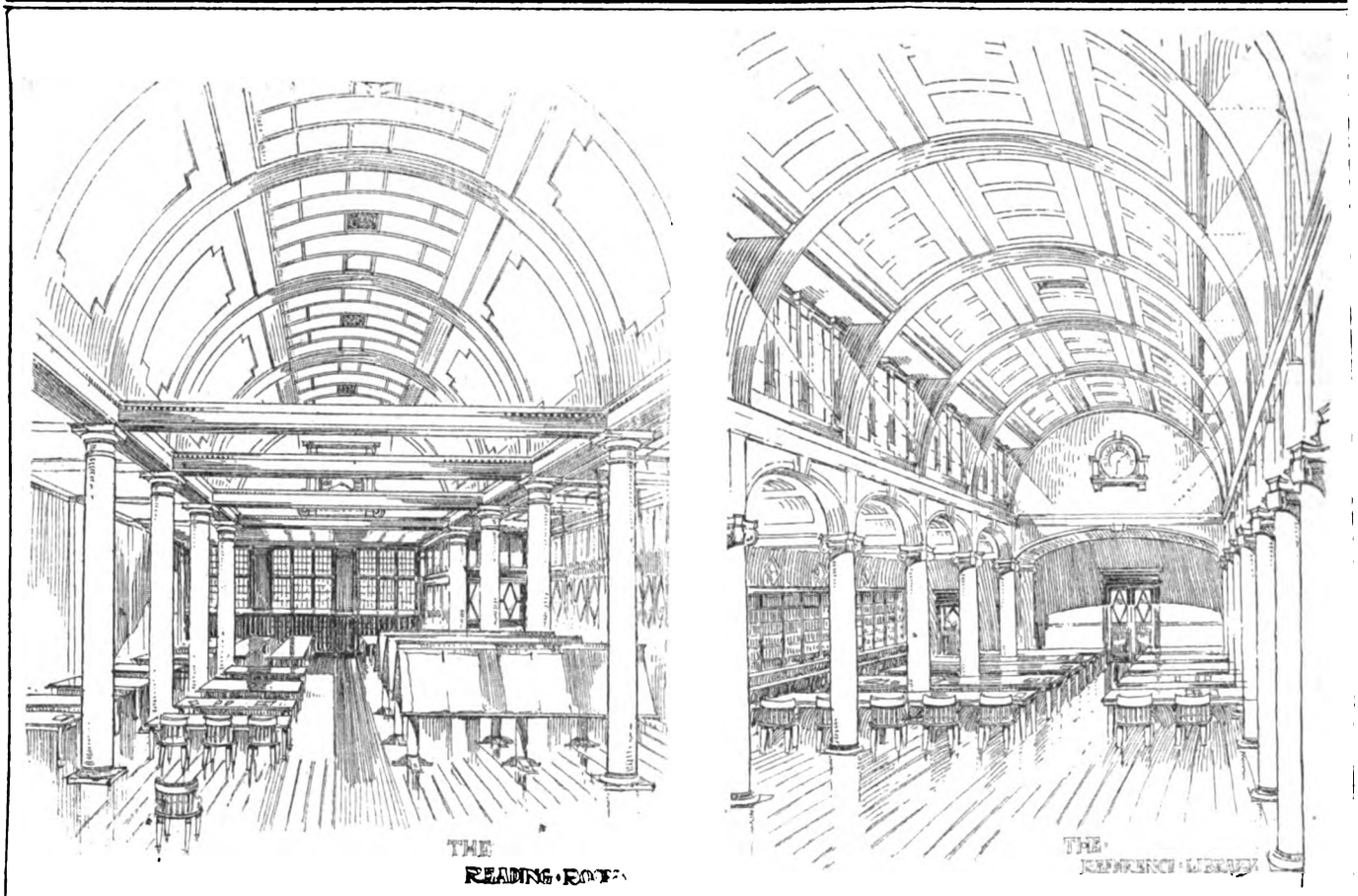

Interiors in New Public Library, Keighley, as proposed.

Illustrations.

THE JEAN MACÉ MONUMENT, PARIS.

THE illustration of this fine monument is from the model of it which was set up in its intended position in the middle of the Square Armand Carrel, Paris, in order to study the effect in position. The finished work, with marble steps and pedestal and bronze figures, formed one of the most prominent central objects in the sculpture court of the Old Salon this year, and was specially noticed and described in the article on the Salon in our issue of May 25. We regret to add that since that date the accomplished sculptor, M. Paul Arthur Massoulle, is dead. A short notice of his life and work appeared under the head of "France" in our Foreign column in the issue of June 29. The architectural portion of the monument is designed by a young architect, M. Charles Blondel.

The late M. Jean Macé was a Professor of History who had done much to popularise its study by writing books for children, and also exercised a great deal of influence in procuring the foundation of many schools and public libraries. Having these facts in view, the signification of the figures on the monument is obvious enough. The figure above holds up the open book as a symbol of intellectual progress and liberty of thought; the two children below are encouraged in their course by the genius of Education. The eager and bright-looking boy, pressing forward in his walk, is a charming and most significant figure.

The medallion portrait of Jean Macé is seen on the central block, which forms the architectural centre of the monument. This affords a good illustration of that favourite treatment of personal monumental design among the French, in which the portrait of the person commemorated is merely represented by a bust or a medallion, and the sculptor is relieved from the necessity of realistic representation of the figure, and is left free to indulge his fancy in allegorical and imaginative treatment. In England, a monument to a man who assisted in founding schools and libraries would only too probably take the form of a full length and perhaps colossal statue of a gentleman in frock coat, trousers, and boots, with a book in his hand.

KEIGHLEY FREE LIBRARY.

THIS design was places first by the assessor, Mr. Leonard Stokes, in a recent competition in which 146 designs were submitted, and is now to be carried out with some slight modifications.

The disposition of the plan is explained by the fact that on the south side of the site sufficient land was provided for future extension; the principal rooms were consequently placed on this side.

Accommodation is provided as follows: (Ground floor) newspaper reading-room for 150 readers, separate ladies' room; lending library space for 40,000 volumes; (first floor) reference library 4,000 superficial feet and accommodation for 40,000 volumes; patent library 2,000 superficial feet; store for valuable books; rooms are provided for the staff (both sexes), workroom and store-rooms on the ground and basement floors.

The building will be faced with local freestone and the roofs covered with green Westmoreland slates.

Internally the walls will be plastered down to dado, which will be of dull glazed tiles—the floors of the principal rooms are to be of wood block on concrete and those of the halls of marble mosaic; the ceilings of plaster panelled in simple forms; the woodwork generally of pine stained a suitable colour and varnished.

The buildings will be heated by hot water at low pressure and lighted by electricity.

The estimated cost of the buildings is 10,000*l.*

Messrs. McKewan & Swan, of Birmingham, are the architects.

PROPOSED NEW NAVE AND CHANCEL, ST. GEORGES, FORDINGTON.

THIS design was made as a proposed substitute for a north aisle erected in 1830, in the style which may be supposed from the period, and in order to avoid pulling down the existing chancel, a good piece of Georgian work, but too small for the present purposes of the church. No decision, however, has as yet been come to in the matter.

The drawing was exhibited at the Royal Academy of 1900. Mr. W. D. Caroë is the architect.

VILLAGE CLUB, PENSHURST.

THIS picturesque little country club was built from the designs and under the superintendence of Mr. Maxwell M. Smith, architect.

The ground floor contains entertainment hall, reading-room, lavatory and two bath rooms, with a room for bicycles, and the living room and kitchen of a small residence, with bedrooms above. On the upper floor is a billiard room, the remainder of the space (except the upper floor of residence) being occupied by the upper portion of the entertainment room and a gallery at one end of it. The entertaining room block is the rear one in the illustration.

The building is constructed of local stone, brick and timber, oak being mainly used, and built by local labour.

In the entertainment hall the swinging lights are arranged so that their reflectors can throw the light either on to the stage or into the room, as desired. Over the proscenium is a relief in plaster, of St. George and the Dragon, modelled by Mr. Michael Murphy.

The total cost has been about 4,250*l.*

FERRY WORKS, QUEEN'S FERRY, CHESTER.

THESE buildings were carried out for Messrs. Willans & Robinson, makers of water-tube boilers, from the design of Mr. H. B. Cresswell, architect, of Rugby.

The plan is of no special interest; the buildings are essentially vast covered sheds to work under. We illustrate them because they represent a highly creditable attempt to give a certain amount of character to a practical structure of this kind, in a manner naturally arising out of structure, and without any introduction of superfluous and unmeaning ornament.

The following is the architect's description of the work:—

"The design attempts to give candid architectural expression to engineering workshops. The buildings lie seven miles west of Chester, between the London and North-Western Railway Company's main line and the river Dee, and have been laid out by Messrs. Willans & Robinson, Limited, for the construction of Niclausse water-tube boilers.

The building on the left hand of the drawing is the packing and forwarding shop, the next combines erecting and machine shops, the building with the tower is to contain the machinery for providing hydraulic and electric

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power for the works, and the large block on the extreme right is where the tube drawing and drum making processes will be carried out.

The shops are arranged in 50-ft. bays, with C. I. stanchions, spaced 20 ft. apart, carrying the girders on which the travelling cranes run, and the wood 'bow string' roof covered with boarding and felt. The buildings are faced with Buckley purple brindled bricks; the strings and copings are of hard vitrified purple brick ware, made also in the Buckley district. The piers have a batter of about one in fifteen and the lower portions have heartings of concrete. The door and window lintels are of cast-iron with shaped feathers at intervals, and the usual coverstone is elaborated with brick corbelling and with piercings which go right through the wall and serve for ventilating purposes. The windows are cast-iron; the window-cills and door jambs of hard purple brick. The tower attached to the power station was to contain, as here shown, fire hydrant service and other water tanks, and a lift for coal trucks; but it has since been enlarged and redesigned to enclose the hydraulic accumulators for the tube-drawing processes.

The works are being carried out under contract by Messrs. Foster & Dicksee, of Rugby and Chelsea. The glazing of the roofs is by Messrs. Helliwell's system, and the roofing has been supplied by Messrs. Anderson & Son, of Belfast."

HOUSE, CONNECTICUT, U.S.A.

THIS is an example of a modern American house, built in Connecticut, from the designs of Mr. F. R. Comstock, architect, of New York.

The exterior is of granite, with plinth and dressings of buff-coloured pressed brick. The roofs are slated.

The plan illustrates some of the characteristics of American planning in small dwelling houses.

BOOKS RECEIVED.

ELY: THE CATHEDRAL AND SEE. By the Rev. W. D. Sweeting, M.A. (Geo. Bell & Sons.)

BRISTOL: THE CATHEDRAL AND SEE. By H. J. L. J. Massé, M.A. (Same Publishers.)

BATH, MALMESBURY, AND BRADFORD-ON-AVON. By the Rev. T. Perkins, M.A. (Same Publishers.)

GILLOW'S; a Record of a Furnishing Firm during Two Centuries. (Harrison & Sons.)

THE FRENCH STONEHENGE. By T. Cato Worsfold, F.R.Hist.S., &c. (Bemrose & Sons.)

The Student's Column.

GAS AND GAS FITTINGS:

2.—MANUFACTURE OF COAL GAS.

MURDOCH made his earliest experiments with gas as an illuminant in 1792 at Redruth, in Cornwall, and subsequently at Old Cumnock, in Ayrshire, the place of his birth. But it was after his removal to the works of Boulton, Watts, & Co., at Soho, near Birmingham, in 1798, that his most important work in gas-lighting was carried out. At the Soho works he collaborated more or less with James Watt, of steam-engine fame, and was allowed to erect a gas-making plant, which satisfactorily supplied a portion of the works of this celebrated firm with the new illuminant.

The early history of the gas industry is replete with interest and not devoid of humour, for many of the sensational claims made for gas by a popular lecturer and company promoter of the period named Winsor, and by other enthusiasts less cautious than the industrious Murdoch, appear very ludicrous in the light of present knowledge regarding the properties of coal-gas. It is interesting to observe that before inflammable gas was successfully employed for lighting purposes, efforts had been made to use it as a source of power. In 1801 Philipe Lebon, a French experimenter, in amending his patent of 1799, claimed the use of motive power obtained by the explosion of inflammable gas mixed with air; and in this country, as early as the year 1791, John Barber obtained a patent for "a method of using inflammable air for the purposes of procuring motion and facilitating metallurgical operations," which consisted partly in successively exploding mixtures of air and coal-gas. It is, however, necessary to here confine our attention to the study of the gas industry as it exists at the present time, and those desirous of tracing its development during the nineteenth century will find the subject exhaustively treated in King's "Treatise on Coal-Gas."

Although inflammable gas may be manufactured from so many different carbonaceous substances, coal is still used more extensively than any other material for the purpose of gas manufacture.

Coal.—The coals most largely employed in this country for gas manufacture are the bituminous coals of Durham and the neighbouring counties. The cannel coals of Scotland, Wales, and Northumberland yield the largest volume of gas, and the gas is of the best quality. At one time it was the common practice to mix a certain proportion of cannel with the bituminous coal in order to produce a gas of higher illuminating power than could be obtained from the bituminous coal alone, but about ten or twelve years ago the quantity of available cannel coal became so small, and its price so high, that it ceased to be used to any large extent in the southern counties of England, and the carburetted water-gas which was then introduced as a substitute for gas from cannel coal is now being used not merely as an enriching agent, but to a certain extent in many districts as a substitute for ordinary coal-gas itself. Anthracite and the various classes of steam coal are not used for coal-gas manufacture, because they yield very little gas, and are valuable for steam-raising purposes.

The quality and quantity of the gas yielded even by coals of the same class vary considerably, but as an indication of the results commonly obtained it may be said that ordinary bituminous coal should yield not less than 10,000 cubic feet of 15-candle gas per ton, while cannel should yield not less than 11,000 cubic feet of 28 or 30 candle gas.

Coke.—The average yield of coke from ordinary gas-coal is 1,360 lbs. per ton. The coke should be of good quality and not yield more than about 4 per cent. of ash when burnt. The average yield of coke from cannel coal is somewhat less, and, owing to the large quantity of ash it yields, the coke has no commercial value.

Retorts.—To obtain coal-gas from coal the coal is placed in cylindrical chambers called "retorts," from which air is excluded, and which are heated to redness in a furnace. At first the retorts were made of cast-iron and were placed in a vertical position, but they are now almost universally made of fireclay and fitted either in a horizontal position or inclined at an angle of 30 to 33 deg.

The retorts may be round, oval, or Ω-shaped in cross-section, the latter shape being the most common. The internal diameter of the retort is usually about 21 in. by 15 in., and the length of a "single" retort is 10 ft., or of a "through" retort, having a mouthpiece at both ends, is 20 ft. The retorts now commonly used may be divided into three classes—

(1) Singles, or retorts having only one mouthpiece;
(2) Doubles, or "through" retorts, having a mouthpiece at both ends;
(3) Inclined retorts, in which the coal is introduced at the upper end and the coke withdrawn from the lower.

Retorts with one mouthpiece only (fig. 1) are now seldom used except in small gasworks. The coal is introduced at one end only, the opposite end being closed with a fireclay back. In large works "through" retorts (fig. 2) are usually employed. These are double the length of the so-called "single" retorts, and are usually made in three pieces, jointed together. A mouthpiece is provided at each end of the retort, and coal is simultaneously introduced through each mouthpiece. Each mouthpiece is provided with a gas-tight lid or door. Inclined retorts or "slopers" (fig. 3) are usually Ω shaped and about 15 ft. in length. The angle of inclination is about 32 deg. The coal is fed into the upper end of the retort and distributes itself by gravitation over the inclined floor; and when the distillation is completed the coke is allowed to slip out from the lower end, the coke being stirred, if necessary, with a long rake. Inclined retorts may be charged and "drawn" with much less expenditure of manual labour than horizontal retorts, and when the coal to be carbonised is of uniform quality they may be used with success. When, however, the coal to be used varies greatly in quality and specific gravity, trouble is often caused by the coal failing to spread itself properly over the floor of the retort, and imperfect carbonisation, resulting in excessive agglomeration of the pieces of coke and a low yield of gas occurs. To break the force of the stream of coal as it is shot into the inclined retort, baffle plates have in some cases been adopted, and other devices have been proposed to make inclined retorts a greater practical success. Many gas engineers are now using them in great number, while others claim that for ordinary working conditions the horizontal retorts are better than any others.

Retort Settings.—The retorts are set in brickwork having joints made with fire-clay mortar. A number of retorts are grouped together over one furnace, and form a "bed." The number set in one bed varies in different works from three to twelve, but seven or nine laid in three tiers is the number most commonly adopted. The retorts are supported by the front falls of the bed, and by a number of walls erected within the setting. A number of beds built side by side in one block form a "bench" of retorts.

Heating the Retorts.—The retorts may be heated by direct firing from beneath, but this method of heating is rapidly being superceded by the so-called regenerative system. By the regenerative system the retorts are more uniformly heated, and their life is prolonged, while a higher heat efficiency is obtained from the fuel consumed. The regenerative system consists essentially in the conversion of the solid fuel into inflammable gas, the combustion of this inflammable gas in the chamber or furnace in which the retorts are fitted, and the utilisation of the heat of the products of this combustion as they leave the furnace for heating the air (called the secondary air) admitted to the furnace for the purposes of combustion. The generator in which the solid fuel is converted into gaseous fuel is usually situated beneath the charging floor of the retort-house. It is filled with coke heated to incandescence, and a carefully regulated current of air (termed the primary air) is allowed to pass up through it. The carbon of the coke combines with the oxygen of the air to form the inflammable gas, carbon monoxide. This carbon monoxide together with the nitrogen of the air admitted passes from the upper part of the generator into the overhead furnace in which the retorts are located. Here the carbon monoxide meeting with hot secondary air burns to carbon dioxide with the evolution of heat, which maintains the retorts at the required temperature.

The inflammable gas from the generator should contain about 30 per cent. of carbon monoxide; the remainder of the gas is mainly atmospheric nitrogen which will not burn, and which acts solely as a diluent which abstracts heat from the flame of the carbon monoxide. A small proportion of carbon dioxide is also always present in the generator gas owing to the imperfect control of the reaction between the oxygen and the heated coke; and small quantities of hydrogen and methane are usually present owing to the decomposition in the generator of a certain quantity of steam from the ash pans beneath the generator. The products of combustion which escape from the furnace flues to the main flue and thence to the shaft which terminates above the roof of the retort-house, should consist almost wholly of nitrogen and carbon dioxide. The channels which admit the secondary air to the furnaces are formed in close proximity to the furnace flues, so that the escaping products of combustion serve to heat the incoming air before they escape into the atmosphere. Sometimes the blue flame produced by carbon monoxide when it burns to carbon dioxide may be seen at the top of the shaft of the retort house. The presence of this flame shows that the current of secondary air admitted to the furnaces is not being properly regulated, and that the whole of the heat obtainable from the generator gas is not being utilised in the furnaces.

Ash Pans.—A pan containing water is placed under the furnace bars of each generator. The heat from the incandescent fuel and from the falling cinders vapourises a certain quantity of the water, and the steam passing up through the furnace bars tends to keep them cool and to retard the rate at which they wear away.

Charging and Drawing.—When the retorts are charged by hand the coal is placed in a long semi-circular scoop, having a capacity of about 1½ cwt. of coal. Three men raise the scoop and thrust it into the retort, the man

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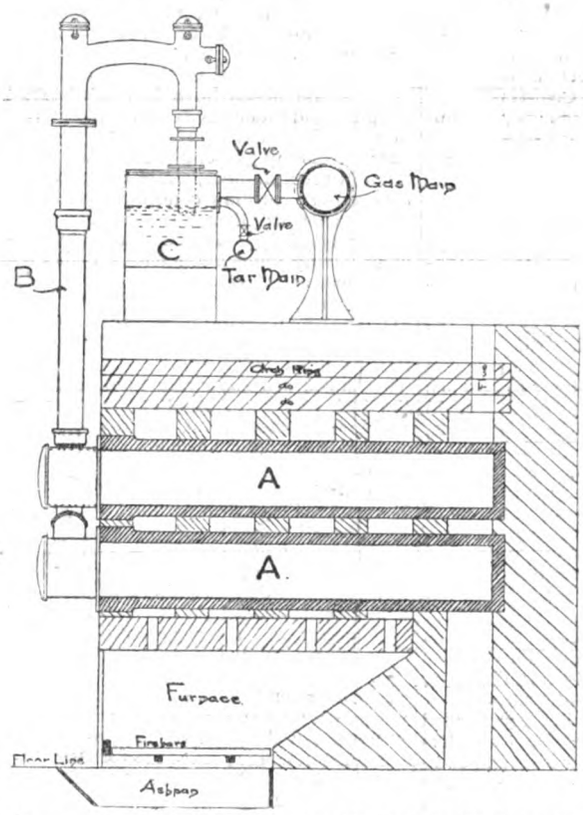

Fig. 1.—Single Retorts; showing (A) *Retorts,* (B) *Ascension Pipes,* (C) *Hydraulic Main.*

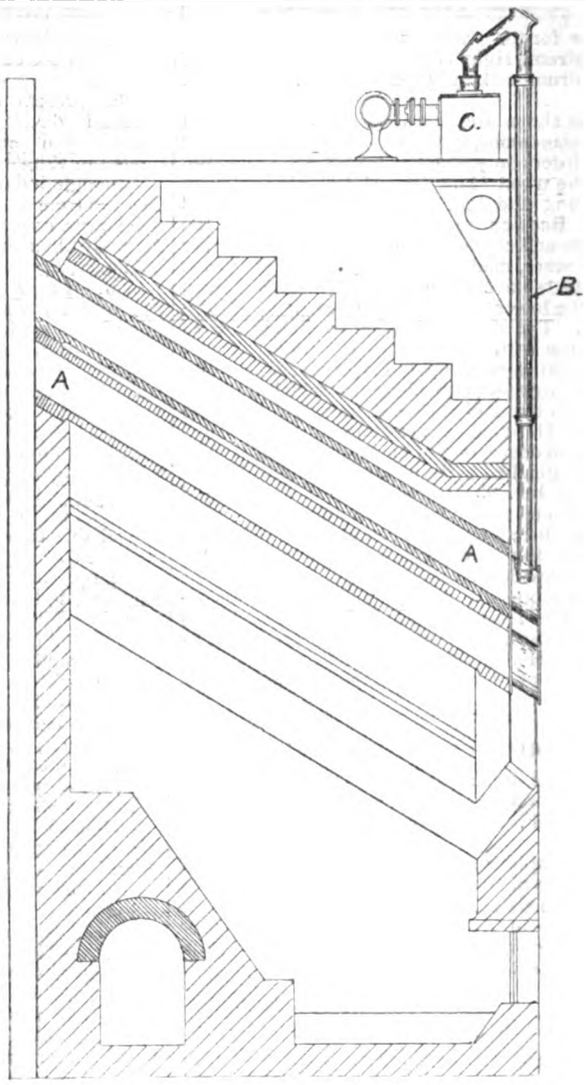

Fig. 3.—Inclined Retorts; showing (A) *Retorts* (B) *Ascension Pipe,* (C) *Hydraulic Main.*

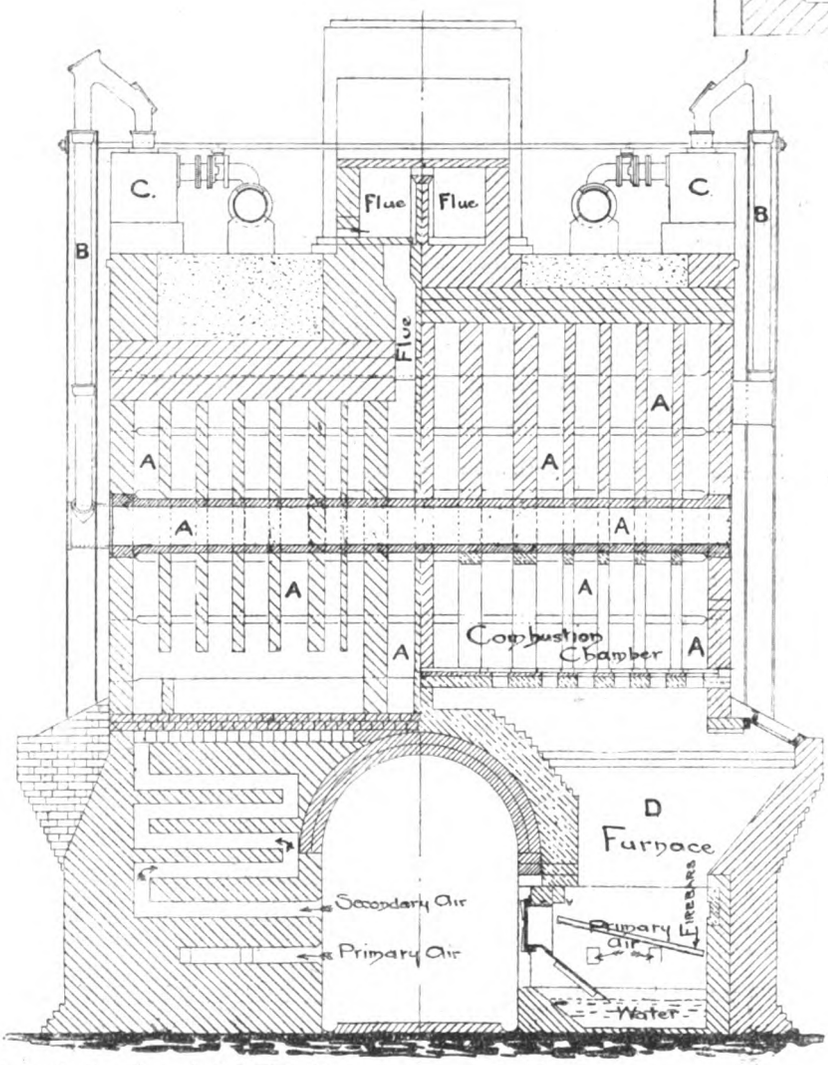

Fig. 2.—Section through Retorts in Regenerative Setting; showing (A) *Retorts,* (B) *Ascension Pipe,* (C) *Hydraulic Main,* (D) *Generator.*

having charge of the handle at the back of the scoop turns the scoop round and then withdraws it. A second scoop-charge is immediately added through the same mouthpiece. If "through" retorts are employed, another gang of men simultaneously charge the opposite end of the retort, for the scoops extend only to one-half the length of the retort. Consequently the charge taken by each "through" retort is about 6 cwt., or 3 cwt. per mouthpiece. Immediately the charging is completed the mouthpieces are closed. After the coal has been in the retort for four, five, or six hours, as the case may be, the mouthpieces are again opened, and the residue in the form of coke is withdrawn by means of a long-handled rake. The red-hot coke is cooled with the aid of water, or is taken in its hot condition to feed the generators. The charging and drawing is now commonly performed by machinery, instead of by manual labour.

Retort Carbon.—Some of the hydrocarbons evolved from the coal under the influence of heat are decomposed before they can escape from the retort, and a hard, dense deposit of carbon, known as "retort carbon" or "scurf," accumulates on the sides of the retorts. The deposit forms less rapidly when there is a slight vacuum in the retorts instead of a slight pressure. By the use of an "exhauster" the gas pressure in the retorts can be maintained approximately at atmospheric pressure, but the variations in the rate at which the gas is expelled from the coal render fluctuations unavoidable. When the deposit has attained a thickness of one or two inches it must be removed, as it lessens the capacity of the retort and diminishes its heat conductivity. It is usually removed with chisel bars at intervals of about six months.

Clinker.—"Clinker" is produced by the partial fusing of the mineral matter left as ash from the fuel upon the heated fire-bricks, a kind of slag being formed. This clinker is extensively used for "rockwork" in ferneries and for garden purposes. The fire-brick rubbish, together with the clinker, is some-

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times pulverised and mixed with sand or sharp grit and used in concrete.

Ascension-pipes.—The gas and vapour expelled from the coal in the retorts passes up a vertical pipe, called an ascension-pipe, which rises from each mouthpiece to a short distance above the retort stack. The ascension-pipes usually have an internal diameter of about 5 in.

Bridge-pipes and Dip-pipes.—The upper end of each ascension-pipe is joined to a short bridge-pipe which extends horizontally back towards the retorts. The other end of each bridge-pipe is connected to a short dip-pipe which extends vertically downwards into the hydraulic main, where it terminates in an open end dipping just below the surface of the liquid in the main.

Hydraulic Main and Foul Main. — The hydraulic main is a pipe not less than 18 ins. in diameter. It may be ⊂-shaped, square, oblong, or round in cross section, and is preferably constructed of mild steel plates. The hydraulic main is frequently supported on standards placed on top of the retort bench. All the dip-pipes along one side of the bed dip into the same main, being sealed by the liquid, which is maintained at a constant level in the main. The gas as it enters the hydraulic main is laden with tarry matter in the form of fine spray, which gives it the appearance of a brown vapour, but the greater portion of the tar condenses out before the gas leaves the main. The tar sinks to the bottom of the main and is covered with an aqueous ammoniacal liquid, which also is condensed from the gas coming from the retorts. Frequently a second large main called the "foul main," which runs the whole length of the retort house, is provided at the back of the hydraulic main, and the gas leaving the hydraulic main passes into the foul main.

OBITUARY.

MR. R. WILSON.—We have to announce the death, on July 1, of Mr. Robert Wilson, architect to the School Board for Edinburgh. After following his profession for a while in London, Mr. Wilson succeeded to his father's practice in his native city. As architect to the Edinburgh School Board he prepared the plans and designs of the following more important board schools:—In Broughton-road, on the site of Blackfield House, 1893, for 1,358 children; in Dalkeith-road, 1895-6; the Industrial School at St. John's Hill, on the site of the old Holyrood Free Church Manse, 1897-8; the enlargement of the North Canongate School for about 750 additional children with central hall, gymnasium, &c., on the site of the old New-street School, 1899-1900; and the Craiglockart Schools at Ashley-terrace, North Merchiston, upon a site of 1¼ acres, having for their main feature central halls upon the ground and first floors, with twenty-seven classrooms, a gymnasium, and a combined workshop and cookery classroom, for 1,590 scholars, for which he completed the plans in April of this year. Mr. Wilson also prepared, in 1898, the plans for the new school buildings, with boardroom and other rooms and offices, together with those for an enlargement of the Anderson Institute School, for the Lerwick School Board, Shetland; the Edinburgh Royal Blind Asylum, No. 50, Nicholson-street, Edinburgh, as just completed; the recent additions to the High School at Portobello; and some business premises in Colson-street, Edinburgh. Mr. Wilson was a prominent member of several philanthropical societies and institutions, Vice-President of the Baptist Union of Scotland, and during a long period was director and organiser of the Edinburgh Free Breakfast Mission.

GENERAL BUILDING NEWS.

WESLEYAN CHURCH, SHEFFIELD.—On the 17th ult. a new Wesleyan church was opened in Sheffield Park district, at the junction of Stafford-road and Fitzwalter-road. The new buildings consist of a church with two vestries, a church parlour, and a school block, with assembly-room and seven classrooms. The church is cruciform in plan, measuring 97 ft. interior extreme length, including chancel, 41 ft. 6 in. wide across the nave, and 59 ft. 6 in. wide across the transepts. It has an end gallery only. There is seating accommodation for 640 adults, or a mixed congregation of 800 persons. At the corner there is a tower terminating with a spire 124 ft. high. The front of the church has three doorways leading to the ground floor and gallery, and the centre doorway has over it a four-light traceried window. The other windows throughout have pointed heads, and the chancel has a circular traceried window which is filled in with stained glass, the gift of the architect. The organ is a three-manual one, and has been built by Messrs. Brindley & Foster. The pulpit is made of alabaster, resting upon polished granite pillars, with a foundation of Caen stone. The school block is built on the central hall plan, with classrooms around it, some of them opening into the hall. The length of the room inside is 50 ft., and it is 29 ft. wide. The classrooms are of varying sizes, there being two large ones for adult classes, and one large one for infants. The rest are of smaller size. Accommodation is provided for 500 scholars. The architect is Mr. John Wills, of Derby and London, and the builder is Mr. James Fidler, of Eckington. The estimated total cost of site, church, and schools is 10,200*l.*

CONGREGATIONAL CHURCH, ENDCLIFFE, SHEFFIELD.—A Congregational school-chapel was opened at Endcliffe, Sheffield, on the 25th ult. The present building consists of a room 48 ft. by 33 ft. On the ground floor are two classrooms, one 19 ft. by 13 ft. and one 13 ft. by 11 ft.; a vestry 13 ft. by 12 ft., which can be used as a classroom; and an infants' schoolroom 24 ft. by 17 ft. On the first-floor are three classrooms, one 16 ft. by 11 ft., and two each 11 ft. by 10 ft. opening on a gallery. These last three rooms, as well as the large classroom on the ground floor, are separated from each other and from the large room by revolving shutters. In the basement are a kitchen, heating chamber, and storeroom. The buildings are of brick, the roofs slated, and the floors are of wood blocks. The following are the contractors: Mason and bricklayer, Mr. H. Turton, Sheffield; joiner, Mr. W. Chandler, Sheffield; slater, Messrs. Pickles Bros., Leeds; plasterers, Messrs. Carter, Unwin, & Sons, Sheffield; plumbers, Messrs. Braithwaite & Co., Sheffield; painters, Messrs. A. Jubb & Son, Sheffield; wood block floors, Mr. Roger Lowe, Bolton. The heating is by hot water on the low-pressure system, and is being carried out by Messrs. Truswell & Son, of Sheffield. The ventilating is by Messrs. Bedford & Co., Halifax. For the purpose of worship, the building will accommodate about 320 on the ground floor, and by utilising the classrooms on the first-floor 100 more can be accommodated. The architects are Messrs. Hemsoll & Paterson, of Sheffield.

WESLEYAN NEW CHURCH, MORTHOE, NORTH DEVON.—At Morthoe, near Ilfracombe, the foundation-stones were laid recently of the new Wesleyan Methodist church. The church is to be built of local stone, the dressings, arches, windows, and door openings being of Bath stone. The nave will be about 54 ft. by 31 ft., and lighted by four windows, east and west, and three side windows in the nave. On the right is to be a transept, divided from the nave by Gothic arches in Bath stone. The seating accommodation of the nave will be for 170 persons, and that of the transept for 70. There is to be a tower about 50 ft. high, with a short pinnacle. The architect is Mr. W. H. Gould and the builders Messrs. Brittons & Pickett, of Ilfracombe.

ST. MICHAEL'S CHURCH, BROMLEY, E.—Messrs. J. E. K. and J. P. Cutts have been appointed architects for the reparation of the fabric of this church, which will cost 2,500*l.* The repairs will comprise the renovation of the roof, renewal of the stonework, cleaning and re-pointing of the brickwork, re-heating, re-glazing, and so on. The church was built in 1864-5, after the plans and designs, we believe, of J. W. Morris.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH.—In our issue of October 22, 1898, we gave a view and plan of this hospital as proposed to be rebuilt at St. John's Wood, from the design and under the superintendence of Mr. E. Goldie. On Monday next the new hospital is to be opened by the Lord Mayor of London and the Lady Mayoress. The original hospital was in Great Ormond-street, adjoining the hospital for sick children; the rebuilding is on a site between Grove End-road and Circus-road. The chapel attached to this hospital in Great Ormond-street, which was erected some thirty-seven years ago at the expense of the late Sir George Bowyer from the designs of the late Mr. George Goldie, has been re-erected at St. John's Wood, the façade being the actual one removed from Great Ormond-street. As much also of the interior of the original structure as could be removed has been re-erected, while the general internal appearance of the original building has been adhered to as far as possible in every particular, including altars and all other fittings. This chapel forms the central feature of the new building. Right and left are two blocks containing respectively, to the west on the ground floor, nearest to the chapel, two sacristies or vestries, beyond which are two isolation wards, *i.e.*, temporary wards for cases to be removed, close by which an exit is provided. Above these are four private wards, while on the floor above are provided one private ward, an operating-room, with additional top-light, and a retiring-room for the patient for the administration of anæsthetics. The corresponding block on the other side of the chapel, comprises on the ground floor pharmacy, boardroom, medical officer's room, a private entrance and with a way up to the latter's sitting-room and bedroom above. The first and second floors are taken up by four private wards on each, with bathrooms, &c. There are thus thirteen private wards in all. Right and left of the chapel are public entrances into the hall, off which is a reception parlour. From this hall at the back of the chapel is the main staircase, in the well of which is a large hydraulic lift, and from which there is communication on the basement, ground floor, and first floor with the adjoining nursing sisters' convent, which is in practice the administration building of the hospital. The two wings parallel to the chapel to the east and west are similar in plan; on the ground, first, and second floors are wards for seventeen beds, each 75 ft. long by 25 ft. 6 in. wide, by 12 ft. 6 in. high. Attached to each are the usual small kitchen, bathrooms, &c., and a staircase from basement to roof, each furnished with a large lift. The building is built of picked stocks. All stonework is Portland. Window quoins, heads, &c., are of red rubbers. Floors and stairs are fire-resisting, laid with teak. Walls and ceilings are finished in Keen's cement, sashes in mahogany. Heating and ventilation are treated as simply as possible, the former supplied by open fires and low-pressure hot water, and the latter by controllable inlets and outlets, the foul-air extract being worked in connexion with the stacks in the centre of wards. The roof, an asphalted flat with a parapet, which can be reached both by stairs and lifts, will be used as a promenade by the patients and nurses. The architect is Mr. E. Goldie, of Kensington, and the contractor Mr. C. J. Hinsley, George-street, Manchester-square, W. The fireproof floors are by Messrs. W. Lindsay & Co., of Westminster; the heating and hot water by Mr. J. Metcalf, Preston; the electric lighting by Mr. J. Sperati, London; and the lifts by Messrs. Waygood & Co., London.

BUSINESS PREMISES, LIVERPOOL.—Messrs. Crane & Sons, Limited, have taken new premises at the junction of Paradise-street with Church-street, and facing Whitechapel, Liverpool. A sum of over 4,000*l.* has been expended on the alteration of the premises, the various works having been carried out by Messrs. Waring & Gillow, Messrs. Haigh & Co., and Messrs. Muir & Cubley, from designs and under the superintendence of Mr. Huon A. Matear.

DISPENSARY, EXMOUTH.—A new dispensary has been erected in Church-street, Exmouth. It contains vestibule, hall, waiting-room, 22 ft. by 15 ft., consulting-room 15 ft. by 14 ft., dressing-room, dark room, dispensary, and caretaker's rooms. The building was designed by Mr. E. Ellis, and built by Mr. J. Lacey.

FIRE STATION, FOREST HILL.—The foundation-stone of a new fire station, to be erected between Forest Hill and Lower Sydenham, was laid by Mr. J. D. Gilbert, the Chairman of the Fire Brigade Committee of the London County Council, on the 4th inst. The new building will occupy a site at the junction of four roads, and, converging on Perry Vale, will be erected under the direction of Mr. W. E. Riley, at a cost of about 11,900*l.*

SAILORS' REST, CARDIFF.—A new Sailors' Rest is to be built at Cardiff at a cost of about 8,000*l.* Separate meeting-rooms will be provided for the different nationalities, and a hall to accommodate 300. In addition there will be a floral hall, in which men may sit and smoke and read. The architects are Messrs. Jones, Richards & Budgen, Cardiff. It is proposed at once to pull down 180 and 179, Bute-street, as the site of the new structure, and the committee have obtained the owner's sanction to call it the "John Cory Sailors' Rest."

MECHANICS' INSTITUTE, FORRES, ELGIN.—The foundation-stone has just been laid of a new façade for the Forres Mechanics' Institute. The new front is designed by Mr. Forrest, architect, Forres, and will, along with some internal alterations, cost about 1,200*l.*

COTTAGE HOSPITAL, SOUTHWOLD.—The foundation-stone has just been laid of a new cottage hospital, Southwold. The new hospital, the plans for which have been prepared by Mr. E. N. Cubitt, architect, of Brentwood, provides for ten beds, there being two large and two small wards, besides kitchen, operating, medical officer's, dispensary matron's, secretary's, nurses', and out-patients rooms. The building, which is to be of red brick and tile, will have a frontage of 80 ft. It is proposed to arrange for flat roofing over the wards, in order that the roofs may be used as a sort of promenade for convalescent patients.

HOSPITAL, ABERGAVENNY. — The foundation-stone has just been laid of buildings for the amalgamated Cottage Hospital and Dispensary Institutions at Abergavenny as a memorial to Queen Victoria. The site is on the Hereford-road, adjoining Bailey Park. The hospital, which will consist of three wards, accommodating seven beds and two cots, the dispensary, and all offices in connexion therewith, will be on the ground floor. Externally the building will be of pressed brickwork, the roof being of Broseley tiles. The contract, amounting to 1,025*l.*, has been let to Messrs. J. G. Thomas & Sons, Abergavenny. The design is by Mr. E. A. Johnson, of Abergavenny and Merthyr.

PARISH HALL, ROUNDHAY, LEEDS.—A new parochial hall has been erected on the Lidgett Park Estate, Roundhay. It is of local stone, and is in the Tudor style. The building is 75 ft. by 30 ft. and 24 ft. in height. The new hall has been designed by Mr. W. Carby Hall, architect, of Leeds.

AGRICULTURAL EDUCATIONAL BUILDINGS, GARFORTH, YORKSHIRE.—New educational buildings have been erected at the Manor Farm, Garforth, by the East and West Ridings Agricultural Council. The buildings are intended to serve a double purpose; in the first place, they contain lecture-rooms and laboratories for students taking the course of instruction given in the Agricultural Department of the Yorkshire College; and secondly, they provide

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a practical dairying school. The buildings, designed by Messrs. Smith & Tweedale, architects, Leeds, have been carried out in red pressed brick, with stone dressings, the roofs being covered with red tiles.

BATHS, PORTOBELLO, EDINBURGH.—New baths have been erected at Portobello at a cost of 29,000*l.*, from plans and under the direction of the City Architect, Mr. Robert Morham. The front of the baths is towards the promenade, the side of the men's swimming pond flanking Melville-street The front entrances for both sections are approached by a flight of stone steps which extend all the length of the central portion of the façade. In the centre of the building on the ground floor is placed the pay-box. To the east of this office is the ladies' entrance, and to the west the gentlemen's. From either entrance a vestibule is reached, divided into two parts by columns and entablature of the Doric order. From the inner vestibule there rises a staircase leading to the upper floors. On the left and right of the men's and women's entrances are the entrances to the plunge or slipper baths. These are arranged on the principle of one bath to two dressing-boxes, with a view to economy in time. In the male side there are six first-class baths, and in the female side four. The baths can be filled either with fresh or with salt water, and the first-class bather will have full control of the feed pipes, as well as being in electrical communication with the attendants. From the entrance hall access is gained to the large pond hall. This hall contains the swimming pond, which has a water area of 75 ft. by 35 ft., the water being 7 ft. deep at one end and 3 ft. 6 in. at the other. The dressing-boxes, to the number of fifty-six, are placed along the sides of the hall. The hall is divided longitudinally by means of ornamental cast-iron columns with moulded capitals. These columns in turn support the gallery and the roof, which terminates in a range of vertical lantern lights. Surrounding the three sides of the pond hall is the gallery, staged and seated for spectators. At the south end of the hall there is provided a gymnasium, 32 ft. by 30 ft. Adjoining the gymnasium, with an independent entrance from Melville-street, an apartment has been set aside for the resuscitation of apparently drowned persons. The women's pond is somewhat similar to the men's, but is not so large, and is restricted to one story in height. One feature at the end of the women's pond is the projecting ornamental oriel, which enables those occupying the reading-room on the first floor to overlook the swimming pond. Situated between the men's and women's ponds are the second-class baths. These are similar to the first-class baths, but are simpler in general treatment. The centre of the south portion of the establishment is occupied by the Turkish bath, accessible from either the men's or the women's side. It consists of two hot rooms, where the temperature will range from 200 deg. to 210 deg.; the sudatorium at a temperature of about 190 deg.; and the tepidarium. Adjoining the sudatorium, but entered by a disconnecting porch, is the shampooing room. A Russian vapour bath also adjoins the sudatorium. Between the sudatorium and tepidarium is the cold plunge bath, 16 ft. long by 5 ft. wide. The tepidarium is fitted up with a series of lounges. On the first floor of the building towards the promenade a series of rooms for the use of visitors has been provided. In the centre portion of the front is a refreshment-room, 38 ft. by 22 ft. This is fitted up with a counter and buffet, and is in connexion with the kitchen in the flat above by means of lifts. Beyond the reading-room at the gentlemen's side is a smoking-room. A feature of the front towards the sea is the balcony on the first floor level, access to which is gained by means of casement windows from the various rooms. The pediment over the men's entrance represents the City Arms, and that over the women's entrance represents the old Portobello Burgh Arms. The building is of Dumfriesshire red stone.

HALLS AND BATHS, KINNING PARK, GLASGOW.—The foundation stones have just been laid of new baths and halls for the burgh of Kinning Park. The plans show buildings involving an expenditure of from 20,000*l.* to 25,000*l.* The halls, which are situated on the north side of West Scotland-street at Smith-street, have a frontage to Smith-street, showing three light Romanesque windows over the main entrance, with minarets on each side, and truncated gable with a niche in which a representation of the Goddess of Harmony is to be placed. The principal entrance is by a flight of steps to a vestibule, which leads through glass doors to a crush hall, 65 ft. by 12 ft. Off the crush hall there are retiring-rooms and the stair leading to the gallery of the large hall. The hall will accommodate 1,200 persons. There will be a separate entrance to the platform from West Scotland-street, which can also be used as an entrance to the lesser halls and library. Behind the platform of the large hall there will be a four manual hydraulic organ. The lesser hall will accommodate between 400 and 500 persons. The baths are being built in West Scotland-street almost opposite the halls. The swimming-pond is 75 ft. by 37 ft., being 6 ft. 9 in. deep at the springboard end and 3 ft. 6 in. at the other. The interior will be lined with white brick, and the floor and passages with Italian mosaic, having panelled borders. Over the swimming-pond there will be a gallery for spectators. Mr. Donald Bruce, of Messrs. Bruce & Hay, Glasgow, is the architect of all the buildings.—*Glasgow Evening Times.*

EXTENSION OF POPLAR HOSPITAL.—The Bishop of London recently opened the new wing, the gift of the Drapers' Company, which has been added to the Poplar Accident Hospital. The addition has been erected at a cost of about 14,000*l.*, and is situated on the eastern side of the surgical ward block of the old building, being an extension of the out-patients' department, and an addition of three medical wards and quarters for the staff. The basement is devoted to the out-patients' department, in which surgical and medical cases are separated, with waiting, examining, and dressing-rooms for each department, the former out-patients' department being converted into a general waiting-room. Upon the ground, first, and second floors are the three wards (41 ft. long by 28 ft. 6 in. wide), for ten medical cases each. The wards are approached through the old surgical wards, but have, in addition, their own staircase and outside escape stairs, with ward scullery, bathroom, sinkroom, and other sanitary accommodation in spurs at the east end, the sisters'-room at the west end, and dayrooms upon the ground and first floors. Each ward has a wide balcony upon the south front, overlooking the docks and river. The floors are laid in ornamental terrazzo mosaic in panels and borders, the walls and ceilings being plastered. The third floor provides accommodation for the nursing staff, and includes a nurses' sitting-room (32 ft. by 12 ft. 6 in.) with square bay, and seven nurses' bedrooms, besides linen storage and the necessary sanitary accommodation. The sitting-room faces the south and south-east. The fourth and fifth floors are occupied by servants' bedrooms and a broad flat for recreation, a portion of which is covered with a shelter roof. The builders are Messrs. Harris & Wardrop, of Limehouse. The architect was Mr Rowland Plumbe, of Fitzroy-square, the architect of the hospital.

BUILDING IN LEEDS.—Property owners and house agents in certain parts of the city are asking whether Leeds is being over-built, many dwellings, including a large number of the cottage class, being at present without tenants. This is so at Armley. An agent in that suburb states that he has on his books no fewer than fifty empty houses, whereas the number in normal times has not been more than twelve. Inquiries of other agents show that there are now four times the number of "to lets" than there were a year or so ago. And it is said that cottages in Armley township are from 6d. to 9d. per week cheaper than similar accommodation in the Roundhay-road and Kirkstall-road districts. In Bramley township the proportion of empties is rather larger than in Armley. A year ago new property in Bramley was let before its completion. Messrs. Yates, Limited, of the Wellington Mills, in Broad-lane, have erected seventy-eight first-class cottages opposite their works, and these have been readily let to their own and other workers. This, it is said, has caused numerous empties amongst poorer-class property. There are at present in Town-street and Back-lane cottages to let which have not remained empty for any length of time during the past fifteen years. At Swinnow empty houses can be seen in many streets. It is expected, however, that the extension of the tramways will have a beneficial effect in the district. In Holbeck new cottage property lets well, but regarding some parts of Hunslet and on the Bank complaints about empty houses are to be heard.—*Leeds Mercury.*

SANITARY AND ENGINEERING NEWS.

BRIGHTON WATER SUPPLY.—The Mile Oak pumping station, in connexion with the Brighton water supply, was recently opened by the Mayor of Brighton. The site for the new pumping station was selected in February, 1896, and in the following April some 290 acres of land, known as Mile Oak Farm, were purchased, and subsequently a further 70 acres of land immediately joining the western boundary of Mile Oak Farm. In May, 1899, the contract for sinking the two pumping wells was let to Mr. A. E. Nunn, of Tenterden, and later, as the progress of the works would allow, further contracts were entered into for the permanent pumping engines, boilers, &c., with Messrs. Fleming & Ferguson, of Paisley; the engine and boiler houses, coal stores, &c., with Messrs. J. Longley & Co., of Crawley; winding shaft and headings, &c., with Mr. A. E. Nunn; and for the erection of the foreman's house, workmen's cottages, and boundary wall with Messrs. R. Cook & Sons, of Crawley. The underground works at the present time comprise two pumping wells, each 187 ft. deep, and joined by two sets of headings, one winding shaft, 6 ft. in diameter and 190 ft. deep, and some 1,200 ft. in length of headings, which vary in height from 30 ft. to 6 ft. 6 in., and are 5 ft. 6 in. wide. The pumping engines are of the marine type, but adapted for this class of work. They are on the triple expansion principle with slide valves and surface condensers, and are each capable of delivering from the bottom of the wells into the centre of Brighton, six miles away, two million gallons of water per day. The maximum speed of the engines is seventy-five revolutions per minute, and they are geared through helical wheels so as to drive the deep well pumps at twenty-five revolutions per minute. There are three Lancashire boilers made of mild steel, each 30 ft. long and 7 ft. 6 in. diameter, and working at a pressure of 140 per square inch, and a Green's economiser, consisting of 120 tubes, each 9 ft. long and 4 9-16th in. in diameter. The engine-room is 78 ft. long by 30 ft. wide and 36 ft. high to the top of the lantern ventilators. Beneath the engine-room is the basement, entrance to which is obtained down a flight of stone steps from the engine-room and also from the front of the building. In this basement the condensers, air pumps, feed pumps, and the various pipes and valves connected with the engines and pumps are situated. On the west of the engine-house is a room furnished and for the use of the members of the Waterworks Committee, and on the east side is the workshop, in which the ordinary repairs of this station will be carried out. The boiler-house is 65 ft. long and 51 ft. wide. The coal store is entirely underground and immediately adjoining (on the west side) the boiler-house. It is 50 ft. long and 50 ft. wide. The chimney-stack is situate to the east of the boiler-house and is 100 ft. in height. Within the boundary wall of the pumping-station, which comprises two acres, are a foreman's house, and immediately to the south of the works two cottages for the use of the workmen employed at the station. The total cost of the pumping station up to the present has been about 50,000*l.* Mr. J. C. May is the Borough Engineer and Surveyor, and Mr. Johnston, C.E., the waterworks engineer.

WIDENING OF QUAY, ABERDEEN.—On the north face of Provost Matthews Quay a new deep-water wharf, 220 ft. long, has just been constructed by the Harbour Commissioners at a cost of 3,100*l.*, according to plans by Mr. R. G. Nicol, Harbour Engineer. The new wharf extends 12 ft. in front of the old one, and is substantially constructed.

NEW WORKS FOR FISHING INDUSTRY ACCOMMODATION, ABERDEEN.—Aberdeen Harbour Commissioners have resolved that instead of going on with the construction of the whole of the wharf on the north side of Point Law and Albert Basin at a cost of 16,350*l.*—as formerly recommended to them—they will proceed with a portion only, 575 ft. in length, the estimated cost being 9,420*l.* It has also been resolved to remove the east end of Point Law and to place a quay wall there, the expense being estimated at 12,000*l.* The plans are by Mr. R. Gordon Nicol, Harbour Engineer.

EXETER WATERWORKS EXTENSION.—Mr. A. A. G. Malet, A.M.I.C.E., held a Local Government Board inquiry at Exeter, on the 4th inst., relative to the application of the City Council for leave to borrow 13,000*l.* for water extension works. The original estimate was 36,000*l.*, but owing to the increased cost of material, increased price of labour, excavation work, and other causes, the cost has run up to 49,000*l.* Mr. Donald Cameron, City Surveyor, explained the details of the scheme and how the increased cost arose

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Robert H. Johnson has been appointed the London agent for the brick and terra cotta department of Henry Dennis, Ruabon (the Ruabon Coal & Coke Co., Ltd.).

HOUSING QUESTION AT WOLVERHAMPTON.—A special meeting of the Wolverhampton Town Council was held on the 1st inst. for the purpose of discussing a report prepared by the Housing of the Working Classes Committee. Alderman L. Johnson, the chairman of the committee, in moving the adoption of the report, said that in the East district there were 228 back-to-back houses, 518 single houses, and 142 through houses, of which 61 per cent. were more or less damp or dilapidated or both. The population of these houses averaged 3·77. With regard to the density of population, he pointed out that, whilst in the cottage tenements proposed to be erected by the committee there would be a maximum number of 225 persons per acre, in the court houses in the whole of the East End there were 384 per acre, in back-to-back houses 392·6, in common lodging-houses (week days) 420·92, ditto (Sundays) 439·74, and in common lodging-houses (registered to accommodate) 648 per acre. The site adopted for the experiment of erecting houses for the poor was 4,000 yards of land in Green-lane, the property of Lord Barnard. The price was 2s. 9d. per square yard, and upon the land it was proposed to erect twenty-five houses of two rooms and twenty-five houses of three rooms at a cost of 4,682*l.* It was expected that the Corporation would be allowed forty years in which to repay the amount expended on the buildings, but if sixty years were allowed it might make it possible to reduce the rents 4d. per week, or give better outside accommodation. The rentals proposed to be charged were 2s. 8d. per week for the two-roomed houses and 3s. 8d. per week for the three-roomed houses. There was no town where the poor were housed in such a way at less rent unless the scheme was subsidised by the rates. Mr. Shepherd seconded the motion, which was carried unanimously.

TENDERS FOR THE NEW MARKET HALL, LEEDS.—At the last meeting of Leeds City Council the Markets Committee recommended the acceptance of tenders for the works required in the erection of

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the new market hall and shops, amounting to 101,329*l.* Alderman Knowles, chairman of the committee, mentioned that Mr. S. Macfarlane, whose tender of 1,701*l.* 5s. 3d. for concretor's work, had been provisionally accepted, had intimated that he had made an error. Under the circumstances he proposed that the tenders should be accepted, with the exception of that for concreting, and that the committee be authorised to accept a tender for that work. This was seconded by Alderman Carter. An amendment was moved by Mr. Peate to the effect that the recommendation of the committee, so far as the acceptance of the tender of Messrs. William Nicholson & Sons, of Leeds, of 20,799*l.* for carpenter's work was concerned, be not approved, but that the letting of the carpenter's work be referred back to the committee for further consideration. He said that in committee the voting rested between Messrs. Nicholson, for whom five voted, and Messrs. James Taylor & Sons, of Yeadon and Guiseley, who received four votes. Messrs. Taylor's tender was for 20,586*l.*, or 212*l.* less than that recommended for acceptance, and he urged that the Corporation were not justified in accepting the higher tender merely on the ground that Messrs. Nicholson were a Leeds firm. Other members of the Council contended that the contract should have been given to Messrs. William Mason & Sons, who were a Leeds firm and whose tender was lower than the other two, namely, 20,541*l.* Eventually the amendment was carried.

NEW BURIAL GROUNDS FOR THE CITY OF WESTMINSTER.—In pursuance of certain provisions contained in the Burial Acts, 1852 to 1885, as amended by the Burial Act, 1900, and in the London Government Act, 1899, an Order in Council has been made for vesting in the Council of the City of Westminster powers to provide requisite places of burial for the inhabitants of the parishes of St. James, St. Martin-in-the-Fields, St. Clement Danes, St. Mary-le-Strand, St. Paul, Covent Garden, the Liberty of the Rolls, the Savoy Precinct, and the Close of the Collegiate Church of St. Peter, Westminster, under the provisions of the Burial Act, 1854. By that statute the Town Council of any borough may petition for an Order in Council for powers to the effect above stated, when all or any of the burial grounds of parishes within, or partly within, the borough have been closed by Order in Council, with the resultant difficulty or inconvenience in providing (under the Burial Act, 1853) requisite places of burial for the resident parishioners.

"PAPRISTEEL" CONDUIT.—The General Electric Company, of Queen Victoria-street, have sent us a leaflet describing their new "papristeel" conduit for electric wires. They rightly say that what is wanted for electric wiring is an inexpensive lightly-insulated conduit. The old method of running the wires in wood casing, while often convenient in wiring old houses, ought never to be used in new houses. The proper time to conceal tubes in the walls and floors is while the house is being built. If purely metallic conduits like gas-barrel, "compo" pipe, or enamelled close-joint conduit are used, then very special precautions have to be taken to prevent moisture condensing inside the tube. The "papristeel" tube is made of steel and is lined inside with a highly insulating paper, which is impervious to damp. It is much cheaper than insulated steel or gas barrel tubes, and affords the same mechanical protection from nails, &c. The various lengths of pipe are "stoved" together, but lengths with screwed joints can be supplied at a slight additional cost. This system has the great advantage, from both the consumer's and the company's point of view, of increasing the insulation resistance of the wiring in the building.

ART EXHIBITION, SHEFFIELD.—The private view of the Summer Exhibition at the Howard Fine Art Gallery, Sheffield, took place on Wednesday, the 10th inst. It includes original drawings and reproductions of Cecil Aldin's work; pictures by Messrs. Dudley Hardy, George Haité, Edward Stott, and other artists, and a series of pictures of Irish scenery by Mr. Owen Bowen.

A BUILDING TRADES' EMPLOYERS' YEAR BOOK.—The "Building Trades' Employers' Federations and Master-Builders' Year-book and Diary for 1901-2" is issued in connexion with the Lancashire, Cheshire, and North Wales Building Trades' Employers' Federation, and is compiled by Mr. R. Hall, builders' surveyor, of Bury. It contains all information as to the trade associations included in this Federation, with copies of forms of contract and sub-contract adopted by the Federation, and various tables of useful statistics for builders.

SPITALFIELDS MARKET.—Lord Harris's Select Committee of the House of Lords have ordered to be reported to the House for third reading the Bill promoted by the London County Council for the purchase of Spitalfields Market from Mr. Horner, the present lessee. Clauses have been inserted in the Bill which will enable the Stepney Borough Council, within whose area the market is situated, to exercise the option within six months after ten years from the passing of the Act to lease or purchase the market and the land. The London County Council are prepared to take steps for purchasing more land around the market and widening the streets. It is stated that the market is let to Mr. Robert Horner upon an eighty-four years' lease from 1882 at a yearly rent of 5,000*l.*, and that the purchase money amounts to 176,750*l.*, together with 1 per cent. for agreed costs of the vendors of the freehold.

NEW ELECTRIC TRAMWAY, ABERDEEN.—The Corporation of Aberdeen has just opened a new electrical tramway from Castle-street to the sea-bathing station. The portion across the Links is on the third-rail principle. The line has received only temporary sanction from the Board of Trade, whose expert has not yet had an opportunity of visiting and inspecting the same, and objections are to be made against a double track in streets so narrow as Justice-street and Park-street.

NATIONAL REGISTRATION OF PLUMBERS, ABERDEEN.—The eleventh annual general meeting of the registered plumbers of Aberdeenshire, Kincardineshire, and Banffshire was held last week in Aberdeen. Professor M. Hay, Medical Officer of Health for the City of Aberdeen and President of the District Council, occupied the chair. It was reported that the registration movement had made a great advance, and that four masters and forty-one journeymen had lately been added to the number of registered men within the district. Allusion was also made in the Council's report to the Birmingham resolution to establish two grades of registration. Dr. Hay was re-elected as president; Mr. A. B. Robertson, plumber, as vice-president; and Mr. C. R. Worling, plumber, as one of the auditors. Other office-bearers were appointed and the vacancies in the District Council filled up.

NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS.—The members of the National Federation of the Building Trade Employers of Great Britain and Ireland took part in several engagements in Glasgow on the 3rd inst., commencing with a reception by the Lord Provost and ex-Bailie Shearer in the morning in the City Chambers, at which they were joined by members of the Institute of Builders. The courtesies of the reception were acknowledged by Mr. King, London, on behalf of the Institute, and Mr. A. Krauss, Bristol, on behalf of the Federation. Subsequently the half-yearly meeting of the Federation was held in the Windsor Hotel, at which several matters affecting the interest of the building trade were discussed, among them being the restrictions imposed by the operatives' trade unions throughout the Kingdom in regard to the fixing of ready-made joinery and worked stone which had been prepared in places other than those in which they were to be fixed. Mr. A. Chambers, Leicester, Mr. Dickinson, Derby, and others gave instances of operatives refusing to fix material which had been prepared in other districts, notwithstanding that the rates of wages in those districts were higher than in the districts in which the material was intended to be used. A resolution was passed expressing the opinion that the restrictions were not only harsh in regard to their application to employers, but hurtful to the general welfare of the trade. The Scottish Federation then entertained the members to lunch, and in the afternoon a supplementary reception was given in the City Chambers by ex-Bailie Shearer; afterwards the company were conducted over the City Chambers by ex-Bailie Shearer, who gave a history of and described the buildings.

THE CARPENTERS' COMPANY'S EXAMINATION.—This Company's annual examination in carpentry and joinery, &c., was held recently at their hall in London Wall. Among the gentlemen who kindly helped the Company by acting as examiners were Professor T. Roger Smith (Master of the Company), Mr. John Slater, Sir Philip Magnus, Mr. Seth Smith (President of the Architectural Association), Mr. Jas. Bartlett, Mr. Barter, of the London School Board, and the President of the Clerks of Works Association. The following is the list of successful candidates, arranged in order of merit:—*First Class.*—1. Jas. Sandham, silver medal; 2. H. T. Barnes, bronze medal; 3. Frank Turner, 4. W. J. Stone, 5. G. W. Filby and F. E. Glover (equal). *Second Class.*—H. O. Armstrong, C. F. Parsons and F. W. Spring (equal), H. Searle, W. G. Pack, E. C. Durnford, F. H. Sharp, H. E. Pack, W. R. Peirce, Wm. Court, W. G. Brookes, W. H. Gardner and R. Pierson (equal).

THE ARCHITECTURAL ASSOCIATION.—Mr. Arthur T. Bolton, A.R.I.B.A., has been appointed Master of the Architectural Association Day School, which will be opened at 56, Great Marlborough-street, W., in October next. There could not be a better appointment.

CAPITAL AND LABOUR.

STRIKE OF PAISLEY MASONS.—About 100 operative masons went on strike on the 2nd inst. at Paisley against the proposal of the masters to reduce their wages by ½d. per hour. The Paisley masters, in intimating the reduction, state that they are only following the lead of Glasgow, which rules the district. It is expected that more Paisley operative masons will strike. Several small employers are, however, continuing at the old rate of 9½d. per hour.

BRADFORD BUILDING TRADES DISPUTE: CORPORATION CONTRACTS.—A deputation from the Bradford Trades and Labour Council waited upon the Finance and General Purposes Committee of the Bradford Corporation on the 4th inst., for the purpose of requesting them to review the decision arrived at some time ago when a deputation of operative masons and joiners met them in connexion with the present dispute in the building trades of the city. On that occasion the deputation called the attention of the Finance Committee to the fact that men were being employed on public works at a reduced rate of wages, works which they contended had been contracted for under the fair contracts clause. They requested that these works should be stopped unless the standard rate of wages were paid. After consideration the Committee arrived at the conclusion that the Corporation could not interfere between contractors who were doing Corporation work and their employees. The matter was reported to the Trades and Labour Council, who then appointed the deputation which waited upon the Committee. The deputation put their case, and afterwards withdrew in order that the members of the Committee might consider what should be done. Alderman F. W. Jowett moved the following resolution:—"That the Council be recommended not to allow any works under any Corporation contracts to proceed except at the standard rate of wages last mutually agreed upon between masters and workmen." A lengthy and heated discussion followed, and Alderman W. Willis Wood (the Deputy-Chairman of the Committee, who presided) declared that the resolution meant that the Corporation were to be called upon to interfere between the employers and employed. Alderman Jowett remarked that that was not a fair way to put the matter, and accused the chairman of showing partiality. The Chairman replied that if he was to be accused of unfairness he would no longer remain in the chair. He thereupon left the room, and several other members of the Council followed him. Mr. J. A. Godwin was then elected to the chair, and eventually the resolution was passed. Before the committee rose the fair contracts clause was considered in its various aspects, but nothing definite with regard to it was decided upon.

SCARBOROUGH BUILDING TRADE DISPUTE.—In January last the operative stonemasons of Scarborough gave six months' notice to the Master Builders' Association for an increase of wages—from 8½d. to 9d. per hour—and alterations in working rules. The Builders' Association, taking into consideration the state of the building trade in the town, decided to offer the operative masons a reduction of ½d. per hour—from 8½d. to 8d. A deputation from the Builders' Association recently met a deputation of the Masons' Society, and after due consideration of the matter came to an amicable settlement. The result is that the wages remain as at present—8½d. per hour—with certain modifications in the working rules.

MASONS' STRIKE, BURTON-ON-TRENT.—At the commencement of the year the journeymen masons of Burton, who are at present in receipt of 8½d. per hour, gave six months' notice for an increase of 1d. per hour, intimating that if it were not conceded they should cease work. Communications have proceeded between the employers and men, but as the former have held out against granting the increase the men have come out on strike.

LEGAL.

DISTRICT SURVEYOR'S SUCCESSFUL APPEAL UNDER THE LONDON BUILDING ACT, 1894.

THE case of Dicksee *v.* Hoskins came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Vaughan Williams and Stirling, on the 8th inst. on the appeal of the District Surveyor from the decision of a Divisional Court of King's Bench consisting of the Lord Chief Justice of England and Mr. Justice Lawrance affirming the decision of a Metropolitan Police magistrate allowing an appeal under the London Building Act, 1894, from a notice of objection to a proposed building served by the District Surveyor, the appellant, upon the respondent, a builder. The proceedings before the Divisional Court were reported in the issue of the *Builder* of May 4 last.

The question to be decided was whether the proposed building came within Section 74 (2) of the Act of 1894. Sub-Section 2 of the section runs as follows:—"In every building exceeding ten squares in area used in part for purposes of trade or manufacture and in part as a dwelling-house, the part used for purposes of trade or manufacture shall be separated from the part used as a dwelling-house by walls and floors constructed of fire-resisting materials, and all passages, staircases, and other means of approach to the parts used as a dwelling-house shall be constructed throughout of fire-resisting materials." The building in question was No. 87, Old Kent-road, and was the re-erection of an old beerhouse called the Horseshoe. It was when erected to exceed ten squares in area, and was intended to contain in the basement beer and wine cellars; on the ground floor a bar, public lobby, saloon-bar, private-bar, parlour, and a public-room; on the first floor a sitting-room, three bedrooms, and a kitchen; and on the top floor attics. The old house was, and the new when created was to be, used for the sale of wine and beer to be consumed on and off the premises. The trade was to be carried on in the basement and ground floor, and the licensee

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and his family were to reside in the upper floors of the building, and the whole of the building was to be covered by the Justices' certificate and Excise licence. The floors separating the ground floor from the first floor and the staircase leading to the first floor were not intended to be constructed of fire-resisting materials, and the magistrate found that if Sub-Section 2 of Section 74 of the Act applied to the building, the provisions of that section would be contravened. He also found, as a fact, that the basement and ground floor of the building were intended to be used for the purposes of the trade of the beerhouse, and that the part above the ground floor was intended to be used as a dwelling-house for the licensed occupier, but held that the case was governed by the decision in "Carritt *v.* Godson," and allowed the appeal, overruling the objection of the District Surveyor. From this decision the District Surveyor appealed to the Divisional Court, when the Lord Chief Justice and Mr. Justice Lawrance held that the Section was intended to apply to buildings part of which were used for trade and manufacture and the other part as a dwelling, and that it was not intended to apply to a building certain rooms of which were used as a dwelling; and the Court therefore dismissed the appeal. Hence the present appeal of the District Surveyor.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, said that, although he did not agree with the findings of fact found by the magistrate, he was bound by them. His Lordship thought that the magistrate had been inconsistent in his finding, and also holding that the case was governed by the decision in "Carritt *v.* Godson." But inasmuch as the Court had to accept the findings of the magistrate, he was of opinion that the appeal must be allowed.

The Lords Justices concurred, and the appeal was accordingly allowed without costs.

Mr. Horace Avory, K.C., and Mr. Rowsell appeared for the appellant (the District Surveyor), and Mr. Danckwerts, K.C., and Mr. Craies for the respondent (the builder).

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

4,599.—APPLIANCES FOR WINDOW-SASHES: *S. Burton.*—In the upper sash is mounted a tapped plate into which is screwed a screw that retains the two sashes when they are closed; in the lower sash is a plate through which the stem of the screw is passed, a second screw is passed through another tapped plate upon the lower sash for engagement with a spring, upon that sash, which becomes pressed outwards as one turns the screw whereby the sashes may be secured at any required height.

4,614.—A METHOD OF DRYING SEWAGE, &C.: *A. Wenck.*—Streams of gas bubbles are impelled through the fluid matter which will then serve for manure. The fluid residues are passed from a reservoir through concentrators and then through another reservoir into a mixing-chamber containing acid and powdered chalk supplied from other reservoirs; as gas is evolved in the fluid it dries the material, and drying-chambers will complete the operation.

4,615.—A PRODUCT FOR USE IN MAKING JAPANS, VARNISHES, &C.: *E. Schaal and M. Schaal.*—The inventors use colophony or resin for making a substance that will have the properties of gum copal or amber; after the colophony has been pulverised and heated, it is exposed to a current of air or oxygen in order to raise its melting point to the degree desired, the resultant product, being of an acid kind, will combine with metallic oxides, or can be formed into ester-like compounds in the same manner as that in which resin is treated.

4,632.—A LIFTING-JACK: *C. Willetts.*—Instead of being cast upon the rising hydraulic cylinder, the foot is screwed on to it and is secured with a key, in order that its relative height may be readily adjusted.

4,646.—INSTRUMENTS FOR USE IN TOPOGRAPHICAL SURVEYING: *A. F. Mockler-Ferryman.*—The invention applies to portable boards with rulers, and to boards for facilitating the drawing of sighting-rays; the board is strapped over the observer's shoulders, and on the underside of the top surface is a metal pivot-plate wherein is cut a key-hole slot for engagement with the neck of a central pivot-pin, near either end of the ruler are two metal eyes through which is threaded a piece of string for sighting purposes.

4,683.—MEANS OF FASTENING BRISTLES IN BRUSH-HANDLES: *L. Roth and M. Israelski.*—The inventors affix the bristle-tufts to the edges of two frames and to crossbars that are hinged or otherwise joined to one of the frames. The stock consists of the frames which will slide into one another, and should be hinged together at their junction with the handles.

4,691.—VALVES FOR WATER-SUPPLY: *H. G. Bedell and F. Welsby.*—The hollow stem of the lift-valve operates over a spindle that is attached to a grating, and has at its top a cup-leather, a spring (which, however, may in another form of the appliance be discarded) being placed between the valve proper and the leather, with a time-screw at the top of the stem which covers the spring; the spring presses the lifted valve on to its seating whilst leakage of water regulates the time; a float-valve that will fall just before the flush has ceased and admit air into the discharge-pipe closes, under normal conditions, the end of an air-pipe.

4,706.—AN ELECTRICAL SWITCH FOR INCANDESCENT LAMP-HOLDERS: *F. Lightfoot.*—Insulating walls that envelope the terminals are fashioned upon the base of the switch; the other two terminals are bridged with a contact-lever, the spring of which will impart a quick break. A slot in the casing provides for the motion of the handle.

4,709.—A JUNCTION-BOX (ELECTRICAL): *G. H. Nisbett.*—The portions of two-part junction-boxes are bolted together when the sheathed cables have been inserted into them. Of the three interior chambers the two at the ends are filled with some elastic material as a setting for the sheathed cable, whilst the middle one takes the coupling; glands are used for closing the openings in the end-chambers and a soldered copper strap for connecting the sheathing to the box.

4,721.—FITTINGS FOR MEASURING RULES: *R. Webster and A. G. Thornton.*—In order that a wire and plate gauge may be combined with the rule the central plate of the hinge has a projection in which the gauge is cut, and the hinge may be graduated so as to serve for a protractor.

4,737.—A CONTRIVANCE FOR PURPOSES OF VENTILATION, &C: *P. Dickinson.*—Flattened elbows are fashioned upon the outer and inner vertical sections of a ventilation or similar pipe so as to terminate near the roof through which the pipe is put, and are joined to a flattened section that constitutes two hinge-joints, with holding-pins, in order that it may rest at 90 deg. with the slope of the roof. The two sub-sections of the connecting-section are bolted together and joined with a wide collar that covers the aperture in the roof; the cap (if any) which covers the ventilation-hole of the collar may be lifted with a screw and an endless cord around a pulley.

4,745.—MEANS OF CLEANSING TUBES AND PIPES: *A. M. Turner.*—A cylinder, of which the two ends are tapered, has a nozzle or connection at one end, and a stop-cock and a connection at the other end. The cleansing material is charged into the cylinder through an opening fitted with a screwed plug, and a portable block is provided with feet that carry the cylinder.

4,788.—A TOOL FOR USE BY PAPER-HANGERS: *T. E. Moffitt.*—As the paper is drawn from a roll, it is passed around guiding rollers and a smoothing roller, and so to the wall or other surface. A split tube, which is joined to a reservoir with feed-pipes fitted with stop-cocks, affords an automatical supply of paste to the back of the paper. Grooves in a rectangular frame carry loosely the ends of a roller, and springs force one of the guiding rollers downwards.

4,812.—A METHOD OF FASTENING FLOOR-BOARDS: *T. Potter.*—For concealing the means whereby floor-boards are secured to wooden joists or to concrete, they are fashioned with grooves which, when the boards have been screwed or nailed in place, are to be filled with strips of wood, the adjacent boards being rebated together. Instead of using the strips, the boards can be glued down. Other modifications are also specified.

4,813.—DANCING-FLOORS: *E. W. Bache.*—By way of limiting the depression of resilient dancing-floors the inventor arranges the springs between the flanges of the cores or stops, which may be either solid or tubular in form of a material that may be either resilient or rigid.

4,825.—TEETH OF CIRCULAR, CROSS-CUT, FRAME, AND OTHER SAWS: *F. M. Wilson.*—Between the ordinary teeth of a saw, and at suitable intervals, other teeth are interposed which are bevelled in opposed directions, for the purpose of scribing the wood whilst the ordinary teeth carry away the sawn material.

4,879.—THEATRICAL STAGE CONSTRUCTION: *B. H. Jacobsen.*—To facilitate the moving of the stage sideways or backwards it is mounted upon wheels that run upon rails. Pivoted arms, which may be folded up against the walls sustain the middle portion of the stage; bevel, worm, or screw gearing moves the wheels vertically, in order that either set of them may be worked, and short rail-pieces are pivoted so that they can be turned in the desired direction at the crossings of the rails which are formed of angle or channel iron, the flanges being cut away at the crossings. For shifting the stage from one set of rails to another set at an angle therewith ordinary turntables can be employed, and a water basin is constructed beneath the stage.

4,924.—A CIRCULAR-SAW GUARD: *J. Bradbury, F. Bradbury, T. Bradbury, and G. E. Bradbury.*—Two pieces, which are adjustably attached to a horizontal bracket with set-screws that work in slots, carry the back and front shields which constitute the guard. Stops upon a transverse horizontal arm, on to the end of which the bracket is pivoted, will hold the bracket in either a vertical position (when access to the saw is required) or in a horizontal position. A pillar at the back of the bench supports the arm, and is to be lifted or lowered by means of a nut and a screw. The various adjustments render the guard available for differently-sized saws.

4,950.—PANELLED WORK: *W. Döderlein.*—The inventor's object is to dispense with the use of glue, to allow for the expansion or contraction of the panels, and to provide means for the passage of air behind the panels so as to prevent dry-rot, warping, and other defects. He constructs a framework with openings in it by halving flanged bars together, on which he lays a veneering-board which is pierced correspondingly with the apertures in the frame, and then he lays solid veneering-boards in the holes against the flanges of the bars. Nailed mouldings hold the solid boards in their places, whilst affording space for contraction or expansion, and a nailed upright moulding covers the joints of the boards, the cornice, brackets, and plinth being secured with nails.

4,993.—FITTINGS FOR WATER-CLOSETS: *M. F. Adams.*—The basin and a slab are formed as one piece. The slab is affixed to the wall, and the force of the flush is increased by the placing of the discharge valve of the flushing cistern in a well which is put low down.

5,009.—A HINGE FOR DOORS AND WINDOWS: *F. C. A. Markwardt.*—In order to facilitate lubrication the socket is fitted over the pin which is affixed to the one plate, and the socket is affixed to the other plate; the stopper of the socket can be removed when the lubricant is to be applied.

5,011.—DOOR-CLOSING APPARATUS: *E. C. Hoffman.*—The spring hinge is intended for holding the door partly opened and for closing it. It comprises a U-spring which a crossbar and a pivot secure to the door, whilst a cam upon the door-frame is pressed by the free end of the spring. As soon as the cam has turned beyond a certain point its periphery becomes concentrical with the hinge-pivot, so that the friction of the spring will thereupon keep the door opened; for raising the door from its hinges a wire is passed through a hole, and will relieve the cam of the pressure of the spring.

5,018-23.—FIRE-PROOF CONSTRUCTION: *New Jersey Wire-Cloth Company.*—The inventions relate to the adoption of grooved fire-proof blocks, sheets of wire-netting or expanded sheet-metal lathing, metallic lathing, transverse metal beams, curved metal rods, flat bars or joists which have notches for engagement with slotted clips on the upper edges of the beams, and concrete filling in the construction of fire-proof ceilings and floors.

5,034.—VALVES FOR WATER-SERVICE PIPES: *W. E. Hinsdale.*—Two nozzles are severally joined to the service and flushing-pipes; of the two pistons a hollow piston-rod of one acts against a spring, and the other serves to control the discharge; at the opening of an auxiliary starting-valve one of the pistons is pressed towards the left side, and so opens the valve, but when the fall of a weighted handle has again closed the starting-valve, the spring slowly returns the piston towards the right side, whilst a time-passage and screw regulate the time of closure. The end of the valve has two cylinders, one of which slides within the other, so that the valve may be adjusted to meet differences of pressure in the supply-pipe.

5,040.—AN ELECTRICITY METER: *A. Wright and Reason Manufacturing Company.*—The inventors provide a registering mechanism which operates through gravity for mercury voltameters. In one form of the appliance a small glass dish, which is affixed on a vertical glass tube, contains a mercury anode. On the upper end of the tube is a pointer, which hangs from a helical spring and traverses a stationary scale. A platinum wire in the glass tube makes electrical connexion with the anode, which is hung within a vessel that holds the electrolyte and a mercury cathode at the bottom. The anode becomes lighter, and the pointer rises, with the flow of the current. Otherwise the movable part of the apparatus may be joined as a cathode, and a conical coil of platinum wire or a porous carbon block may provide the cathode surface, the anode being mercury in an annular trough above the cathode. Various other forms of adaptation are specified.

MEETINGS.

FRIDAY, JULY 12.

British Association of Waterworks Engineers.—Annual general meeting (concluded).

SATURDAY, JULY 13.

Architectural Association.—Visit to Medmenham Abbey, &c., and "Danesfield," Great Marlow, by permission of the architect, Mr. W. H. Romaine-Walker.

Institution of Junior Engineers.—Visit to the Millwall Lead Works. 3 p.m.

WEDNESDAY, JULY 17.

Builders' Foremen and Clerks of Works' Association.—Half-yearly meeting of the members. 8 p.m.

THURSDAY, JULY 18—WEDNESDAY, JULY 24.

British Archæological Association.—Annual Congress, to be held at Newcastle.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 25.—By S. & G. KINGSTON (at Spalding). Deeping St. Nicholas, Lincs.—The Oak Tree Farm, 153 a. 2 r. 28 p., f. £4,450

June 26.—By POWELL & POWELL (at Bath). Monkton Combe, Somerset.—Kingham Farm, 43 a. 1 r. 20 p., f. 1,000

Midford, Somerset.—Two freehold cottages and 0 a. 3 r. 25 p. 260

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Southstoke, Somerset.—A close of arable, 3 a. 2 r. 12 p., f. £110
By H. J. WAY & SON (at Newport).
Newport, Isle of Wight.—Trafalgar-rd., Trafalgar Cottage, f. 545
By M. C. INNOCENT & SON (at Lechlade).
Langford, Oxon.—Short's Farm, 113 a. 0 r. 26 p., part freehold and part long leasehold. 2,475
Butcher's Yard, f. 100
Trevor's House, f. 260
Trevor's Ground, 18 a. 3 r. 14 p., f. 400
Lechlade, Glos.—Jacob's Field, 16 a. 1 r. 26 p., f. 340
June 27.—By J. WEYMOUTH (at Grays).
Stifford, Essex.—Stifford Lodge and 20 a. 2 r. 23 p., f. 3,000
By S. & G. KINGSTON (at Holbeach).
Holbeach Marsh, Lincs.—White House Lodge Farm, 311 a. 3 r. 31 p., f. 15,000
By HENRY HENDRIKS (at Birmingham).
Edgbaston, Warwick.—312, Hagley-rd., u.t. 74 yrs., g.r. 12l. 1,000
Saltley, Warwick. — Pleasant Row - cottages (seven), u.t. 64½ yrs., g.r. 7l. 5s. 610
June 28.—By P. M. PUCKRIDGE (at Swindon).
Chiseldon, Wilts.—The Chiseldon House Estate, 1,048 a. 2 r. 37 p., f. (in numerous lots) 28,081
Lower Wanborough, Wilts.—Horpit Farm, 42 a. 1 r. 33 p., f. 1,000
By GEORGE LOVRITT & SONS (at Coventry).
Coventry, Warwick.—Lockhurst-lane, allotment garden land, 8 a. 0 r. 2 p., f. 700
Lockhurst-lane, two freehold cottages 140
Whilton, Northants.—A freehold farm, 108 a. 0 r. 18 p. 3,400
Braunston, Northants.—The Nelson Inn and two cottages, f. and c., r. 23l. 520
Little Braunston, Northants.—Two freehold cottages 160
Keresley, Warwick.—An enclosure of land, 10 a. 1 r. 34 p., f. 535
June 28.—By Messrs. COBB.
Stodmarsh, &c., Kent.—Stodmarsh Court and 314 a. 1 r. 5 p., f. (including the Manor of Stodmarsh) 4,500
Two freehold cottages 230
The Red Lion p.-h. and 0 a. 1 r. 13 p., f. 600
Chelsea.—1, 2, and 3, Chapel-st., u.t. 48 yrs., g.r. 12l., r. 108l. 1,080
47 and 49, Limerston-st., u.t. 61 yrs., g.r. 8l., r. 84l. 860
40 and 41, World's End Passage, f. 500
Lillie-rd., a plot of freehold land 200
Hammersmith.—27, Ceylon-rd., f. 370
By DOLMAN & PEARCE.
Kentish Town.—19, Islip-st., u.t. 47 yrs., g.r. 6l. 6s., e.r. 48l. 490
Hampstead.—3 and 4, Eton-rd., u.t. 60 yrs., g.r. 24l. 1,325
By EDWIN EVANS.
New Wanstead.—High-rd., Four Oaks, f., e.r. 90l. 1,610
By G. E. LUCK.
Crouch End.—Crescent-rd., Wharncliff Lodge, u.t. 67 yrs., g.r. 16l. 1,875
June 29.—By G. FITT & Co. (at Norwich).
Cantley, Norfolk.—The Grange Estate, 204 a. 0 r. 31 p., f. 3,800
Two enclosures of land, 7 a. 0 r. 18 p., f. 300
Main road, a p.-h. plot, f. 100
Church-road, fourteen building plots, f. 214
By A. J. BURROWS (at Canterbury).
Upstreet, Kent.—Enclosures of land, 1 a. 1 r. 14 p., f. 130
Freehold house and 0 a. 1 r. 9 p. 180
House, shop, and 1 a. 2 r. 33 p., f., r. 20l. 350
House, carpenter's yards, and 0 a. 2 r. 10 p., f. 280
By DEBENHAM, TEWSON, & Co. (at Norwich).
Carlton Colville, Suffolk.—White House Farm, 168 a. 0 r. 22 p., f. and c. 3,800
Enclosures of land, 37 a. 2 r. 26 p., f. 1,925
A freehold grazing marsh, 7 a. 0 r. 7 p. 140
Acle, Norfolk.—Two enclosures of marsh, 22 a. 2 r. 32 p., f. 400
West Dereham, &c., Norfolk.—A freehold and copyhold farm, 150 a. 2 r. 32 p. 1,500
By P. M. PUCKRIDGE (at Chiseldon).
Chiseldon, Wilts.—Freehold houses, cottages, and gardens, lands, &c., about 14 a., f. (in numerous lots) 4,855
By Messrs. BALLS (at Colchester).
White Colne, Essex.—Countess Cross Farm, 106 a. 2 r. 30 p., f. 1,900
July 1.—By BROWETT & TAYLOR.
Peckham.—86, Peckham-rd., with yard in rear, f., r. 80l. 1,200
Anerley.—104, Anerley-pk., u.t. 86 yrs., g.r. 8l., r. 40l. 410
By HARMAN BROS.
Birchington, Kent.—The Birchington Bay Building Estate, 70 a., f. 12,000
Thornton Heath.—41, 43, and 45, Parchmore-rd., f., r. 96l. 1,350
Parchmore-rd., f.g.r. 8l., reversion in 63 yrs. .. 200
Fernham-rd., Fern Cottage, f., e.r. 35l. 650
By J. & W. JOHNSON & Co.
Hackney-rd.—87, 89, and 91, Pritchard's-rd., u.t. 25 yrs., g.r. 20l. 600
By Messrs. KEMSLEY.
Romford, Essex.—London-rd., Holm Lodge and 4 a. 0 r. 5 p., f. 3,500
Woodford.—Churchfields, Talbots, and Corbens, f., r. 110l. 840
Bedford-rd., Fern Villa, f., e.r. 38l. 475
By KING & CHASEMORE.
Wisborough Green, Sussex.—Songhurst Estate, 550 a. 0 r. 32 p., f. 6,000
Pulborough, Sussex.—Old Place Estate, 270 a. 2 r. 16 p., f. (including the manor) 7,000
Enclosure of land, 5 acres, part f. and part residue of term of 10,000 years, r. one penny 330
Langley Torr Meadow, 2 a. 1 r. 29 p., f. 125
By J. C. PLATT.
Shepherd's Bush.—Orchard-rd., a freehold laundry (rear portion of Eton Laundry), r. 186l. 3,450
Landor-rd., the Mozart House and Carlton House Laundries, f., r. 96l. 1,500
1 to 6, Landor-rd., f., r. 156l. 1,395
102, Goldhawk-rd., f., r. 65l. 1,360
Hammersmith.—32 to 38 (even), 44 and 46, Eyot Gardens, u.t. 79½ yrs., g.r. 39l., r. 220l. 2,230
1, 2 and 3, St. Peter's Wharves (Durham Wharf), u.t. 72 yrs., g.r. 30l., r. 215l. £3,050
1 to 28, 30, 32, and 34, Somerset-pl., u.t. 83 yrs., g.r. 87l. 10s. 1,950
By THOMAS WOODS.
Shepperton, Middx.—Main-rd., the Anchor Hotel, f., with goodwill 2,500
New Heston, Middx.—Crawford-rd., Heath View and 1 a. 3 r. 0 p., e.r. 50l. 1,000
By E. G. RIGHTON (at Evesham).
Cleeve Prior, Worcester.—A freehold farm, 140 a. 2 r. 10 p. 2,300
Kemises Farm, 74 a. 1 r. 19 p., f. 1,800
Three freehold meadows, 25 a. 1 r. 10 p. 950
Townsend Close, 2 a. 2 r. 10 p., f. 165
A freehold orchard, 1 a. 0 r. 38 p. 205
A freehold cottage and orchard, 0 a. 2 r. 22 p. .. 180
By THOMAS LAVINGTON (at Swindon).
Broad Town, Wilts.—A freehold cottage and 16 a. 1 r. 22 p. 850
Four enclosures of land, 35 a. 0 r. 27 p., f. 990
Clyffe Pypard, Wilts.—Bashton Farm, 97 a. 3 r. 28 p., f. 2,150
Clyffe Pypard, Wilts.—A tithe rent charge of 435l. 5,250
Calne, Wilts.—Cotton's Close, 2 a. 2 r. 12 p., f. .. 240
By OLIVER & APPLETON (at Skipton).
Appletreewick, Yorks.—Skyreholme Farm, 32 a. 1 r. 35 p., f. 900
Four freehold cottages 170
July 2.—By H. J. BROMLEY.
Norwood.—7, High-st., f., r. 50l. 1,120
By DEBENHAM, TEWSON, & Co.
Regent's Park.—13, Cornwall-ter. and 13, Cornwall-ter.-mews, u.t. 18½ yrs., g.r. 31l. 10s., r. 182l. 1,475
South Kensington.—20, Onslow-sq. and 20, Sydney-mews, u.t. 29 yrs., g.r. 5l., e.r. 180l. 1,950
Shortlands, Kent.—11, Shortlands-grove, u.t. 68½ yrs., g.r. 55l. 500
Peckham.—Choumert-rd., f.g.r.'s 14l., reversion in 43 yrs. 405
Dulwich.—East Dulwich-rd., f.g.r. 10l., reversion in 74 yrs. 250
By G. F. HARRINGTON.
Notting Hill.—23 and 25, Thresher's-pl., u.t. 28½ yrs., g.r. 3l. 280
By G. HEAD & Co.
Pentonville.—Cumming-st., f.g.r. 4l., reversion in 9½ yrs. 330
Pimlico.—95, St. George's-sq., u.t. 36 yrs., g.r. 15l., r. 105l. 900
By HOLCOMBE, BETTS, & WEST.
Shepherd's Bush.—24, 26, and 28, Gayford-rd., f., and part u.t. 77 yrs., g.r. 12l. 625
30, Gayford-rd., f. 305
Notting Hill.—7, 9, and 11, Gadsden-mews, u.t. 65 yrs., g.r. 12l. 250
Portman-sq.—25, Bryanston-st., u.t. 8½ yrs., g.r. 8l. 10s. 320
By OSBORN & MERCER.
Beeston-next-Mileham, Norfolk.—Linford's Farm, 97 a. 3 r. 2 p., f. and c. 1,350
Water Farm, 112 a. 1 r. 28 p., f. and c. 1,100
By REYNOLDS & EASON.
Peckham.—68, Danby-st., f., r. 28l. 455
21 and 44, Moncrieff-st., u.t. 59 yrs., g.r. 9l. 2s. 585
Barnsbury.—65, Thornhill-sq., u.t. 54 yrs., g.r. 7l., r. 60l. 500
By E. & H. LUMLEY.
Whitton, Middx.—Whitton-rd., the Duke of Cambridge b.-h., f., r. 45l. 1,100
Whitton-rd., f.g.r.'s 37l., reversion in 69 yrs. .. 1,024
Petersham, Surrey.—Petersham-rd., Woodbine Cottage and 0 a. 0 r. 29 p., c., r. 40l. 1,410
Gray's Inn-rd.—13 to 18, Sidmouth-mews, f., r. 125l. 2,500
By T. W. GAZE & SONS (at Ipswich).
Holton St. Mary, Suffolk.—The Holton Place Estate, 246 a. 2 r. 26 p., f. 2,950
Fuller's Farm, 4 a. 3 r. 19 p., f. 510
Four freehold cottages 800
Great Wenham, Suffolk.—Acacia Farm, 42 a. 2 r. 17 p., f. 600
By A. J. BURROWS (at Ashford).
Hamstreet, Kent.—The Home Farm, 71 a. 2 r. 15 p., f. 5,500
The Mill Field, 9 a. 1 r. 5 p., f. 370
Bilsington, Kent.—Gurr Field, 31 a. 1 r. 7 p., f. .. 500
By FOX & VERGETTE (on the estate).
Stonea, Cambs.—Hook Enclosures, 17 a. 3 r. 8 p., f. 460
Three enclosures of land, 52 a. 1 r. 27 p., f. 1,160
Forty Acres Field, 43 a. 2 r. 20 p., f. 1,000
A freehold farm, 82 a. 2 r. 0 p. 2,500
By Messrs. BALLS (at Halstead).
Great Maplestead, Essex.—New Barn Farm, 33 a. 2 r. 7 p., f. 500
Lucking House and 102 a. 0 r. 28 p., f. 1,300
Eleven freehold cottages 352
By BOULTON & COOPER (at Malton).
Wold Newton, Yorks.—Wold Newton Farm, 235½ a., f. 5,000
Muston, Yorks.—Muston Cottage Farm, 146¾ a., f. 5,775
By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).
Clapton.—Chatsworth-rd., Clapton Park Tavern, a freehold rental of 50l., reversion in 66¾ yrs. 1,340
Dorking, Surrey.—The Cricketers b.-h. and house adjoining, f., r. 65l. 1,650
Maidenhead, Berks.—High-street, the Bear Hotel, a profit rental of 120l. for 5 yrs. 360
July 3.—By BISLEY & SONS.
Rotherhithe.—11 to 20, Silver-street, u.t. 94 and 95 yrs., g.r. 50l. 1,710
65 to 71 (odd), Galley Wall-rd., u.t. 42½ yrs., g.r. 12l. 1,030
By FOSTER & CRANFIELD.
Enfield.—Clay Hill, Woodbury and 13 a. 2 r. 8 p., f. 7,050
By HUMBERT & FLINT.
Kentish Town.—Kentish Town-rd., f.g.r. 16l. 10s., reversion in 28 yrs. 1,235
Hawley-cres., &c., f.g.r. 5l., reversion in 28 yrs. 2,075
Camden Town.—High-st., &c., f.g.r.'s 21l. and a peppercorn g.r., reversion in 28 yrs. 2,230
Buck-st., &c., peppercorn g.r., reversion in 28 yrs. 245
High-st., &c., f.g.r. 17l., reversion in 28½ yrs... 2,350
Kentish Town.—Kentish Town-rd., f.g.r. 10l., reversion in 29 yrs. 550
Hartland-rd., &c., f.g.r. 13l. 19s., reversion in 37½ yrs. 1,400
Victoria-rd., f.g.r. 3l., reversion in 37½ yrs. £410
Hawley-rd., f.g.r.'s 25l., reversion in 37½ yrs. .. 1,010
By A. PREVOST & SON.
Homerton.—1 to 10, John-st., u.t. 81½ yrs., g.r. 52l. 10s. 580
High Ongar, Essex.—Nine Ashes, Box Cottage, f. 135
By S. WALKER & SON.
Shepherd's Bush.—44 and 46, Loftus-rd., u.t. 63½ yrs., g.r. 8l., r. 67l. 775
1 and 3, Melina-rd., u.t. 52½ yrs., g.r. 12l. 381
19, 21, and 23, Melina-rd., u.t. 52½ yrs., g.r. 18l. 610
By T. NEALE & Son (at Nottingham).
Bulcote, Notts.—Tenterden and 1 a. 0 r. 4 p., f... 2,100
Enclosure of land, 1 a. 0 r. 25 p., f. 250
By HUNT & PEADAR (at Bury St. Edmunds)
Elmswell, Suffolk.—Botany Bay Farm, 33 a. 0 r. 13 p., f. 375
Buggs Farm, 105 a. 0 r. 38 p., f. 710
The Fox Farm, 45 a. 2 r. 0 p., f. 460
By RAWLINS & Co. (on the estate).
Chiswick.—St. Albans-avenue, &c., 293 plots of building land, f. (in lots) 27,019
By Messrs. SPELMAN (at Watton).
Briston, Norfolk.—A small occupation, 10 a. 0 r. 35 p. f. 350
Oak Farm, 43 a. 3 r. 36 p., f. 640
July 4.—By BRIANT & SON.
Brixton.—26 and 28, Nursery-rd., f. 950
Clapham.—56 and 58, Portland-pl. North, u.t. 19 yrs., g.r. 10l. 410
27, 29, and 31, Portland-pl. North, u.t. 19 yrs., g.r. 20l. 610
Peckham.—Hichisson-rd., two plots of land, f. .. 245
Holloway.—119, Seven Sisters-rd., f., r. 105l. 2,500
By DEBENHAM, TEWSON, & Co.
Cheapside.—5, King-st., u.t. 45 yrs., g.r. 120l., e.r. 220l. 510
Mitcham, Surrey.—London-rd., Grove Lodge and 1¾ a., f. 2,150
By HUMBERT & FLINT.
Kentish Town.—Kentish Town-rd., f.g.r. 7l., reversion in 28 yrs. 1,065
Kentish Town-rd., &c., f.g.r. 40l., reversions in 28 to 36 yrs. 3,650
Kentish Town-rd., &c., f.g.r. 18l., reversion in 28 yrs. 1,800
Hawley-rd., f.g.r. 11l., reversion in 35 yrs. 475
Clarence-rd., &c., f.g.r. 23l., reversions in 30 to 37 yrs. 2,820
Castle-pl., &c., f.g.r. 40l., reversion in 33½ yrs... 1,420
Victoria-rd., f.g.r. 11l., reversion in 34½ yrs.... 350
Lewis-st., f.g.r. 36l., reversion in 33½ yrs..... 1,095
Hartland-rd., f.g.r. 8l. 15s., reversion in 37½ yrs. 870
Victoria-rd., &c., a peppercorn g.r., reversion in 30½ yrs. 3,450
Hawley-rd., f.g.r. 3l. 10s., reversion in 37½ yrs. 350
Camden Town.—High-st., &c., f.g.r.'s 12l. and a peppercorn g.r., reversion in 28 yrs. 1,075
Camberley, Surrey.—The Heathermount Estate, 29 a., f. 3,750
By C. C. & T. MOORE.
Bermondsey.—1 to 11, Albion-pl., u.t. 8½ yrs., g.r. 75l. 16s. 210
Poplar.—105, Crisp-st., u.t. 49½ yrs., g.r. 5l., r. 45l. 600
96 to 108 (even), Hind-st., u.t. 47 yrs., g.r. 21l. 1,520
Hackney.—62, 64, and 66, Gt. Cambridge-st., u.t. 20 yrs., g.r. 10l. 10s., r. 85l. 2s. 455
17 and 19, Brunswick-st., u.t. 33½ yrs., g.r. 4l. 10s. 360
Poplar.—108, 108A, and 110, West India Dock-rd., f., r. 108l. 1,680
East Ham.—85 and 87, Barking-rd., f., r. 80l. 1,380
Leyton.—244, 246, 248, and 252, High-rd., f., r. 165l. 3,250
Stratford.—109 to 119 (odd), Chandos-rd., f. 1,400
146, Major-rd. (Leyton Stores), f., r. 40l. 1,270
By NEWBON, EDWARDS, & SHEPHARD.
Hackney.—25, Cassland-cres., u.t. 44 yrs., g.r. 6l. 6s., e.r. 50l. 425
17, Gt. Cambridge-st., f., r. 39l. 340
Barnsbury.—177, Barnsbury-rd., f., r. 45l. 600
Islington.—331, Liverpool-rd., u.t. 7¼ yrs., g.r. 12l. 12s., r. 52l. 115
21, Cross-st., c., r. 55l. 770
Highbury.—25, Highbury-gr., u.t. 41 yrs., g.r. 30l., e.r. 90l. 640
Canonbury.—7 and 9, Canonbury-rd., u.t. 17 yrs., g.r. 12l., r. 84l. 410
Woodford.—1 and 2, Sherborne-villas, f., r. 56l. .. 720
Westminster.—85, Vincent-sq., u.t. 12 yrs., g.r. 55l., r. 130l. 120
By NOTT, CARTWRIGHT, & ETCHES.
Pimlico.—8, Sutherland-st., u.t. 32 yrs., g.r. 9l., r. 60l. 440
71, Cumberland-st., u.t. 32 yrs., g.r. 6l., e.r. 55l. 350
77, Westmoreland-st., u.t. 28 yrs., g.r. 16l. 325
Tilbury, Essex.—Christchurch-rd., &c., eighteen plots of building land, f. 165
By W. STEVENS.
St. Pancras.—Burton-cres., i.g.r.'s 220l. 10s., u.t. 53 yrs., g.r. 7l. 480
North Crescent-mews, i.g.r.'s 50l. 8s., u.t. 53 yrs., g.r. 5l. 110
Shoreditch.—56 to 74 (even), Fellows-st., u.t. 12½ yrs., g.r. 35l. 805
Haggerston.—46 and 48, Acton-st., u.t. 17½ yrs., g.r. nil. 340
By STIMSON & SONS.
City of London.—7, Cheapside, beneficial lease for 9½ yrs., r. 525l. 360
Tottenham.—55, Broad-lane, u.t. 77 yrs., g.r. 9l., r. 30l. 200
65, 67, and 69, Broad-lane, u.t. 77 yrs., g.r. 27l., r. 86l. 12s. 600
Finchley.—19 and 21, Dollis-rd., u.t. 75 yrs., g.r. 13l., r. 38l. 400
Plumstead, Kent.—154, Sandy Hill-rd., u.t. 9 yrs., g.r. 1l. 15s., r. 40l. 100
Catford.—90, 92, and 94, Barmeston-rd., u.t. 76 yrs., g.r. 18l. 15s. 410
Beckenham, Kent.—1 and 6, Hartington-villas, f., r. 67l. 800
Streatham.—26 and 32, Fairmile-av., u.t. 80½ yrs., g.r. 17l. 5s., r. 98l. 950
Brixton.—33, Knowle-rd., u.t. 61 yrs., g.r. 5l. 10s., e.r. 36l. 370
Battersea.—64, Mysore-rd., u.t. 89 yrs., g.r. 7l. 7s., r. 38l. 390
Aldershot, Hants.—Waterloo Villas, f.g.r. 20l., reversion in 61 yrs. 460

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Reconstruction of Mews Bridge	Southampton Corporation	County Surveyor, The Castle, Winchester	July 13
Retaining Wall, &c., Frank-street	Bury (Lancs) Corporation	A. W. Bradley, Civil Engineer, Bank-street, Bury	July 16
Additions to Schools	Gulval (Cornwall) School Board	T. H. Cornish, 8, Parade street, Penzance	do.
Residence, Burley, Yorks		H. & E. Marten, 25, Cheapside, Bradford	do.
Service Reservoir	Bury (Lancs) Water Board	J. Cartwright, Engineer, Market-place, Bury	do.
Water Mains, Glenfield-road	Dover Town Council	H. E. Stilgoe, Civil Engineer, Town Hall, Dover	do.
Additions to School, Feversham-street	Bradford School Board	Mawson & Hudson, Architects, The Exchange, Bradford	do.
Lodge, &c., Victoria Park, Plymouth		A. W. Debnam, Architect, Town Hall, East Stonehouse	July 17
Additions to Gasworks	Atherton (Lancs) U.D.C.	Newbigging & Son, Engineers, 5, Norfolk-street, Manchester	do.
Alterations, &c., to Museum	Canterbury Corporation	A. C. Turley, Civil Engineer, Tudor Chambers, Canterbury	do.
Four Houses, &c., Gelligaer, Wales		G. Kenshole, Architect, Station-road, Bargoed	July 18
Baths	Atherton (Lancs) U.D.C.	F. H. Grimshaw, Civil Engineer, Atherton	do.
Building Work at Asylum, Chartham Downs	Kent County Asylum	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	July 19
Four Houses, Thornhill-road, Dewsbury	Dewsbury Pioneer Indus. Soc., Ld.	Holtom & Fox, Architects, Corporation-street, Dewsbury	do.
House, Distington, Cumberland	Mr. C. Clarke	T. Wilson, Flower Hill, Distington	do.
Rebuilding Bridge, Bradbury	Durham County Council	W. Crozier, Civil Engineer, Shire Hall, Durham	do.
Waterworks, Charndon	Buckingham R.D.C.	G. Roberts, Engineer, Deanshanger, Stony Stratford	do.
Alterations to Invergyle House, Stronachlachar	Glasgow Corporation	J. M. Gale, Engineer, 45, John-street, Glasgow	July 20
Completing Church, Kilkenny		W. H. Byrne, Architect, 22, Suffolk-street, Dublin	do.
Sanitary Appliances, &c., at Infirmary, Cardiff		E. Seward, Architect, Cardiff	do.
House, Crumlin, Mon.		R. L. Roberts, Architect, Abercarn	do.
Extensions to Central Station, Glasgow	Caledonian Railway Company	J. Blackbun, 302, Buchanan-street, Glasgow	do.
Police Station, Woolston, Hants		W. J. Taylor, Surveyor, The Castle, Winchester	do.
Extension of Electricity Works	Blackburn Corporation	A. S. Giles, Engineer, Jubilee-street, Blackburn	July 22
Granite Road Metal	Stevenage U.D.C.	W. O. Times, Council Offices, Stevenage	do.
Brass Foundry, &c., Tinsley	Sheffield Corporation	C. F. Wike, Civil Engineer, Town Hall, Sheffield	do.
Water Tower, Southall, Middlesex	South-West Suburban Water Co.	R. St. G. Moore, Civil Engineer, 17, Victoria-street, S.W.	do.
*Widening Croydon-road	Beckenham U.D.C.	Surveyor, Council Offices, Beckenham	do.
*Underground Convenience	West Ham Borough Council	Town Hall, West Ham, E.	July 23
School and Offices, Bradway	Norton School Board	S. Allen, 20, Bank-street, Sheffield	do.
Pumping Station, &c., Hardwick	Wellingborough U.D.C.	E. Sharman, Surveyor, Market-square, Wellingborough	do.
*Works, &c.	St. Olave's Guardians	Newman & Newman, 31, Tooley-street, S.E.	July 25
*Warehouse	Midland Railway	See Advertisement	do.
*Nurses' Home, &c.	Chester County Asylum	County Architect, Newgate-street, Chester	Aug. 1
*Sewers	Stroud R.D.C.	Council Offices, John-street, Stroud	do.
*Cottages	Hereford Town Council	City Surveyor, Mansion House, Hereford	do.
*Electric Tram Car Sheds	Sunderland Corporation	Barnes & Coates, 41, Fawcett-street, Sunderland	Aug. 2
*Offices, &c.	Birkenhead Union	See Advertisement	Aug. 3
*Library, &c.	Isle of Wight County Council	See Advertisement	Aug. 5
Concrete Water Tank, Glencaple, near Dumfries		A. Laird, Civil Engineer, 190, West George-street, Glasgow	No date
Making Up Several Streets	Hornsea U.D.C.	P. Gaskell, Civil Engineer, Surveyor, Hull	do.
Additions to Albion Schools, Nottingham		H. Allcock, Architect, Bentnick-buildings, Nottingham	do.
Club and Room, Holme, Clwiger, near Burnley		J. C. Wilson, 168, Todmorden-road, Burnley	do.
House and Shop, Walk Mill, near Burnley		do.	do.
Business Premises, Colchester	Messrs. Blomfield & Co.	Goodey & Cressall, Architects, Victoria-chambers, Colchester	do.
Sewerage Works, &c., near Buxton	Fairfield U.D.C.	C. Flint, Surveyor, Queen's-road, Fairfield	do.
Roof Works, Exeter	Messrs. Bodley, Bros. & Co.	J. A. Lucas, Architect, High-street, Exeter	do.
Two Houses, Arlington-street, Wakefield		W. Wrigley, Architet, 6, Westgate, Wakefield	do.
Alterations to Business Premises, Consett		Geo. Balls, South Shields	do.
Cottage, Edgefields Estate, Stockton	Mr. W. Heath	W. H. Walley, Architect, Queen-street, Buralem	do.
*Alterations, &c., to School	Watford School Board	C. P. Ayres, Burvale, Watford	do.
*Offices	Prudential Assurance Co., Ltd.		do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Worksop Union	3*l.* 3s. per week	July 16

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. —.* *Contracts, pp. iv. vi. viii. x. & xxii.* *Public Appointments, pp. xix. & xxii.*

Holloway.—Moray-rd., f.g.r.'s 12*l.* 12s., reversion in 64 yrs. £310
Canning Town.—Victoria Dock-rd., f.g.r. 8*l.*, reversion in 56 yrs. 250

By WETHERHALL & SONS.

Odiham, Hants. — The Well House Estate, 274 a. 2 r. 33 p., f. and c. 3,500

By SPRING & SON (at Brigg).

Kirton-in-Lindsey, Lincs.—Mount Pleasant Farm, 317 a., f. and c. 9,000

July 5.—By GEORGE BILLINGS.

Tottenham.—52 to 57, Love-lane, and 1 to 6, Vine Cottages, f. 1,950
Canning Town.—8, 10, and 12, Wightman-st., u.t. 99 yrs., g.r. 15*l.* 600

By Messrs. CRONK.

Sevenoaks, Kent.—The Vine, Belle Vue, f. 850

By DUNN, SOMAN, & COVERDALE.

Great Warley, Essex.—Fairstead and 7 a., f. .. 4 000
Commercial-rd.—No. 666, f.g.r. 5*l.* 18s. 6d., reversion in 3 yrs. 1,200
Commercial-rd.—No. 672, and the Duke of York b.-h., f.g.r. 7*l.* 18s., reversion in 3½ yrs. 1,600
West Smithfield.—3, Cloth Fair, f., r. 52*l.* 10s. 925
Leyton.—Tyndall-rd., f.g.r. 10*l.*, reversion in 81 yrs. 230
Walthamstow.—King-st., f.g.r. 24*l.*, reversion in 81 yrs. 505
Fulham.—Langford-rd., f.g.r.'s 114*l.* 18s., reversion in 82½ yrs. 2,650
Sandilands-rd., f.g.r.'s 44*l.* 8s., reversion in 81 yrs. 1,000
Woodford.—Grove Hill-rd., f.g.r.'s 21*l.*, reversion in 83 yrs. 500
Upton Park.—Plashet-lane, f.g.r.'s 12*l.* 12s., reversion in 82 yrs. 295

By ALFRED PREECE.

Camberwell.—407, Albany-rd., f., r. 42*l.* 600
105, East-st., f., r. 47*l.* 700
238 and 240, Beresford-st., u.t. 49 yrs., g.r. 8*l.* 630
Dalston.—77, Forest-rd., u.t. 12 yrs., g.r. 6*l.* 6s., r. 32*l.* £200

By LINNETT & LANE.

Hornsey Rise.—1, Duncombe-rd., u.t. 60 yrs, g.r. 7*l.*, e.r. 65*l.* 660

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.		
Hard Stocks	1	14	0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1	11	0	,,	,, ,,
Facing Stocks	2	12	0	,,	,, ,,
Shippers	2	8	0	,,	,, ,,
Flettons	1	8	6	,,	,, ,,
Red Wire Cuts	1	14	6	,,	at railway depot
Best Fareham Red	3	11	0	,,	,, ,,
Best Red pressed Ruabon Facing	5	5	0	,,	,, ,,
Best Blue Pressed Staffordshire	4	4	0	,,	,, ,,
Do., Bullnose	4	9	0	,,	,, ,,
Best Stourbridge Fire Bricks	4	2	6	,,	,, ,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.		
GLAZED BRICKS.					
Best White and Ivory Glazed Stretchers	13	0	0	per 1,000	at railway depôt
Headers	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	17	0	0	,,	,, ,,
Double Stretchers	19	0	0	,,	,, ,,
Double Headers	16	0	0	,,	,, ,,
One Side and two Ends	19	0	0	,,	,, ,,
Two Sides and one End	20	0	0	,,	,, ,,
Splays, Chamfered, Squints	20	0	0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	14	0	0	,,	,, ,,
Double Stretchers	15	0	0	,,	,, ,,
Double Headers	14	0	0	,,	,, ,,
One Side and two Ends	15	0	0	,,	,, ,,
Two Sides and one End	15	0	0	,,	,, ,,
plays, Chamfered, Squints	14	0	0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	,, ,,
Best Portland Cement	35	0	per ton, delivered.
Best Ground Blue Lias Lime	25	6	,, ,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt

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PRICES CURRENT (*Continued*).

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath "	1 7	" "
Farleigh Down Bath ..	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks..	2 1½	" "
Red Corsehill "	2 5	" "
Red Mansfield "	2 4½	" "
Hard York in blocks ..	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	s. d. 2 8	per ft. super. at rly. depôt
" " 6 in. Rubbed Ditto..	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" " 2 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.
" " " 6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
" " " 3-in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor ..	11 5 0	per 1000 of 1500 at ry. dep.
" best seconds "	10 15 0	" "
16× 8 best "	6 8 6	" "
20×10 best blue Portmadoc	10 18 0	" "
16× 8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green.....	11 8 6	" "
16× 8 " "	6 15 0	" "
20×10 Permanent green	10 0 0	" "
16× 8 " "	5 18 6	" "

TILES.

	s. d.	
Best plain red roofing tiles ..	42 6	per 1,000 at rly. depôt.
Hip and valley tiles ..	3 7	per doz. " "
Best Broseley tiles	45 6	per 1,000 " "
Hip and valley tiles ..	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. ornamental Do. ..	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" " "
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.....	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0 " " "	
2 in. by 4 in. and 2 in. by 6 in. ..	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	more than battens.
	At per load of 50 ft.	
Fir timber: Best middling Dansig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks.....	2 15 0	3 0 0
Pitch pine timber (35 ft. average)..	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.....	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	19 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
3 in. by 9 in.	19 0 0	20 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 0 0	16 0 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens.....	14 20 0	15 10 0
Second yellow deals, 3 in. by 11 in.....	16 10 0	17 10 0
Do. 3 in. by 9 in.	15 0 0	16 0 0
Battens.....	12 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.....	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens.....	11 10 0	12 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in..	15 0 0	16 0 0
" " 3 in. by 9 in. ..	14 0 0	15 0 0
Battens.....	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
" " 3 in. by 9 in.	13 0 0	14 0 0
" " battens	10 12 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine— First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0.	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine— Planks, per ft. cube	0 3 6	0 4 6
Dansig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do. —	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch.....	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6
	Per square	
Prepared Flooring— 1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.

	In London, £ s. d.	or delivered to Railway Vans, per ton. £ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	8 0 0
Compound Girders " "	9 0 0	10 5 0
Angles, Tees and Channels, ordinary sections	8 17 6	10 17 6
Flitch Plates	9 0 0	9 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.— Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 15 0
" galvanised	16 0 0	- - -
" (* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.....	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.— Ordinary sizes to 20 g.....	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.....	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in..... (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	15 5 0	- - -
Pipe in coils	15 15 0	- - -
Soil Pipe..	18 5 0	- - -
ZINC—Sheet— Vieille Montagne ..... ton	24 0 0	- - -
Silesian.....	23 10 0	- - -
COPPER— Strong Sheet..... per lb.	0 1 0½	- - -
Thin ..... "	0 1 2	- - -
Copper nails ..... "	0 1 2	- - -
BRASS— Strong Sheet..... "	0 0 11	- - -
Thin ..... "	0 1 1	- - -
TIN—English Ingots ..... "	0 1 5	- - -
SOLDER—Plumbers' ..... "	0 0 7	- - -
Tinmen's ..... "	0 0 8	- - -
Blowpipe ..... "	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster.....	30 0	per ton delivered.
Fine "	38 0	" "
Coarse Keenes and Parian cement	51 6	" "
Fine do. do.	59 6	" "
Robinson's Fireproof Cement..	51 6	" "
Do. Finishing " .. (Exclusive of the ordinary charge for sacks.)	36 6	" "
Whiting.....	30 0	" "

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d. per ft. delivered.
" " fourths	2½d. " "
21 oz. thirds	3½d. " "
" " fourths.....	3½d. " "
26 oz. thirds	5d. " "
" " fourths	4½d. " "
32 oz. thirds	6d. " "
" " fourths	5½d. " "
Fluted sheet, 15 oz.	3½d. " "
" " 21 "	4½d. " "
½ Hartley's Rolled Plate.....	3d. " "
⅝ " " "	3½d. " "
⅞ " " "	4d. " "

PRICES CURRENT (*Continued*).

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes.....	0 2 10	per gallon
" " " in barrels	0 2 11	"
" " " in drums	0 3 1	"
Boiled " " in pipes.....	0 3 0	"
" " " in barrels	0 3 1	"
" " " in drums	0 3 3	"
Turpentine, in barrels	0 2 4	"
" in drums.....	0 2 6	"
Genuine Ground English White Lead ...per ton	23 0 0	
Red Lead, Dry..... "	24 0 0	
Best Linseed Oil Putty.....per cwt.	0 9 0	
Stockholm Tar ..... per barrel	1 10 0	

VARNISHES, &c.

	per gallon £ s. d.
Fine Elastic Copal Varnish for outside work —	0 16 6
Best Elastic Copal Varnish for outside work —	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work.....	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work...	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BALLYNATRAY (Ireland).—For building and other improvements to Ballynatray House, for Colonel Hilroyd Smith. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—

Murray & Son, Joughal, co. Cork* £675

BARKING.—For alterations and additions to the Stag Beer House, Ripple-road, Barking, for Mr. T. W. Glenny, The Brewery, Barking. Mr. Theodore Gregg, architect, 1A, St. Helen's-place, E.C.:—

Barrett & Power	£875	G. L. Kirby, Holloway*	£753
J. Bentley	765		

CHESHUNT.—For the erection of three shops and dwellings, Goffs Oak, Cheshunt, Herts, for Mr. A. W. Birt. Mr. John Parrish, architect and surveyor, Clapton Park, N.:—

Lawrence & Sons	£1,449	Edwards	£1,350
Knight Bros.	1,371	Jennings & Grenfell*	1,295

COLCHESTER.—For the erection of a Freemasons' Hall in Abbeygate-street, Colchester, for the Trustees. Mr. Chas. E. Butcher, architect, 3, Queen-street:—

Harris & Rome	£2,494	W. Chambers	£2,189
J. Grimes	2,400	G. Dobson & Son ..	2,180
A. E. Diss	2,300	T. J. Ward	2,165
R. Myall	2,279	R. Beanmont	2,117
A. Diss	2,250	J. McKay	2,095
F. Dupont & Co. ..	2,247	Everett & Son, Colchester	2,050
E. West	2,229		

DAGENHAM. — For alterations to the Chequers public-house, Rainham-road, Dagenham, for Mr. T. W. Glenny, The Brewery, Barking. Mr. Theodore Gregg, architect, 1A, St. Helen's-place:—

G. L. Kirby	£367 0	Millbon & Brothers, Romford*	£279 12
Goodall & Son	364 0		
Barrett & Power ..	343 0		

HOLT (Norfolk). — For the erection of the new Gresham's School and headmaster's house, for the Governors. Mr. Howard Chatfeild Clarke, architect, 63, Bishopsgate-street Within, London, E.C.:—

Hall, Beddall, & Co.	£53,443	Parnell & Son	£48,657
Lawrance & Sons ..	51,577	F. S. Halliday ..	48,327
Cornish & Gaymer..	51,557	G. Riches, Cromer†	45,980
Colls & Sons	51,223		

† Modified and accepted.

KILANACRENAN.—For addition, including plumbing and sanitary arrangements to, dwelling-house, Kilanacrenan, for Mr. Neil Coyle, J.P. Mr. J. McIntyre, architect, Letter Kenny:—

W. Wilson	£171 0 0	W. J. Mooney, Bishop S. Derry	£129 10
D. M. Caffrey..	157 3 10		

[See also next page.

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KIRKCALDY.—For the erection of tenements in Harriet-street, Sinclairtown, for Mr. Colin Cummings. Mr. D. Forbes Smith, architect, Kirkcaldy :—

Masonry.
Henry Masterton, Sinclairtown* £775 0
Joinery.
David Wishart, Pathhead* 582 0
Plastering.
Henry Masterton, Sinclairtown* 250 0
Plumbing.
Andrew Kirk, Pathhead* 117 15
Slating.
David Johnston, Dysart* 54 0
Total £1,778 15

KIRKCALDY.—For the erection of shops and dwelling-houses in Commercial-street, Pathhead, for Mr. Alex. Lees. Mr. D. Forbes Smith, architect. Quantities by the architect :—

Masonry.
D. Wilkie, Sinclairtown* £179 13 0
Joinery.
A. Carmichael, Pathhead* 209 17 6
Plumbing.
A. Kirk, Pathhead* 27 15 0
Slating.
R. Page, Pathhead* 15 0 0
Plasterer.
A. Hutchison, Sinclairtown* 29 8 0
Total £461 13 6

LONDON.—For repairs at the Duke of York, Hoxton, N. Messrs. C. Foulsham & Herbert Riches, architects, 3, Crooked-lane, King William-street, E.C., and Bromley-by-Bow, E. :—

Courtney & Fairbairn	£625	Osborn & Sons*	£437
Sheffield Bros.	485		

LONDON.—For repairs at the Unicorn, Notting Hill, W. Messrs. C. Foulsham & Herbert Riches, architects, 3, Crooked-lane, King William-street, E.C., and Bromley-by-Bow, E. :—

J. T. Robey	£213	A. W. Derby*	£178
Osborn & Sons	204		

LONDON.—For the erection of shops and flats at Lower Clapton, N.E. Mr. Herbert Riches, architect and surveyor, 3, Crooked-lane, King William-street, London, E.C. Quantities supplied :—

Holt & Sons	£15,098	Todd & Newman	£13,333
A. Porter	14,845	Green & Smith	13,280
S. J. Scott	14,073	Fred. & T. Thorne	13,000
Grover & Son	13,650	Sheffield Bros.*	12,993
Courtney & Fairbairn	13,525		

[All estimates are exclusive of smith's, plumber's, hot water and sanitary engineer's, and bell-hanger's works, stoves, &c.]

LONDON.—For repairs to off-licence premises, Old Ford, E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C. :—
Sheffield Bros.* £185

LONDON.—For alterations, No. 369, Wandsworth-road. Mr. H. Bignold, architect :—
W. Heather* £420

LONDON.—For two blocks of maisonettes, Bolingbroke-grove, Wandsworth. Mr. H. Bignold, architect, Lavender-hill, S.W. :—
W. Ward* £60

LONDON. — For seven houses. Barmouth-road, Wandsworth. Mr. Herbert Bignold, architect, 242, Lavender Hill, S.W. :—
F. Jenkins* £3,700

LONDON.—For the manufacture, delivery, and erection of new steam, feed, and other piping required in connexion with the new high-pressure boilers that are being erected at the Western pumping-station for the London County Council :—

John Cochrane	£3,400	Sir Hiram Maxim Electrical and Engineering Co., Ltd.	£2,888
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Babcock & Wilcox, Ltd.	3,308	Aiton & Co.	2,770
Lighting Corporation, Ltd.	3,256	Mechan & Sons*	2,605

LONDON.—New billiard-room for Hill Lodge, Campden Hill-square, N.W. Messrs. Rogers, Bone, & Coles, architects, 7, Carteret-street, Westminster, N.W. :—

Langdale & Hallett	£1,475	Dobson & Son	£1,279
Dowsing & Sons	1,425	Leal, Willesden-lane	1,176
S. & S. Dunn	1,375		

LONDON.—For pulling down and rebuilding Nos. 162 and 164, Commercial-road, E., for Mr. L. Frumkin. Mr. Ernest H. Abbott, architect, 6, Warwick-court, Gray's Inn, W.C. Quantities by Mr. Alfred Johnson, 34, Imperial-buildings, Ludgate-circus, E.C. :—

Griffiths & Co., Ld.	£2,800	R. & E. Evans	£2,559
F. & J. S. Wood	2,756	J. Wright	2,427
W. J. Maddison	2,596	S. Salt	2,426

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VOL. LXXXI.—No. 3050 JULY 20, 1901.

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St. Mary Woolnoth: Sections.—Measured and drawn by Mr. A. C. Bossom ..... *Two Double-Page Photo-Lithos.*
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Building Estates and the Easement of Light.

We cannot but fear that the man who is not a lawyer will find himself in a mental fog in regard to the law as to the easement of light in connexion with building estates. This is the more to be regretted because the subject is one of practical and increasing importance, and might be made clear and settled by a very small amount of legislation, though in these days the legislative machine drives so heavily that it is almost impossible to secure the passing of any reforms.

That cardinal principle of law, that a man cannot derogate from his own grant, is perfectly well known to most of our readers, and the youngest student should be aware that if a man grant a piece of land on which the grantee erects a house, neither the grantor nor his heirs and representatives can afterwards obstruct the light of such house, unless the grantee's rights have been limited in the first instance.

In addition to the exception to the general right founded upon express agreement, there has been added by judicial decision another, namely, that when the parties intended that there should be a limitation, then the Courts of Law will not enforce the grantee's right. In some cases such a limitation is obvious. There is, for example, the leading case of a railway company which, having by legislation power to take land for the purpose of its undertaking, disposed of a portion of the surplus land, together with a house, and subsequently in the course of its business erected an embankment and obscured the light of the house. Here it was plain that the grantee had no right to unobscured light. He knew when he purchased the property that the vendors were intending to make a railway, and it would have been contrary to the most elementary commonsense could the grantee have interfered with their undertaking.

When, however, we come to the case of building estates we find ourselves in a difficulty. That the buyer of a plot of land on a building estate, who clearly knows that houses will be erected around that which he is going to build, ought not to complain of a limitation of his right, appears obvious. It is certain also that the law recognises this exception. Unfortunately, however, there appears to be no rule deducible from the decisions which will enable the layman without difficulty to know what are the respective rights of grantors and grantees. The leading case in favour of the exception is that of the Birmingham Banking Company *v.* Ross, which was decided by Mr. Justice Kekewich and by the Court of Appeal in 1888. In that case the predecessors in title of the plaintiffs obtained from the Corporation of Birmingham a house looking over a passage 20 ft. wide on to some low buildings. These were subsequently pulled down and higher buildings erected in their place by a person to whom the Corporation had demised the land, and these new buildings obstructed the plaintiff's lights. *Primâ facie* this would clearly have been a case in which the plaintiff was entitled to have his lights protected by the law. But, said Mr. Justice Kekewich, "Mr. Daniell, under whom the plaintiffs claim, must be taken to have known that the Corporation of Birmingham had made large purchases of land for the purpose of constructing a new and important thoroughfare, and that this could properly be done and that they could recoup their expenditure only by selling or letting the land for building purposes. He must be taken to have known what class of buildings were likely to be erected in a broad street in a commercial town." It is clear that whilst the general character of the Corporation's building scheme was shown on a plan, no details were given as to the actual size of the houses to be built on the land. But Mr. Justice Kekewich is entitled to say that there was evidence of a proposed building scheme. "If," said Lord Justice Cotton in the Court of Appeal, "the contention of the plaintiffs is right, it would entirely prevent the Corporation from utilising the land in any way except by putting up a low building." The result, therefore, was that this Court also held that there was no implied obligation on the vendors not to obstruct the light of this house.

When we look at the recent case of Pollard *v.* Gare, also decided by Mr. Justice Kekewich in the present year, it becomes obvious that the intention of the parties must be looked at very closely; and even this—if misunderstood by each other—will not help us much. In that case, two owners of land at Staines, fronting the Thames and the towing-path, were proposing to let or sell it in plots having each a frontage to the towing-path of about 66 ft. and extending backwards for about four times the length. The plaintiff's predecessors took two of these plots on lease, agreeing to build on them a house of a specified character. This they did, and it stood a short distance from the boundary of another plot. The adjoining plots were subsequently sold to the defendant, who, in order to test his right, erected a hoarding for the purpose of obscuring the light of the plaintiff's house. But Mr. Justice Kekewich decided that the plaintiff had a right to his light without obstruction. "It was urged on behalf of the defendant that there was to the knowledge of Mrs. H. at the date of her agreement a building scheme affecting the land, the subject of that agreement, and the adjoining land. What that building scheme was nobody pretended to say, and it is clear that there was no building scheme as the phrase is generally used and understood. The estate was marked out on the plan, if not on the ground, in building lots, and there was also a building line marked on the plan, so as to extend through all the lots; but these are just the facts which in Broomfield *v.* Welham were held insufficient to restrict the application of the doctrine. The right to build remains, but there is nothing from which it can be inferred that the grantors were entitled to build so as to interfere with the access of light."

Broomfield *v.* Williams, to which in the above quotation reference is made, was a decision of the Court of Appeal. The facts in that case showed that the plaintiff knew that it was intended to build on the adjoining land, that he had in fact

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taken part of a building estate. But, said Lord Justice Lindley, "it was quite possible to build on that adjoining land without darkening the windows of the house conveyed." In other words it would appear that the Court did not perceive any knowledge on the part of the purchaser that, by the carrying out of the building scheme, his windows would be darkened. On the contrary, it appears to have been in the contemplation of both parties that the defendant would not build a house higher than that of the plaintiff. In the later case of Pollard *v.* Gare, there do not appear to be any indications of any implied agreement that all the houses would be of a certain height; and that being so, and as the plaintiff likewise knew that the adjoining plot would be built on, it is not altogether easy to see how the plaintiff could properly object to some obscuration of light. It seems not to be unreasonable that if a man purchases a plot of land on a building estate, he should be prepared to have his light obscured, unless he makes a definite agreement with the vendor in order to protect himself, or assures himself by means of plans and elevations that there is a limitation under the scheme to the size of the houses to be erected. To some extent, a man who takes possession of a plot of building land must expect some kind of obscuration to his light. In the last case, that of Pollard *v.* Gare, the purchasers of the plot adjoining that of the plaintiff might very well have assumed that they were at liberty to build as they liked, from the very fact that there was no apparent restriction in the manner of building.

One thing, however, is clear, that it is desirable for owners of building estates, before selling plots of land for building purposes, to make the scheme so systematic that these disputes will not arise. A surveyor can always formulate conditions as to the character of the houses to be erected which, while possibly taking away the full light to all rooms, will not so obscure such rooms as to make them disagreeable for habitation. What is needed is a certain amount of give and take between the owners of the separate plots, but this object cannot be satisfactorily attained unless in the first instance some kind of uniform scheme is planned by an architect. Otherwise the owner of the first plot which is disposed of may be in a position seriously to hamper the development of the rest of the estate, and the respective rights of the several occupiers are left in an uncertain and unsatisfactory state.

ANCIENT CHURCHES OF FAMAGUSTA.

THE famous old city of Famagusta—where three hundred years ago a handful of Italians managed to keep at bay the innumerable hordes of savages of the Ottoman army during a long year's siege—has recently been the scene of some most interesting excavations.

After the complete disappearance of the Christian population of Famagusta, all the former Italian residents having been killed, tortured to death, or carried away slaves to Constantinople, the fortress was placed in a state of repair, and confided to a Mohammedan garrison. Several slight alterations were made in the disposition of the defences, and certain loophooled walls were built on to the cannon embrasures for musketeers, the Turks evidently not employing so many big guns as the Italians. In this way the old Italian work is in some places quite masked and covered over. The interior of the city would appear to have been almost abandoned to a very small population; the hordes which had been attracted by the Turkish generals with promises of loot, came merely to plunder and ravage the island, and probably returned to their native countries on the mainland immediately this object was attained.

During the twenty years of the British occupation of the island the city of Famagusta has suffered more than at any earlier period of its history. It has been turned into a quarry of building stone for Port Said (which may be considered a Famagusta *redivivus*) and other places in the Levant. At the present day very little in the way of domestic architecture remains, and where the houses once stood are patches of rough ground, browsed over by goats and donkeys. The churches have to some extent escaped the fate of the domestic buildings, and it is the ecclesiastical architecture which has afforded M. Enlart so much material for his book on the mediæval antiquities of Cyprus, referred to in our last issue.

In prosecuting his studies, M. Enlart obtained the consent of the English officials to allow him to excavate some of these old churches, and to remove the masses of *débris* encumbering their interiors. Only those churches which had suffered the most from the Turkish bombardment afforded an opportunity for finding anything interesting; those which still retain their vaulted ceiling have, of course, lost all traces of their ancient furniture and tombstones, since they were always turned into stables or grain-stores by the Turks. The beautiful fourteenth-century cathedral was the only church turned into a mosque, a sufficient proof that since the Mohammedan conquest the population of the city must have shrunk considerably.

The churches investigated by M. Enlart are the Carmine, S. Francisco, and the old Orthodox Greek Cathedral of St. George. All these suffered very much at the bombardment; their vaultings were destroyed and crushed down into the naves and side chapels; they seem to have been abandoned as they fell. In the case of the side chapel which M. Enlart has unearthed at S. Francisco, when the excavators arrived at the level of the ancient tombstones constituting its floor, they found human remains which had evidently been crushed beneath the weight of the falling vaults. In the case of the Carmine church, the cannon balls and other signs of the bombardment show that the place has not really been touched for more than three hundred and thirty years.

It is difficult to imagine the ruin of these strongly and scientifically built vaults being due to the comparatively small iron cannon balls of the period, which may be picked up by hundreds still in Famagusta. It is not, perhaps, improbable that the Turks employed for the purpose of destroying a town the enormous stone shot which are so often found stored wherever during the fifteenth to seventeenth centuries they have left traces of their presence. These enormous masses of stone pitched into a town by means of mortars would do terrible execution on both the buildings and the inhabitants, as they split into a thousand pieces at the moment of impact.

The excavations at St. George of the Greeks will probably prove of the very greatest interest; the débris is full of fragments of stained glass, and probably many curiosities may remain at the level of the pavement. Unfortunately M. Enlart is obliged to leave within a few days, as the length of time for his visit granted by the French Government is coming to an end, and the object for which he was specially commissioned has been attained—namely a supplement to his great book on the architecture of the Lusignan period in the island.

Considering the great interest attaching to Famagusta and the fact that these remains are found in so remarkably perfect a condition, it seems the greatest of misfortunes from an archæological point of view that the whole matter should not be carried out in a more systematic and conservative manner. In any other country such "finds" would be carefully protected by hoardings or walls, and it is greatly to be feared that if something of this kind is not done immediately these interesting discoveries will quickly disappear, sacrificed to the wanton pleasure of idle Anatolian peasants. The wonderful series of tombstones covering the graves of French and Italians, which owe a great part of their interest to being *in situ*, will be broken up or stolen; and many of them have a perhaps unique interest in relation to the history of costume.

NOTES.

Lord Wemyss and the Government Offices. LORD WEMYSS has obtained a large majority in the House of Lords in favour of his proposal for making models of the two blocks of Government Offices before the buildings are proceeded with. It is not often that either Chamber shows sufficient interest in art to take any decisive line on a subject of that kind, and we presume that the noble lords who voted for the models have some vague idea that they are thereby furthering the cause of public architecture. We do not see, however, that the expenditure will now result in anything beyond affording a little show for the public; they do not understand drawings, and they will be interested to see exactly what the two new buildings will look like. Lord Wemyss seems to have an idea that there is some mysterious influence in the mere fact of making a model of a building, and that this alone is wanted to revive English architecture. We have the highest opinion of the value of models, not however as toys for the public amusement, but as a means for an architect testing the lines and composition of his own design, for which purpose a rough model during the earlier stages of a design is of far more value than a finished model at a later stage. The money which would have to be expended on the proposed models is, relatively, a trifling matter; but it will involve a loss of time in proceeding with the new buildings, and for no good purpose, for we suppose it is not contemplated to alter the two architects' finished designs after their death—to do so would be a great injustice and unkindness to their memory.

"New Art" Furniture at South Kensington WE entirely sympathise with the protest which has been made in the *Times* by four architects against the acquisition and exhibi-

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tion at the Victoria and Albert Museum of specimens of furniture of what is absurdly called "L'Art Nouveau." We have noticed from time to time in these columns the prevalence recently, in German and French furniture work, of the employment of eccentric twists and curves, as if the object were to surprise one by working the legs of tables and chairs into unexpected and contorted forms, and inserting vagaries of detail which have no relation to structure. This is a new fashion only, not a new art; it does not deserve that name; but it appears that a Mr. G. Donaldson has been anxious that this country should be inoculated with the same folly, and has accordingly bought and presented to the Museum a selection of these furniture vagaries out of the Paris Exhibition, which are placed at the inner end of the tapestry-room at South Kensington. It is a gift of worse than doubtful value. Hitherto the modern English school of furniture design has kept free from these extravagances, and has been notably superior in style and in pure taste to any continental school. Now the examples of the bad and tawdry stuff which is called "New Art" furniture receive the *imprimatur* of the National Art Museum; are put there to be studied and copied, to the detriment of the taste of our own artisans; and (worse still) are, we are told, to be sent round to the provinces, so that the taste of the provincial art-workman may be alike corrupted. This is not what the South Kensington Museum was founded for; it was to be a storehouse of the best art, not a show-room for vagaries in design.

Appeals under the Workmen's Compensation Act.

IT appears doubtful if the Bill introduced by the Lord Chancellor in the House of Lords to amend the Judicature Acts will in the press of business in the House of Commons become law during the present session. One portion of that Bill transfers appeals under the Workmen's Compensation Act from the Court of Appeal to a Divisional Court of the King's Bench Division. It cannot be said that the judgments of the Court of Appeal in this Act have been satisfactory, but that has not a little been due to the vague phraseology and bad drafting of this statute. The Court of Appeal has taken a narrow and technical view of the Act; the House of Lords, under the guidance of the Lord Chancellor, a wider and more liberal view. But taken as a whole the decisions of a Divisional Court are less likely to be regarded as satisfactory than are those of the Court of Appeal, and there will be many who would prefer to leave the appeals as they now are. Should the measure become law its efficiency will depend on the action of the Lord Chief Justice with whom will rest the composition of the Divisional Court. Some judges of the King's Bench Divisional Court are notoriously bad lawyers though able men, others are capable lawyers as well as acute men of the world. If these appeals are to go before a Divisional Court it should be carefully composed of judges conspicuous both for common sense and legal knowledge.

Two Important Gas Bills.

Two gas bills of considerable importance to gas consumers in general, and which have already passed the House of Commons, and been discussed in previous issues of the *Builder*, were last week considered by Committees of the House of Lords. The preamble of the South Metropolitan Bill was found proved, subject to the exclusion of the proviso in the transfer clause that "all moneys which the Gas Light and Coke Company shall receive from any Local Authority for public lighting in excess of that which the said Gas Light and Coke Company would have been required to charge but for the transfer of the said undertaking shall be applied to a reduction of the price of gas supplied to the private consumer." The important condition that the South Metropolitan Company shall not be allowed to purchase the property and rights of the Gas Light and Coke Company on the south side of the Thames until the latter company have obtained power from Parliament to raise additional capital, remains in the Bill. The second Bill, known as the Mond Gas Bill, which is to sanction the supply of cheap fuel gas throughout a large area in Staffordshire already supplied with coal gas, was also approved, the preamble being reported proved by the Committee, subject to certain slight alterations being made in the Bill. The Mond scheme is a new departure in gas supply in this country, although in America an attempt to supply cheap low-grade gas for fuel purposes was made some time ago, but did not prove a financial success. Should the Mond scheme meet with success, there is little doubt that throughout the country the public demand for gas of high illuminating power, which is necessarily costly, will be superseded by a demand for cheaper low-grade gas.

Railway Communication with Dalmatia.

ON the 17th inst. a new railway connecting Austria, Bosnia, and Herzegovina with Dalmatia was opened. The new line branches from the Metkovic-Mostar railway near the latter place, and ends near Castelnuovo, in the Bocche di Cattaro. We went over part of the line last autumn, and have no hesitation in saying that it is a triumph of engineering. It passes for the most part through barren, mountainous country, which presented many difficulties. Although the new railway is doubtless primarily intended for strategic purposes, to assist in the fortification of the new Austrian naval arsenal at Teodo, in the Bocche di Cattaro, it will be hailed with great satisfaction by those archæologists and students of the Balkan peninsula who have hitherto been practically compelled to keep to the coast for the want of conveyance, and by others who have had to perform the tedious sea journey from Trieste to Cattaro. Like its new branch line from Hum to Trebinje, this railway will enable Montenegro to be opened up, if ever the independent Montenegrins can be got to assent to it. There is, however, one cause for regret: the Bocche di Cattaro, with the road up the mountains to Cettinje, is one of the most beautiful pieces of scenery in Europe; the "tourist" has already made his appearance; and though the railway through it will fortunately never succeed in climbing the heights to Montenegro, it will popularise the Bocche, and from interesting Dalmatian villages we shall see the places transformed into modern holiday resorts.

Tramway Brakes.

THE problem of the best system of brakes for electric cars is one which has been exercising the ingenuity of inventors for several years. The regulations issued last year by the Paris police show the severity of the tests to which the brakes are subjected. Every car has to be provided with brakes sufficiently powerful to stop it in 20 metres (21·8 yards) on a down gradient of 2 per cent. when running at a speed of 20 kilometres (12·4 miles) per hour. They also stipulate that every car must have two independent brakes acting on all the axles. At the Edinburgh meeting of the Municipal Electrical Association, Mr. Fell, the tramway engineer to the Sheffield Corporation, read a valuable paper on this subject. The main classes of brakes discussed were hand brakes, friction brakes, slipper brakes, pneumatic brakes and electro-magnetic brakes. Slipper brakes are extensively used in England. They consist simply of wood blocks which are pressed down on the rails by means of levers. They are so designed that it is impossible for them to lift the car off the rails. Where there is a steep gradient they, in conjunction with other brakes, are nearly always used. They are specially advantageous on single lines, for the descending car cleans the rails for the ascending one. The electro-magnetic brake is the most powerful. It consists of two cast-iron discs, one of which is fixed to the motor and has a coil of wire wrapped round it, the other is keyed to the axle. On turning the handle the motors act as generators which in itself produces a very powerful retarding force on the car and send a large current through the disc coil. The discs are thus strongly magnetised and put a powerful drag on the axles. The braking action is so strong that the wheels will at once skid unless a plentiful supply of sand is available. Mr. Fell recommends that hand and slipper brakes be ordinarily employed, and that the electro-magnetic brake should be kept for emergencies as the wear and tear caused by it is excessive. Pneumatic brakes were spoken of disparagingly, but they are used successfully in France. In Paris the Compagnie Générale des Omnibus use the following brakes: (1) a pneumatic brake applicable by the driver; (2) an automatic compressed air brake for both driver and conductor; (3) a hand brake for both driver and conductor; and (4) an electro-magnetic emergency brake for the driver. It may fairly be questioned whether this tendency of tramway engineers towards a multiplicity of brakes is advisable. It seems to us that it gives the driver too much to do on an emergency.

An Urban District Pigstye.

DR. WHEATON'S Report to the Local Government Board on the sanitary condition of the Bishop Auckland Urban District reveals a state of things about as bad, in a sanitary sense, as it can well be. Everything seems to be in a bad state—dwellings, roads, water supply, sewerage, and scavenging. There are a number of back-to-back dwellings without means of through ventilation. In the northern and old part of the town there are collections of dilapidated old dwellings fronting the streets, having between them narrow passages leading to courts in their rear. The dwellings fronting the street have been built in a very irregular manner so as to obstruct lighting and ventilation. They have no curtilage, or have only a very small yard approached by a passage. This yard is often almost entirely

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filled by a midden privy of the most unwholesome type, often used in common by the inhabitants of two or more dwellings. In other cases the yards are paved with cobble stones, and are often badly drained, so that the water stands in pools after heavy rainfall, and soaks into the ground in the neighbourhood of dwellings. In some yards there are long open channels of cobble stones or brick into which liquid refuse is thrown, and from which a great part of such refuse escapes by percolation into the ground before reaching the gullies in which the channels terminate. The water supply is obtained from the river Wear as it passes the town. The waterworks are the property of the Urban District Council, and date from the year 1856. The water is collected by open-jointed pipes laid in the river bed and conveyed by a collecting pipe to a filter, from which it passes to a well, whence it is pumped by a force-pump driven by turbines to the reservoir in the town. Owing to floods and to the comparatively small capacity of the town reservoir, viz., 375,000 gallons, unfiltered water is from time to time supplied to the town, and the Report adds that there is no doubt that this river is grossly polluted, and that to supply such water in an unfiltered condition is an absolutely unjustifiable proceeding. In regard to sewerage, the Council have not caused plans to be made and kept up, and the position of some of the sewers is in consequence not known to the officers of the Council. Property owners have from time to time connected the drains of new dwellings to the sewers, apparently without supervision. The sewers, which were mainly constructed about the year 1850, have not all a sufficient fall, nor are they laid in straight lines, and in some instances the fall is in the opposite direction to that which was originally intended. The majority of the sewers are constructed of tiles, in a manner which renders them practically identical with what is known as a rubble drain. Excrement disposal is mainly effected by midden privies, and scavenging is performed partly by the District Council, partly by a contractor:—

"The method is most unsatisfactory, and is such as to directly favour the spread of enteric fever. The contents of midden privies having been emptied into the road, street, back street, or yard by men in the employ of the Council, it is the business of the contractor to remove the heaps of filth into carts and convey it out of the district. As the result of this system the ground of the streets, roads, back streets, yards, and passages in the town is polluted by filth, which, owing to the endemic prevalence of the disease in the town, must often contain the infective matters of enteric fever."

We have not space to quote further, but what follows in the Report is still more unpleasant reading. When it is added that the condition of many of the public streets is such that they are almost impassable, while "many of the back streets are sloughs of filth and refuse, mixed with mud many inches in depth," this picture of a market town in the twentieth century becomes delightfully complete.

Sanitary State of Hexham.

DR. E. P. MANBY'S Report to the Local Government Board upon an outbreak of typhus fever in the Urban District of Hexham, states that the town has a good public water supply, derived from springs in the millstone grit at Allendale Common, about ten miles to the south, and the system of sewerage and house drainage appears to be not unsatisfactory. The only part of the town where poor class tenement property prevails is in a small low-lying area adjacent to Gilesgate. In this locality many of the houses are old and crowded together, and typhus fever, if introduced into Hexham, had in this neighbourhood special opportunity for spreading. The most specially unhealthy portion appears to be a block of houses called "The Mystery." This consists of ten houses, side by side; four of them three-story and the remainder two-story. The tenements on the upper two floors of the four large houses are approached from a back yard, unevenly laid with cobble stones except for a paved strip adjoining the houses, and shut in by a 10-ft. brick wall and by other houses, so as to render free circulation of air almost impossible. Through ventilation in some of the houses is also very badly provided for. "The Mystery" was only erected some twenty-four years ago, and it appears that the Medical Officer of Health expressed at that time his disapproval of the plans submitted. If this be so, a heavy responsibility, as Dr. Manby observes, rests on those who allowed the building to proceed.

Hollingbourne, Kent.

THE fine old gabled manor house at Hollingbourne will be offered for sale by auction next week. It stands close by the ancient British road, since known as the Pilgrims' Way, as it passes eastwards from Aylesford along the southern slopes of the north range of chalk downs, overlooking the fertile valley below. It is believed that the manor house occupies the site of one which Athelstan bought from his father, Ethelred II., and bestowed, 980, upon Christ Church, Canterbury, and that the greater part of it, as built by the Colepeper family in the earlier half of the sixteenth century—the north wing has been pulled down—encases the fourteenth century house. The end wall of the Elizabethan hall embodies an Early English doorway. Many of the original features have been preserved, including the oaken doors, panelling, and beam ceilings, the open stone fireplaces with high chimney-pieces and fire-backs, and the six-turn staircase with newels carved in oak, which leads to the gallery, 60 ft. long, and the rooms on the upper floor; an ivy-clad parapet wall encloses the beautiful old garden. In the church, which was restored by Sir G. G. Scott, and for which a new vestry is being built from Mr. W. D. Caröe's designs, are monuments of the Colepepers of Hollingbourne and the neighbouring Leeds Castle. An extension made in the latter half of the fifteenth century of the north aisle has been converted into the "Colepeper" chapel, the floor being raised and the walls faced with flintwork. The name of the parish is said to be derived from the holly trees, which, together with the yews, and the thorns at Detling and Thurnham on the west, mark the track of the now almost deserted Pilgrims' Way, formerly the main road through the South-East of England.

The Allan-Fraser Art College, Arbroath.

THERE will shortly be opened at Hospital-field House, which stands upon the site of the hospice of the Abbey of Arbroath, the Art College endowed by the late Patrick Allan-Fraser. The bequest provides for the gratuitous maintenance and instruction of a limited number of fully qualified students, who do not enjoy private means, in sculpture, architecture, painting, wood-carving, and engraving, landscape-painting, and drawing from the life, during a course of four years, for the cultivation of the home-farm, travelling studentships, lectures upon art and science by outside lecturers, prizes, and kindred benevolences. The trustees have appointed Mr. George Harcourt, of Bushey, as resident governor of the college, for which some studios have been erected, and which is to be opened next October for the reception of Scotch, English, and Irish students who purpose to make art their profession.

The Fine-Art Society's Gallery.

THE Fine-Art Society have on view four oil paintings by Mr. MacWhirter, being views of the Yarrow and Newark Tower; Moray Firth and the Findhorn; the Pass of Killiecrankie; and what in the catalogue is incorrectly called "Ridpath Castle, on the Tweed." There is no such castle; what is painted is the well-known and picturesquely situated Neidpath Castle. This is the finest picture of the four, and has much less of the artist's usual mannerism and signature of the white birch-stem. In the same room are a number of large and powerful water-colour drawings of scenes in Kashmir, by Colonel Strahan, R.E., who we presume must take rank as an amateur, but an amateur of unusual qualifications. These are to some extent topographical pictures; their illustrative quality was perhaps the first consideration; but they give powerful impressions of the barren rocky scenery of the Kashmir ranges, with some studies of native architecture and of Ganges scenery here and there, and make a collection which is well worth a visit. In the middle room is a small collection of etchings, &c., by Mr. Herbert Dicksee, mostly original, some of them after pictures by other artists. The two ploughing scenes, numbered 1 and 2, are among the best of the works, and are finely conceived little pictures, and the studies of tigers and lions are very interesting.

MUNICIPAL BUILDINGS COMPETITION, HEREFORD.

THE designs for the proposed new Municipal Buildings for the City of Hereford were on view to the public on Saturday and Monday last in the Shire Hall. The scheme is not a very extensive one, and forty-six designs have been received, some of which are of very considerable merit.

The site is a good one, and is situated in the wide thoroughfare of St. Owen-street. Some existing buildings are in the rear which it is proposed to retain, and finally to incorporate them with the present proposed scheme. The site has a frontage of 99 ft. by about 180 ft. in depth.

Provision was to be made for an Assembly Hall seating about 400 persons upon the first floor, and to be in the front; the council chamber was also to be on this level, a stipulation being that ample means of egress was to be provided—an important condition which a large number of competitors do not seem to have fully realised.

Three premiums were offered with the usual stipulations, which we think without reason, as to certain limitations in the ultimate choice by the Corporation. We have pointed out before, and it is necessary to do so from time to time, that while premiums are necessary, and should as far as possible be upon a liberal scale, yet architects do not compete for these, for they might be more advantageously employed, but rather for the commission of carrying out the proposed building.

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Among the large number of designs hung are some very interesting and pleasing proposals, and it would be possible to indicate several which, with a few modifications in plan and taken all round as architectural compositions, might be esteemed to be far superior to the three premiated designs and to the three further designs "reserved" for consideration by the committee.

The assessor, Mr. Thomas Blashill, has placed first the design under Motto "1,002" (No. 3). The plan is divided by two corridors from front to back. The entrance hall uniting these has the principal staircase; the lavatories behind on a central area, which also lights the corridors. Another entrance hall is provided at the right-hand corner of the front, which gives the second important staircase. Between this entrance and the principal one has been placed the rates office. Whether this is accidental or designed is immaterial; but it meets the local necessities; as in Hereford a discount is allowed on the rates, and a last day comes, and with it a great crowd of ratepayers, so that an entry and exit close on the street are essential. This in the premiated design is fully secured. On the other side of the principal entrance the town clerk has a good room (24 ft. by 19 ft. 9 in.), with his clerks' office, a room 15 ft. 6 in. by 16 ft. 6 in., behind; this room is beneath an archway, and the lighting to it is very bad indeed. The first floor is well and adequately considered; the assembly-room is in front, with the two large staircases affording separate exits. The assembly hall has its platform well contrived, with retiring-rooms and lavatories, and seems to be the only one in the competition with an adequate green-room. The mayor's parlour is placed on the right side, half way between the hall in front and the council chamber behind, his robing-room adjoining the latter apartment and the rooms arranged *en suite*. The authors say that the design has been planned so that the municipal department may be used separately or conjointly with the public.

The architectural character of the design is very indifferent and un-municipal, and may be described as a front with an acute pediment at either end, some pilasters and arches in brick and stone, and a ventilator in the roof. It is unrecognisable as a town hall, and the perspective is a poor production. A plan may be modified and improved, but no amount of tinkering by a draughtsman could make this design appear externally as an adequate building for its purpose, though the plan is not without considerable merit.

The second premium goes to "Camelot" (No. 10). This design also is well arranged in regard to the rates office, but the inspector of nuisances has the best place in front, while the town clerk is pushed to the back, which order should have been reversed. The upper floor is, however, better in arrangement; the hall is in front, the council chamber at the back; the arrangement of seating should be reversed, so that the mayor has easy access thereto. The committee and other rooms on the right are *en suite*. The front is of Bath stone, in what, for lack of a better term, may be called erratic Ionic, the desire, according to the report, being to get a "well balanced composition, worthy of a town which contains such a beautiful cathedral"—a proper aspiration, which we regret the elevations do not exemplify. The perspective does not improve the qualities of the design.

The third premiated design is that signed "Hope" (No. 7). The design has good points in the plan, not unlike the first; the elevations are in black and white and are very uninteresting; an elaborate perspective is shown in hot yellow stone or terra-cotta. The general character of the design, with segmental arches and small ornamental turrets, is of a type which was popular thirty years or more ago. The small sketch perspective of the staircase might well have been omitted.

The next three designs to be noted are those "reserved for consideration." Of these, No. 21 (photo of perspective on report) has a powerful sepia perspective which seemed to attract considerable admiration, and one instinctively was reminded of that assessor who, once upon a time, on entering the room filled with drawings, said, with horror, "Please cover up all the perspectives with brown paper." It undoubtedly suggests what it is—too much so, perchance; his municipal type, the author "is of opinion, would equal that of any other edifice in the county." The plan is not, however, without good points. The staircase is a semicircle on plan in the centre, the council chamber is up three flights, and the surveyor placed on a mezzanine. The sections are poorly rendered and the decoration has a cheap appearance, but the whole get-up betokens competition fever haste.

The second "reserved" design is "Simplicity" (No. 28). We confess our inability to see any reason for this design to be reserved, and we venture to think that lack of both knowledge and experience of the subject is shown in the plan. The front is composed of curved bows, a porch extends right over the pavement, the great columns of which have no entasis, while the columns of the inner arch have an exuberant bulge. The perspective is the best part of "Simplicity's" exhibition on nine strainers.

The remaining reserved design is that under the motto "Fortis in arduis" (No. 29). The interior of the plan is well lighted, but there is little evidence of scientific study; the drawings are in sepia line and of indifferent character; the front, an elaborate terra-cotta one, is seen to better advantage in the ink line perspective.

We turn now to some of the more interesting designs exhibited. The one distinguished by the device of a rose in a square is a fine design and a good plan, which, although possessing great merit, is not entirely free from defects. The centre of the building is occupied by a court, 40 ft. by 27 ft., with two staircases, one on either side; but, as far as exit is concerned, these meet. The rates office is at the rear, and but slight modification would be necessary to make this amenable to local usage. To an orderly plan is added a dignified elevation, monumental and municipal in character. The design is for execution in stone and is Classical in type, and the author is to be heartily congratulated upon the general refinement of character in the whole work. The assembly room is well marked externally by long windows and the Ionic order. The gabled window to the left is heavy in detail, and the figures in the curved pediment have a rather crowded and uncomfortable look. This design, however, is in the main of a high order, and is well illustrated by a fine perspective view coloured by Mr. J. J. Joass.

Another very interesting design is that by "Quex," which has many excellent points. The building is somewhat sacrificed to a fine loggia, the wings are kept down and are masked by great plain ramps; the first floor has a series of pedimented windows, the architraves looking somewhat thin. Between these windows upon the red brick wall are large pendant bunches of foliage, rather out of scale with the other detail. The detail of the sections is too elaborate for the cost. The design is somewhat overweighted by the roof turret. The draughtsmanship is excellent, with some fine, vigorous, figure sculpture; the elevations are projected in shadow. There is one of the most brilliantly-executed perspectives in pencil and colour we have seen of late years.

"Civic" is a commendable effort by a local firm; the plan, however, is not fully considered. The elevations are of a florid Renaissance character, inked in and touched up with charcoal. The large perspective is a characteristic piece of work, executed with soft pencil, and has a rather woolly effect. The sections are very undesirable in detail.

The plan of "English Renaissance" shows the principal entrance at the side; a single corridor runs from front to back. The front elevation is a decided success, well-balanced and broad, with rustic base, corniced windows to the first floor, with curved pediments over, surmounted by entablature and balustrade. The drawings are well executed, but the perspective does not do the design justice.

"Hiram" has the most pretentious production in the exhibition, with good elements in the plan. The front is flanked by curved pediments, and the centre crowned with a young "Oratory" dome. The perspective, in pencil, does not benefit the design much.

"4,321" is a very able and compact design, economical in lay out, and with knowledge of working. A fine, vigorous perspective in colour is shown; the defect seems to be want of sufficient consideration of exits, as but one public staircase is provided. The elevations are in a pleasing yet simple and thoroughly English style. The front elevation is divided up by grooved stone piers enclosing circular-headed windows to the assembly-room, the ground story being divided in each of these bays into three compartments by Doric columns. The central feature is a pediment and coupled Ionic pilasters, a magnificent projecting clock, and a very picturesque balcony over the columned entrance. The roof is overweighted by a great turret, and the chimnies are grouped at either end. Dignity without elaboration has been thoroughly attained, and the whole looks what it is meant for—a town hall for a cathedral town. The drawings are of a high order of excellence.

"Red Star" is an elaborate and expensive proposal, with plenty of carved friezes and without either restraint or repose. The plan has many extravagant features. This is a very contrived effort, and, looking at this and others, it is wonderful to think to what lengths ingenuity without purpose will go.

"Halfpenny Stamp in Circle." Entrances are provided on either side. The front has pediments at the ends with finnicking figure friezes, but the whole composition requires tying together and shows to better advantage in the monochrome perspective. The character of the back elevation is, however, distinctly interesting.

"One in Green Wreath." This is a very able design, with an excellent plan in which all the difficulties seem to have been met—a fine dignified staircase, with an ample second staircase, for the assembly hall, other smaller staircases being conveniently disposed to give abundant access. The rates office is at the side close to an entrance, and a lobby would make this fully meet the local uses. The elevation is dignified and restrained—Renaissance without fussiness. The façade occupies the whole frontage, with large arches at either end. The whole design would altogether make a very satisfactory building, as it thoroughly, by its plan and elevation, expresses its purpose. A pencil and wash perspective is shown.

"Utility" has an excellent plan marred by inattention to exits. The front elevation shows a broad and dignified treatment, but the façade is broken rather by the entrance not being in the centre, and this is emphasised by a curved pediment above it and a clock, the remaining portion of the front being treated in a different manner. The drawings are excellent and show considerable skill, and there is a fine, freely executed perspective, strongly shown in pencil and tinted in lamp black, the whole being thoroughly municipal in character. This is, as far as we observed, the only design with isolated lavatories on the outside.

"Architecto" has a hot colour scheme on the plans, in vivid contrast to the plain, thick ink lines of the elevations and sections. This shows the plans and scheme at a glance, which has been well and architecturally considered. The principal elevation is a heavy lined drawing, and looks like a magnified plate out of "Vitruvius Britannicus." The perspective, which is a large one, is in ink and of up-to-date manner, but does not better the elevation in character; the sections are very suitably treated. "Architecto" has a firm hand in the printing line, as some of his down strokes are quite a quarter of an inch wide.

Among the remaining sets, "Ionic" may be mentioned as a civic-looking design somewhat in the manner of Colchester, of a monumental character and shown in a fine water-colour perspective. "Mercia" looks like a Venetian palace flanked by two great flag posts; the drawings are very good and complete and full of suggestion. "Hereford" shows some good and pleasing work, but he has put the assembly hall at the rear; the elevations have merit, and there is a fine line perspective. "A.D. 1901" is the only competitor who has ventured on a tower, which was not asked for; but the design has an important appearance. "Coningsby," "Rex" and "Wye," are designs which show good points.

It is worth note, as an instance of the manner in which competitions are gone into now, that as many as six perspectives are, if we mistake not, from the hand of one draughtsman.

The awards in this competition we cannot profess to understand, and it is not surprising that they seem to have excited both surprise and anger among some of the competitors. The selection by the Corporation of three other designs, with the view of considering them as in opposition to those selected by the assessor, is a most irregular proceeding. The whole thing appears to have been much mismanaged, and the best designs, in an archi-

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tectural sense, to have been entirely passed over, both in the premiated and "reserved" list.

Since the above notice was written, we have received the following list of the names of the authors of the premiated and "reserved" designs :—

First premium : Messrs. Macintosh & Newman (London).

Second premium : Mr. H. T. Fowler (Barrow-in-Furness).

Third premium : Mr. G. H. Stanger (Wolverhampton).

The three "reserved" designs are by Mr. H. T. Cheers (Twickenham) ; Messrs. James Brooks, Son & Godsell, (London) ; and Messrs. W. J. Morley & Son (Bradford).

GLASGOW INTERNATIONAL EXHIBITION.

SANITARY FITTINGS, &c.

THE sanitary exhibits at the Glasgow Exhibition are scattered throughout various parts of the Industrial Hall, Grand Avenue, Machinery Hall, and in some of the detached pavilions, and are therefore not to be found without some difficulty. The most important group is in the south-east court of the Industrial Hall, and merits first attention. At stand No. 80 a working model of the Septic Tank system of sewage treatment is shown, including a new automatic alternating gear for the filters. We have already described the principal features of this system and need only draw our readers' attention to the small pamphlet (which can be obtained at the stand), containing numerous photographs of installations for towns, barracks, private houses, and other buildings.

The next exhibit (No. 81) is that of Messrs. Shanks & Co., and consists of sanitary fittings and model bathrooms. Among the lavatories we noticed one with a porcelain basin and a beautiful Mexican onyx slab, and another, known as the "Treviso," with the basin and top in one piece of porcelain, the top being oval-fronted and supported on a simple framework of round nickel-plated brass tubes. In both these fittings the new "Perfecto" siphonic waste is used. This appears to be an admirable contrivance, but we had not the opportunity of seeing it in action. It consists of a tube with a metal flange about 1½ in. from the bottom, the flange having a rubber collar under it to seat tightly against the circular pottery outlet of the basin. This outlet is flanged at the bottom, so that a lead or brass trap with flanged inlet can be bolted to it. The tube forms a standing waste and overflow, but differs from the ordinary arrangement in having an inverted cup or dome over the top, with a small airhole through the crown. This cup forms with the tube a siphon of the dome type, and if the taps are left running when the waste is closed, the water rises to the top of the tube and overflows in the ordinary way; but if the supply is greater than the overflow can thus discharge, the water continues to rise in the basin till a sufficient head is obtained to start siphonic action ; this rapidly discharges the water down to the normal level. The tube is fitted to the back of the basin in a simple manner, and can be easily removed. The same form of waste and overflow, but on a larger scale, is fitted to a white porcelain-enamelled iron bath. Excellent baths of vitreous-enamelled iron and porcelain-enamelled fireclay are also shown. The fireclay baths are decorated outside, and one of them has a combined supply fitting, operated by a handle, which can be turned around a dial-plate from "shut" to "cold," "tepid," and "hot." Cold water must therefore be turned on first. The valves are non-concussive, and the fitting is well adapted for public baths and other buildings. In one of the model bathrooms an iron plunge-bath with white enamelled zinc hood is shown. The body of the bath has a wide roll of ordinary shape, but around the foot of the bath a splay takes the place of the roll, and the hood is fixed within the splay in such a manner that there is a clear space between the hood and the bath, while splashing is prevented. In the other bathroom there is, in addition to a porcelain plunge-bath, a tubular needle-bath (comprising wave, spray, and shower) fixed on a dished marble slab with brass outlet-grate. In this bathroom there is also a lavatory basin with an oval white marble slab standing clear of the wall. Among the sinks we noticed a butler's sink of white glazed fireclay with two compartments, fitted with simple standing wastes and overflows, which can be easily removed. Water-closets of the wash-down and siphonic types are shown ; one of the latter has a three-gallon flushing cistern fixed immediately above the seat, the cistern having a floating valve and 3-in. outlet. The "Aqua-jet" cistern is a siphonic cistern of novel type, requiring a remarkably gentle pull and being almost noiseless in action ; for fixing immediately above the basin, it is made to hold three gallons, and has a 2¾-in. outlet. Among the other fittings are an enamelled iron sitz bath, a bidet, towel rails, and other bathroom accessories. The simpler of the two model bathrooms has a mosaic floor and tiled walls, and the more elaborate has the walls faced with slabs of white statuary marble with dividing strips and frieze of light greenish marble, the frieze having a key border of Venetian gold mosaic. The exhibit, taken as a whole, is most interesting, and well worthy of the reputation of the firm. Messrs. Shanks & Co. have generously fitted up all the lavatories, urinals, and water-closets throughout the Exhibition and grounds, as well as the lavatories in the Royal Reception Rooms. These fittings are of various types, and are well worthy of inspection, as they can be seen in actual use.

At the next stand (No. 82) Messrs. Charles Buick & Sons, of Alloa, have a varied assortment of sanitary fittings, drain-pipes and traps, terra-cotta ridges and finials, flower-pots, &c. Perhaps the most notable fitting is a range of stall-urinals in amber glazed fireclay ; each stall has the base, curved back, and perforated flushing-rim in one piece. The front pillars and capping are of white glazed fireclay. Another range is on similar lines, but with white glazed stalls and marbled pillars and capping. We noticed also a good flushing-rim slop-hopper with back and sides 16 in. high to prevent splashing, and a range of three school lavatories bolted together so that two pedestals serve for the three basins ; the basins have rubber waste-plugs and large overflows protected with nickel-plated brass grates, each of which can be removed after taking out one screw. Among the other fittings are a siphonic water-closet, a large white glazed fluted mortuary slab, three wash-tubs, and three enamelled fireclay baths, one of these having a side outlet.

Messrs. Doulton & Co. have a large and interesting exhibit of faience, sanitary fittings, glazed-ware fireplaces, tiles, &c., at stand 83. The baths include vitreous-enamelled cast-iron plunge and sitz baths, nickel-plated tubular bath comprising wave, spray, and shower, and fixed on a vitreous-enamelled iron dish, and a plunge bath with hood for spray and shower. These are all well made with smooth and perfect surfaces, but do not possess any particularly novel features. The asylum bath fittings with special regulator to avoid scalding are decidedly ingenious. The valves are non-concussive, and are operated by a loose key which can be fitted on the end of the spindle passing between the valves. From this spindle two levers or arms project over the press-buttons on the tops of the valves and work on eccentrics in such a manner that as the key is turned one lever is gradually depressed on to the cold valve, thus starting the cold supply ; a further turn of the key brings the second lever down on to the hot valve, so that tepid water is supplied ; and as the turning of the key proceeds, the hot lever is gradually depressed still more, while the cold lever is gradually withdrawn, so that at last only hot water is supplied. The fitting works very smoothly and is well made ; it is protected by a metal case with a key-hole opposite the spindle. A somewhat new departure is the employment of cast-iron for wash-tubs ; one of these finished with white vitreous-enamel measures 2 ft. 11 in. by 2 ft. 1 in. by 16 in., and has a 2-in. vulcanite plug, loose vitreous-enamelled iron back 11 in. high, and enamelled-iron supports. There is also a neat porcelain lavatory with basin, top, back, elbows and frieze in one piece, and supported on T-iron brackets concealed by the side friezes ; it measures 27 in. by 19 in. and has a vulcanite plug and open-top overflow protected by a hinged grate. A massive lavatory in white glazed fireclay, supported on enamelled iron legs, appears to be almost unbreakable ; it has an open-top overflow and safety-plug, and is fitted with a loose back of white glazed fireclay. A strong oval-fronted operating lavatory in glazed fireclay measures 2 ft. 7 in. by 2 ft., and has an open-top overflow and treadles for the hot and cold supplies. The most elaborate lavatory has an onyx slab and back, and nickel-plated legs, and is a very satisfactory piece of work. Stall urinals in glazed ware, and others in glazed ware and marble, are shown, with distributing nozzles for the flush.

A range of siphonic trough-closets is fitted with a small chamber containing a float-valve, which rises with the usage of the closets and ultimately starts the siphonic action of the flushing cistern. The recurrence of the flush is thus automatically controlled by the usage of the closets. Strong stoneware wash-down closets for factories, &c., are shown, and valve and siphonic closets for buildings of a better class. The valve-closet has a marble seat and enclosure, and the flush is actuated by a press-button (push and let go). One of the siphonic closets has a similar press-button, the flush being obtained through a regulating valve instead of the usual cistern. The latest type of hospital bed-pan sink, known as the "St. Thomas," is a well-designed fitting of massive character. It measures 21 in. by 16 in. inside the flushing rim, and is supported on a simple enamelled cast-iron bracket (shaped like a man-hole step), the ends of which are built into the wall. The hopper has a flanged outlet, to which a P-trap is bolted, and the trap has a lead socket on the outlet for connexion to the lead soil-pipe. The bedpans can be cleansed by means of a jet worked by a treadle, and the same action starts the flushing apparatus, so that the contents of the pans are at once removed. There is also a slop-hopper suitable for houses and hotels ; a brass grating is ingeniously contrived to protect the front roll, and is hinged so that both grating and roll can be thoroughly cleaned. The hopper has a pottery outlet-grid, and above this is a large loose brass grating with rubber buffers which serves as a stand for utensils which are being washed or filled with water.

The last stand in this group is No. 84, and is occupied by the large exhibit of Messrs. Twyford, Limited, of Hanley. One of the most conspicuous objects is a three-compartment sink in one piece of enamelled fireclay, measuring 7 ft. 4½ in. by 2 ft. by 15 in. deep, the back being 9 in. higher. This is a fine example of the potter's skill. The "Ruchil" sink, used in the Ruchil Hospital at Glasgow, is of fireclay white-enamelled inside and outside (except underneath), and supported on pedestals of the same material. The "Brentford" slop-hopper and sink is in one piece of enamelled fireclay, but the hopper is only 9¾ in. in diameter inside the flushing rim. The new form of the "Middlesex slop bed-pan and scalding sink" for hospitals is made in one piece (instead of two as formerly), and measures 4 ft. 3 in. by 22½ in. ; the hopper has a perforated flushing rim and the sink has a simple gun-metal lift-out standing waste and overflow. The "Birmingham" slop hopper and drainer is also in one piece, but of simpler design, a draining slab taking the place of the scalding sink. The hopper is square at the top, and has a circular brass grate at the outlet ; a pipe rises from the slab and curves over the hopper to form a bedpan nozzle. A slop-hopper for houses has a perforated flushing-rim, brass outlet grate, hinged brass grating with rubber buffers (for supporting utensils), and an inserted wood rim along the front. A group of four lavatories arranged in the form of a square forms an excellent independent fitting ; a shower-rose is attached to a pipe rising from the centre and swivelled so that the shower can be turned over each basin. The "Hydro" is a new form of lavatory standing waste, somewhat similar to this firm's "Neros" waste, but fixed clear of the back of the basin. An enamelled fireclay bath with ridged bottom (to prevent slipping) is also shown ; it has a wood rim along the front, and a shelf along the back in one piece with the bath. Among the bath-fittings we noticed a set for asylums, so arranged that the hot spindle is covered until the cold spindle has been turned, and also a set of fittings with mixing chamber and thermometer for regulating the temperature of the water. The firm's well-known siphonic closet is shown, and we noticed also a "detachable" closet outlet joint ; in this joint a brass collar (screwed outside) is attached to the pottery outlet of the closet, and the joint is completed by a brass union and tail-pipe after the manner of the ordinary lavatory unions.

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"Adamant" urinals in straight and hexagonal ranges are also shown, together with a new design, in which the base, back, front pillars, and capping are in one piece of glazed fireclay, measuring 5 ft. 6 in. by 2 ft. 6 in. by 1 ft. 9 in. A horizontal groove is formed around the curved back for the reception of the copper sparge pipe, which is fixed by a single nut in the centre.

The next important exhibit of sanitary fittings will be found at Stand 85 on the right-hand side of the Grand Avenue, and is owned by Messrs. T. B. Campbell & Sons, of Glasgow. The principal feature is a bath-room suite made by the Standard Sanitary Manufacturing Co., of Pittsburg, U.S.A. Two baths are shown —plunge and sitz—both being of white-enamelled cast-iron, excellently finished; the lavatory basin is of porcelain, and has an oval white marble slab 2 in. thick with roll edge and dished around the basin; the combined waste-and-overflow is of the standing type and is placed in a metal cylinder behind the basin. The siphonic water-closet has a jet in the bottom of the basin after the manner of Twyford's siphonic closet, and the cistern is placed immediately above the seat and is started by pressing a button; the cistern is of white glazed pottery, with marble top, and the closet seat and lid are of wood enamelled white with good effect. Cassels's patent "Clarifont" lavatories are of Scottish manufacture, and are well adapted for schools. They are of the constant-stream type, and basins in ranges can be supplied with water, either separately or simultaneously. For separate supply the water issues from the tap or taps into a small compartment at the back of the slab, from which it rises into a shallow circular bowl in the centre and overflows thence into a channel between the bowl and the rim of the slab. The water escapes from the channel through a grid into a conduit passing under the central bowl to the waste-outlet under the small inlet compartment. An indiarubber ball plug is used to close the bottom of the inlet compartment when the basin is in use. A slightly different arrangement is adopted for ranges, the channels of the several basins communicating with each other, so that one waste-pipe serves for the whole range. The basins are made in enamelled fireclay or cast-iron, and in various sizes. Other designs than those described are now made, but all have the same inner basin with the water welling up from the bottom, and carrying away the soap and dirt immediately and continuously. Among the other exhibits at this stand are a stack of lead pipes from ¼ in. to 8 in. in diameter, and a number of taps and other fittings in brass, copper, German silver, &c. Sheets of "Mezzotile"—white enamelled zinc—are used for lining the walls and ceiling of the American bathroom, and have a smooth, hard, and clean surface, practically free from joints.

Messrs. W. Stevenson & Co., of Glasgow have a good display of brass, copper, and drawn-lead pipes at Stand No. 86, and at No. 87 the Bourtreehill Coal Company has a very good miscellaneous assortment of drain-pipes and traps, sinks, garden vases, terra-cotta statues, and other burnt-clay goods. Hutchison's patent drain-pipe has a double socket, the inner one being eccentric to the pipe and having the invert at such a level as to bring the invert of the spigot-pipe resting on it to exactly the same level as that of the socketed pipe. Peddie's "Special" drain-pipe has a large tapering socket, so designed that when the pipes are pushed home they are exactly concentric. The socket for a 4-in. pipe is 3 in. deep, 7¼ in. internal diameter at the outer end, and 5⅛ in. at the inner. Egg-shaped pipes are also shown. All the pipes are brushed over inside with some composition before firing in the salt-glazing kiln, the result being a greenish-yellow glaze of great smoothness. Among the other sanitary exhibits are the "Turret" and Fulton's grease-traps, Armstrong's "Tron" inspection-junctions, and white glazed manhole channels.

At No. 88 Mr. Wm. Sturrock, of Glasgow, shows manhole-covers, pipe-joints, gullies, &c., manufactured by the Ames Crosta Sanitary Engineering Company. Some good drain-pipes from 4 in. to 24 in. in diameter are shown at No. 89 by the Glenboig Union Fireclay Company, Limited; the pipes are of a dark purple-brown colour and are true in shape. The Gartcraig Fireclay Company has (among other goods at No. 90) a small exhibit of drain-pipes, and at the next stand Messrs. Peter & Mark Hurll show some drain-pipes, traps, and sinks of ordinary forms, and a fireclay siege-block for a plate-glass furnace, weighing 19¾ cwt., and said to be the largest solid block ever made in Great Britain. In the main avenue of the Industrial Hall two stands (Nos. 185 and 186) are occupied by exhibits of sheet-lead, lead pipes, &c., made by Messrs. Locke, Blackett, & Co. of Newcastle-on-Tyne, and Messrs. Alexander Fergusson & Co., of Glasgow, respectively; the latter firm has the more imposing display.

In the Machinery Hall one of the most important sanitary exhibits is that of Messrs. Mather & Platt, Limited, Manchester, at No. 610. Reeves's patent "single constant pressure filter" and "compound gravity filter" are shown, and are suitable for town and village supplies, and also for mansions and factories. The filtering material is pure quartz sand suitably graded, and simple arrangements are adopted for cleansing this. The gravity system is recommended for domestic purposes, and appears to have given good results at many places in this and other countries. A model of filter-beds for sewage with a special distributing apparatus is also shown. Other sanitary exhibits in the Machinery Hall which deserve at least passing mention are the following:—No. 431 (Messrs. Glenfield & Kennedy, Limited, Kilmarnock), penstocks and flap-valves for sewers, including a penstock for an oval sewer 36 in. by 24 in., with worm gearing and balance weight, and an ingenious apparatus for cleaning water-mains without disturbing the pipes except at certain points; No. 470 (Messrs. F. Braby & Co.), copper boilers, galvanised iron cisterns, &c.; No. 523 (Messrs. McDowall, Steven, & Co., Ltd., Glasgow), enamelled iron baths, porcelain lavatories, and glass-enamelled iron bends for drains; No. 527 (Messrs. Stewart & Menzies, Ltd., Glasgow), iron and steel pipes, and a 4-in. inscribed Roman seamed lead pipe of the first century with a joint like a modern copper-bit joint; No. 530 (Muntz Metal Co., Ltd., Birmingham), drawn copper, brass, and Muntz's metal tubes, coils, rods, bolts, &c.; No. 555 (Messrs. Thos. Bradford & Co., Manchester), laundry machinery and fittings for public and private laundries, and cooking and bathing appliances; No. 570 (Messrs. J. Stott & Co., Oldham), water-heaters for public and private baths; No. 584 (Messrs. D. & J. Tullis, Limited, Clydebank) and No. 601 (Mr. James Ritchie), laundry machinery and fittings of various kinds. At No. 519 Messrs. Walter Macfarlane & Co. have an excellent exhibit of glass-enamelled cast-iron drain-pipes and traps, all cut in half longitudinally and fitted together, so that the metal and glaze can be thoroughly examined. There is a 3-in. trap with junction and grate at one end of the drain, followed by a 3-in. to 4½-in. increasing pipe, after which 4½-in. pipes are fitted and three different traps of the same size, one of these being designed for a brick inspection chamber and another for fixing under an inspection cover in the iron drain. The metal is about ⅝ in. thick and is perfectly sound, and the glaze is smooth and flawless.

Stable fittings merit a short notice. Messrs. Walter Macfarlane & Co. show at stand No. 519 two stalls, one having blue-grey tiles at the head and the other sheet-iron enamelled to imitate marble. The fittings are of porcelain enamelled cast-iron, the drinking-trough in one stall being pivoted like a tip-up lavatory basin. The floor of one stall has an iron channel and grate of ordinary type, while the other has an iron floor-plate 5 in. wide with a groove ⅝ in. wide and about ⅛ in. deep along the middle. The "ornamental" cast-iron work in the upper part of one of the stalls, with a galloping horse in it, had better have been omitted, and would prejudice many persons against the work. This might have passed as artistic cast-iron work thirty years ago, but architects (and even some of their clients) have got beyond this kind of thing now. Plain but good workmanship is preferable to bad ornament, more especially in practical constructions of this class. The same firm has fitted up the stables and cowhouse in the Model Farm Buildings (No. 12) erected in the grounds by Messrs. Speirs & Co., of Glasgow; these are of a strong, plain character as befits their situation. At stand No. 523 in the Machinery Hall, Messrs. McDowall, Steven, & Co., Limited, Glasgow, exhibit a good range consisting of two stalls and a loose-box with porcelain-enamelled iron fittings (including tip-up drinking-trough), hard-grooved buff paving-bricks, iron floor-grates, and greenish-grey tiles at the heads of the stalls. At No. 80 in the Irish Pavilion Messrs. Musgrave & Co. exhibit a model of a range of three stalls and two loose boxes. The Carron Company's exhibit is No. 909 in the Lighting and Heating Pavilion, and includes two stalls paved with adamantine clinkers and iron floor-grates and channels; one stall is fitted with three porcelain enamelled iron pots with a polished bronze top and front roll in one piece. A silent tying chain is shown, the special feature being that the ring which slides up and down the metal rod fixed under the manger is of leather instead of metal. Teak boarding is used in one of the stall-divisions.

The Carron Company also exhibits at the same stand some cast-iron baths, porcelain enamelled and metallic enamelled, of good quality, but without any novel features. At No. 895, in the Lighting and Heating Pavilion, Messrs. Thos. Robertson & Co., of Glasgow, show their bath-heaters; these are rectangular, and therefore different from the usual type of geyser. In the same pavilion there are also several exhibits of gas water-heaters, including those of Messrs. Wilsons & Mathiesons, Dobbie, Forbes & Co., and Fletcher, Russell, & Co. On the second floor of the art galleries some of the exhibits illustrating "Technical Education" will be of interest to plumbers, showing what is being done by students in Glasgow and London.

BRITISH ASSOCIATION OF WATER-WORKS' ENGINEERS.

THE sixth annual conference of the British Association of Waterworks' Engineers has just been held in Birkenhead. The conference was to have spread over four days, the mornings of the first three being occupied with business and the discussion of papers, while the afternoons and the whole of the fourth day were to have been devoted to visits to various water pumping-stations and other places likely to interest the visitors. The headquarters of the Association were at the Birkenhead Town Hall. The members were received on the 9th inst. by the Mayor (Alderman Thomas Cook), who extended a cordial welcome to the visitors. The retiring President, Mr. C. H. Priestley (Cardiff), proposed a vote of thanks to the Mayor. Mr. Watts (Sheffield) seconded the motion, which was carried.

The retiring President then introduced the President-elect, Mr. W. A. Richardson, M.Inst.C.E., Waterworks Engineer to the Corporation of Birkenhead.

The new President, on taking the chair, thanked the Association for the honour conferred upon him, and moved a vote of thanks to Mr. Priestley for his services as President during the past year. This was seconded by Mr. Swindlehurst (Bolton) and adopted.

Mr. Priestley having responded, the President delivered an inaugural address, which embraced a detailed description of the waterworks of Birkenhead. He pointed out that Birkenhead is wholly dependent for its water supply upon deep wells sunk in the red sandstone of the district. There are five pumping-stations—Spring Hill, Flaybrick Hill, Borough-road, the Ford, and Mount-road. The last-named works are in progress, and pumping operations are about to be commenced to test the yield of the bore-hole. Spring Hill works were opened in 1841, and subsequently passed through the hands of the Birkenhead Improvement Commissioners to the Birkenhead Corporation, coming under the control of Mr. Richardson when he was appointed Water Engineer to the Corporation in December, 1881. At various dates the bore-holes were deepened, and now the yield is 8,500,000 gallons per week. There are seven shafts (six being 5 ft. diameter) and eight bore-holes from 3 in. to 18 in. diameter, the deepest being 678 ft. below the surface; and a covered service reservoir with a capacity of 800,000 gallons. The Flaybrick Hill works date from 1861, and in 1881 the yield was 14½ million gallons per week, but this by 1891 had decreased to 7,000,000. However, by sinking a borehole 700 ft., the yield had been increased to 8,000,000 gallons per week. At Flaybrick there is a large covered service reservoir, with a capacity of 4,562,600 gallons, and a 50 ft. tower and tank, the latter carrying 104,000 gallons. The Borough-road works also date from 1861, at which time Mr. Richardson was the resident engineer there. The original yield was 2½ million gallons per week, but by lowering the

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well from time to time the supply was increased to 10,000,000 gallons in 1893; but in 1897 the yield had fallen to 8,000,000, and at present is 6,000,000 gallons per week. There are here two covered reservoirs and a tank, with a total capacity of 1,557,242 gallons. The Ford borehole was completed in 1896, and an old horizontal engine and pumps working at full capacity yielded at the rate of 9,500,000 gallons per week, lowering the water 145 ft. Air-lift pumping plant in duplicate is being put in position, each set capable of lifting 45,000 gallons per hour, and the first set is expected to be at work in August. At Mount-road a borehole 850 ft. deep was completed last year, but the yield has not been ascertained. Birkenhead supplies a population of 108,721, with an average daily pumping over a period of ten years of 2,637,000 gallons. Wallasey supplies a population of 51,000, with 1,394,471 gallons; Hoylake and West Kirby a population of 12,000, with 386,300 gallons; Neston a population of 4,000, with 82,192 gallons; the Mersey Tunnel pumps 2,400,000 gallons (about one-third being fresh water); and the Wirral and West Cheshire Company supplies a population of 32,100, with 953,884 gallons. Thus within an area of 25,167 acres in that part of Wirral 207,800 people and all trade requirements are supplied with water pumped from the new red sandstone from the wells and boreholes at the rate of 7,853,840 gallons per day, or 54,976,880 gallons per week.—On the motion of Mr. Hamlet Roberts (Ipswich), seconded by Mr. Saintey (Windsor), a vote of thanks was accorded to the President for his address.

Messrs. W. J. Ware (Maidstone) and J. W. Lewis (Farnham) were elected auditors for the ensuing year, and the President announced the results of ballot for new members and associates.

Mr. W. E. Plummer, astronomer to the Mersey Docks and Harbour Board, then contributed a lecture on "Rainfall, the Cycle of Precipitation." A vote of thanks was passed to Mr. Plummer, on the proposition of the President, seconded by Mr. Whittaker (Croydon).

Subsequently the visitors were entertained by the Birkenhead Corporation Gas and Water Committee to luncheon, served in the Mayor's rooms.

During the afternoon the visitors were conveyed in waggonettes on a tour, which embraced visits to the Borough-road, Spring-hill, and the Flaybrick pumping stations. Leaving Flaybrick, the party visited Bidston Observatory, and then crossed the Wallasey Pool Bridge and inspected the Poulton and Liscard pumping stations of the Wallasey District Council, thence driving back to the Birkenhead Town Hall.

On the 10th inst., the first business was the reading of a paper by Mr. William Watts, M.Inst.M. and M.E., F.G.S. (Sheffield), on "Detecting and Preventing the Pollution of Public Water Supplies," which we print on this page.

The President opened a discussion on the paper, condemning iron pipes because of the corrosion which took place, and recommending the use of lead pipes for domestic supply. Mr. D. M. F. Gaskin (Liverpool) also condemned the use of iron pipes, observing, however, that water engineers ought not always to be judged by results, as in many cases they were bound to do what their corporations thought to be cheapest. Mr. Priestley (Cardiff) agreed generally with the paper, except as regards the use of iron pipes, believing lead pipes were better and safer. He said most towns were miserably provided with storage accommodation. Mr. Price (Worcester) urged that it would be cheaper to filter the water in the town rather than to buy up large areas of gathering ground, which might possibly be contaminated. Mr. C. E. Jones (Leyton, Essex) said it had been proved in the Thames Valley that flood water was not nearly so polluted as the normal flow, and, as for iron pipes, they were a nuisance in a thousand ways. Lead pipe with a tin lining was an ideal pipe for house service, but it was not popular on account of its expense.—Several others contributed to the discussion, general dissent being expressed to the use of iron pipes for house services.—In reply, Mr. Watts said he was not in favour of iron pipes if they could get a metal proof against the solvent power of water causing lead poisoning, and he hoped some such metal would be introduced.—On the motion of the President, seconded by Mr. Priestley (Cardiff), a hearty vote of thanks was accorded to Mr. Watts for his paper.

The conference would have been resumed on the 11th inst., but owing to the fire which occurred the previous night at the town-hall, it was decided to abandon the sitting. Before rising on Wednesday, Mr. William Ingham, Waterworks Engineer of Torquay, read a paper on "The Design, Construction, and Cost of Service Reservoirs," and the discussion upon this was adjourned and also the reading of a paper by Mr. A. G. Cloake, of London, on "The French Practice in the Manufacture of Cast-Iron Pipes."

Mr. Ingham, in the course of his paper, explained that he had been collecting the materials for it for some years. The chief points to be considered in connexion with the design of service reservoirs were: (1) the greatest daily variation in the supply; (2) the length of time necessary to repair any defect either in the trunk main, pumping engine, or other machinery between the storage reservoir or well and the service reservoir; (3) the maximum requirements in case of fire or the bursting of water pipes, as in 1895, due to frost; and (4) utilising the reservoir to equalise the variation due to intermittent pumping. Where there was only a single main for the storage to the service reservoir the latter should be large enough to supply the district for from three to four days—if in duplicate from one to two days' supply would be found sufficient. For pumping schemes where the machinery was duplicated a two days' supply was generally sufficient. The depth of the service reservoirs was generally between 9 ft. and 18 ft., the most economical depth, considering all things, probably being within the limits of 12 ft. and 14 ft. For covered reservoirs the economical depth to be excavated under the original surface of the ground might be taken at from 50 to 60 per cent., and for open ones at from 45 to 50 per cent. of the height of the wall. If the soil could be excavated by machinery it would pay to do it if the quantity exceeded 30,000 cubic yards, the cost then being from 9d. to 1s. per yard. Mr. Ingham proceeded to discuss the question of reservoir fittings and the materials used in constructing service reservoirs, and remarked that where coal, salt, or other mines were worked, special attention should be directed to possible disturbances due to their presence. The covering of reservoirs, he said, was a matter upon which there was much difference of opinion amongst engineers and the medical profession. Whether there was any necessity for covering them depended upon the character of the water and the purity of the atmosphere in the neighbourhood. Generally speaking, it would be found necessary to cover all reservoirs wherein hard waters were stored, but in some instances only where soft waters were stored, though in large manufacturing districts it might be necessary to cover them, whether the water be hard or soft. As to the cost, he submitted that circular reservoirs were from 20 to 40 per cent. cheaper than rectangular ones.

The members visited Warrington on the 11th inst., and inspected the Corporation waterworks at Winwick and Hill Cliff. They were driven to the two places, which are respectively on the north and south of the town, and were conducted over the works by Mr. James Deas, the Corporation Water Engineer. The Corporation are making a big extension in their waterworks system at a cost of 247,000*l*. The domestic supply is obtained at Winwick, and the new works there comprise an entirely new pumping station at Delph-lane. The water from the well will be lifted through one mile and a half of 20 in. cast-iron rising main to the Winwick reservoirs. The service reservoir accommodation is being increased by a new reservoir 215 ft. by 190 ft. and 20 ft. deep, with a capacity of 4½ million gallons. At Appleton, from which water is supplied for trade purposes, two new filters and a service reservoir are being constructed, and the existing filters will be reconstructed.

After inspecting the works the members proceeded to Norton Tower, which is 100 ft. high. The capacity of the tank is 600,000 gallons, and the weight when full is 3,000 tons. It is 82 ft. in diameter and 30 ft. 7 in. deep.

TRINITY CHURCH, WEST HAMPSTEAD.—A faculty will be issued from the Consistory Court of London for the building of a mission hall, having a capacity of 325 persons, upon a site adjoining that of the church, and for the placing in the church of a stained-glass window in memory of the Rev. Henry Sharpe, the late incumbent. The church was built in 1872-3 after Mr. Legg's plans and designs.

DETECTING AND PREVENTING THE POLLUTION OF PUBLIC WATER SUPPLIES.*

THE following remarks are intended to apply exclusively to water from moorland drainage areas, as the author considers this subject is sufficient in itself to furnish matter for one paper.

Public water supplies are often taken from sources where it is difficult to detect and prevent pollution, owing to the conflicting interests involved in the ownership of the property taken or affected.

Local authorities often select their sources of supply solely with a view to securing water at a cheap rate, and without much regard to the condition of the land through which it flows. It requires no little experience either to discover watersheds yielding water naturally wholesome and in sufficient quantity, or to deal with supplies which are contaminated.

Water may appear pure and bright and yet be objectionable for domestic uses. Too much care, therefore, cannot be taken in the selection of a drainage area from which domestic water supplies are intended to be drawn. Quality, rather than quantity, should be sought after, in which respect consumers would sooner learn the value of economy in the use of it.

The selection of water supplies generally should be left in the hands of trained engineers, chemists, and geologists, whose professional training qualifies them to give opinions based upon experience and free from local bias, and the selection of the site for works is generally safer left in such hands.

Pollution is a word often used in reference to water supplies, but its meaning has a wide range, because the elements of pollution have not been clearly defined by chemists and bacteriologists, nor understood by the public in general. Bacteria in water are looked upon as objectionable by some scientists and as an aid to purification by others, and while this doubt exists in the minds of specialists, the ordinary consumer will naturally be perplexed.

Water falling on the earth is not chemically pure, and it is questionable whether absolutely pure water is more wholesome than a well-guarded mountain stream containing the impurities common to this class of water. The fouling of moorland waters by ordinary denudation can be prevented by the adoption of the methods described in this paper, and which for many years the author has adopted on the works entrusted to him.

The purity of moorland water can be maintained to some extent by keeping up a constant change and circulation in the supply reservoir. The in- and out- flows require to be evenly balanced, and the water should not be allowed to remain too long at one level, but should be lowered and raised as frequently as possible, especially in the spring of the year, when it swarms with the lower forms of aquatic life. The ova at this time deposited on the sides of the reservoirs are destroyed, together with the vegetation which finds shelter and support in the shallow water Exposure and change bleach discoloured water, and frequent decanting is generally beneficial. The water stagnant in the bottom of a reservoir does not appear to rise to the surface, and thus the benefits of oxidation and purification by exposure are lost; and such water should never be used for domestic supply, but be drawn from as freely as possible when in wet seasons the supply is plentiful, and be given as compensation water. It frequently happens, especially in new reservoirs, that water drawn from the higher level is clear and inodorous, whilst the bottom valve is discharging water offensive both to smell and taste. Too much importance cannot, therefore, be attached to the placing of draw-off valves at different levels in the valve well. Purification begins at the surface, and much time is required for the suspended matter to pass through the lower layers of water and reach the bottom.

Flood water should not be allowed to enter a reservoir from which the supply goes direct to the consumer, unless it be subsequently filtered. Even then it is better to keep it out and supply water derived only from the streams in a normal condition of flow; the flood water being collected and stored in a separate reservoir, whence it can be drawn off when sufficiently clarified. This

* A paper read by Mr. William Watts, M.Inst.M. and M.E., at the recent meeting of the British Association of Waterworks Engineers at Birkenhead.

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method, besides providing a purer and greater supply of water, enables the suspended matter to be deposited where it can be removed without interfering directly with the town supply. Heavy floods do not occur more than two or three times a year, and seldom last long. While the volume discharged is great, flood water is not necessarily the most dangerous water flowing from a drainage area. Unless flood-water courses be provided, separation is impossible; moreover, if flood-water is allowed to enter a reservoir at the head of the works, it has a tendency to drive the clean water over the waste weir.

Of course, land drains connected with dwelling-houses and farm buildings should not be allowed to discharge into the lateral feeders of a reservoir; and when the physical features of the land do not admit of a system of drainage being carried out, intercepting wells or cesspits should be constructed so as to arrest the sewage, which should thence be regularly carted away from the drainage area, or be spread on permeable substrata, where it would be effectually filtered and rendered harmless. The safest plan, however, is to purchase the drainage area, and remove all possible sources of contamination.

Some reservoirs are, in a measure, protected by the reservation of a narrow strip of land between the top-water level and any adjacent fields likely to be manured. Manure so placed upon land is, however, liable to be washed off, and so get into the reservoir during heavy rain, especially in frosty weather, and where the ground slopes steeply towards the reservoir. Attention should also be given to the land drains discharging into the streams which feed the reservoir, which naturally occupies the lowest position in the valley.

Water plants should not be allowed to grow in the shallow margins of a reservoir, and constant weeding is necessary in the spring of the year to keep them down. To prevent and to further check their growth the sides should be pitched with stone, and the water drawn down as frequently as possible, in order to destroy the roots as well as any ova deposited upon the vegetation and stone pitching.

The shallows of a reservoir afford suitable spawning ground for frogs, which, with the opening of spring, appear in great numbers, and render the appearance of the water very offensive. This spawn should be collected as soon as it appears, and be buried in lime and soil some distance away. Frogs are not found in deep water or running streams.

Fish should not be allowed to multiply too freely, and care should be taken to exclude all but the cleaner kinds, of which *Salmo fario* are the best, but unless they have a running stream in which to spawn, they do not thrive or multiply, and when confined too long in deep water they grow lank and sometimes become blind. *Fario* will not live long either in a reservoir set apart for the storage of flood water, or of water selected in the manner suggested, as the flood supplies are intermittent. Fish act simply as scavengers, and as such their presence in reservoirs is beneficial, but they do not otherwise purify the water. They, no doubt, devour the ova and larvæ, and many forms of life which exist in water, and the objectionable "limnæ," found in some reservoirs, are reduced by them, and it is also alleged that fish destroy the "cyclops," but the evidence on this point is not well authenticated. In the author's opinion, these crustaceans are too small for fish to notice as food unless their powers of sight are exceptional; these "cyclops," moreover, are harmless, and probably even more beneficial to the water than the fish, as they feed on the minute organisms which are known to carry infection to the consumers. On the other hand, it may be, generally speaking, taken for granted that the fewer the forms of life in water the purer it is; but whether it is therefore more wholesome is an open question.

Trees, although objects of beauty in a landscape, are not always desirable. They prevent evaporation and a free flow of water off the land, and consequently springs are more abundant where forests exist. They should not be allowed to remain where falling leaves can find their way into drinking water; in fact, vegetable matter of every kind should be kept out of streams and reservoirs used for domestic supplies. Such vegetable matter may not be actually unwholesome in itself, but as it provides food and shelter for aquatic life which is objectionable, it is better kept out of the water.

The sources of pollution hitherto referred to may be prevented either by the purchase of the gathering ground, by the proper construction and arrangement of the works, or by good management; but pollution, which it is not easy to detect or remove, is sometimes found to exist on a watershed—such as that occasioned by denuding agencies, and the erosion of the exposed surface of the land, by the solvent power of the water, by objectionable mineral springs, the decay of vegetation, road washings, and matter from dwellings, which cannot very well be removed. By purchasing the drainage area some of these sources of contamination may be removed, and others rendered less injurious; but pollution of some kind will nearly always exist in spite of every reasonable precaution.

The purity of moorland water depends very much upon the character of the streams from which it is derived or conveyed to the reservoirs, and to prevent disintegration the main feeders should be pitched with rubble stone, and the adjacent springs and swampy ground be drained direct into them. Water from peat beds is also very much improved by draining, especially those higher areas from which most of the water is derived. A few leading drains will suffice if opened out and carried deep enough in the right direction. Where stone is not available, open cuttings answer very well, but in a spongy sub-soil the sides require support and protection.

Intercepting or wreck lodges placed across a stream will arrest coarse *débris*, and prevent much silting up of the reservoir. These require cleaning out from time to time when dry weather permits. All that is required is a strong rubble embankment, with a draw-off pipe at the bottom, and a by-pass to be used while the cleaning out is in progress; they need not be watertight, or deeper than from 6 ft. to 9 ft., but the level of the streams will in all cases determine the depth. The author has made many with complete success, and can testify to their value.

The collecting and storing of a town's water supply should be carefully attended to at its very source, whether it be afterwards filtered or not. The streams, drains, and springs are too often neglected, and because of their distance away are visited only at long intervals. Floods sometimes bring down dead sheep, roots and branches of trees, bracken and tufts of hay, all of which are liable to block up the stream in narrow places. To guard against this the principal feeders should be examined directly after a flood, and every obstruction removed. In pitching the drains and feeders, care should be taken to improve their lines as far as possible, and to keep the sections proportionate to the quantity of water they have to carry. This enables it to flow to the reservoir much quicker than otherwise, and it is a decided advantage when, in hot weather, the flow is reduced.

With regard to the action upon lead of certain waters, several methods for preventing this have been suggested, but no effective plan, has, so far, been introduced whereby the acidity of the water is entirely removed so as to satisfy engineers and chemists. Peaty water does not of itself appear to be injurious to health, but the acid it contains acts powerfully upon lead, and may dissolve sufficient to cause lead-poisoning. The remedy which finds most favour with engineers is to pass the water through a layer of chalk or limestone chippings, placed among the coarser material of the filters below the sand. Soft water when brought into contact with limestone liberates carbonic acid gas and causes a deposit of carbonate of lime to form on the surface of the lead, which prevents any further solvent action taking place; but whether this coating is sufficient permanently to resist the action for all time it is impossible to say, and it is obvious that if this coating goes on accumulating, the pipes must become seriously reduced in size.

There is a need for a metallic service pipe which, while equal to lead in ductility and strength, would have, in addition, the power of resisting the solvent action of water charged with peaty and other acids. New piping is more readily acted upon than old, and probably a baser metal than lead—if one can be discovered—is all that is required.

In recent years iron piping has come into more general use, and there is no reason why it should not be even more extensively used, as there is no doubt but that lead pipes and cisterns are dangerous to health when used in the storage or conveyance of soft water.

The time has arrived when spun yarn should cease to be used in making the joints of socket pipes, and cold lead rings substituted. The fibre of the yarn is vegetable material, and in the course of time decays and pollutes the water. Some engineers have dispensed with it, and I see no reason why others should not do likewise. The cost of solid lead joints is a little more than a yarn and lead joint, and the surface of lead brought in contact with the water can be reduced to a minimum. It has occurred to the author that these cold lead rings could be forced in by hydraulic power, and thus save the expense of firing, making joint holes, and setting-up, as in the case of molten lead joints; the sockets could be shortened, and the amount of lead required reduced.

The standardising of pipe sockets, too, is a thing greatly needed, and which would simplify and probably cheapen the manufacture of pipes generally.

No water supply from such sources as have been indicated can be considered as sufficiently pure for domestic use unless it is filtered immediately before it passes into the supply mains, for while it may be potable and wholesome without filtration where arrangements exist for effective decanting, yet cyclops and other low forms of life are liable to go with the water into the mains, and thus find their way to the consumers.

Screening the water through fine gauze is sometimes substituted for filtration, but it is neither satisfactory or so effective as the latter.

The deposition of sediment in the supply mains is also a common cause of complaint, and is intensified every time the water is turned off. Even in the best supplies of filtered water, fine sediment will accumulate in the pipes, and is not all due to the matter in suspension in the water, but partially to peroxide of iron from the metal of the pipes, and is deposited in the form of barnacles, especially when the water is often withdrawn or air gets to them. To remove this, more frequent flushing of the mains is required, the velocity of the water being such as to give an effective scour in the pipes. The districts of supply should not be too large, and although they may be supplied from one common source, each should work independently. Dead ends should not be allowed, and complete circulation of the water should be ensured, as it is not improved by being kept too long in the mains, whereby the benefit of oxygenation is lost.

The author trusts the subject of the pollution of supplies from wells and other sources will be brought before the Association upon a future occasion, so as to make the subject more complete.

A NEW TEST FOR THE FINENESS OF CEMENT.

CEMENT is a material of so much importance to the architect and the engineer that the cost and trouble involved in systematic testing is amply repaid by the knowledge thereby obtained. It is generally admitted that the improvement of quality evidenced during recent years has been largely due to the pressure exerted upon manufacturers as a result of the information acquired in testing operations. Various properties must form the subject of examination if the constructive value of a cement is to be reliably determined. These properties are (1) colour, (2) completeness of burning, (3) activity, (4) soundness, (5) fineness, (6) strength. The new form of test now to be mentioned is connected only with the property of fineness, which is almost entirely a matter of economy. Much of the improvement in the quality of cement during the last decade has resulted from the discovery that the coarse particles have no setting power whatever, and, indeed, for practical purposes they may be regarded as so much sand. This circumstance escaped observation for a long time because tests of strength were nearly always made with neat cement, which, if of good quality, will permit the addition of a certain proportion of inert matter without noticeable loss of strength. Ultimately, when the practice was adopted in Germany of testing cement mixed with sand in the proportion used in practice, it was seen that finely-ground samples exhibited considerable advantage over those less carefully prepared. Hitherto, it has been usual to ascertain the degree of fineness by weighing the percentage of cement incapable of passing through

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sieves with a specified number of meshes to the square inch. Formerly a cement was regarded as finely ground if the residue on a 50-sieve was within 10 per cent., but it is now frequently demanded that the residue shall not exceed 5 per cent. of the original quantity. It would, of course, be possible to pursue the practice of grinding until the material became reduced to the condition of an impalpable powder. In such a case the cost of grinding would be prohibitive, and it may be said that the practical limit is reached when the cost of using a larger proportion of cement is less than that of additional grinding.

The essential thing is to know accurately what percentage of the material possesses actual cementitious value, and it is for this class of enquiry that a new form of testing apparatus—known as the Goreham Flourometer—has recently been devised. This appliance is extremely simple in construction, consisting of four parts :—(1) A conical glass into which the sample of cement is placed ; (2) a brass tube having a serrated end passing through the cement, and resting on the bottom of the glass ; (3) a sheet metal tube to whose lower end the test glass is secured by suitable clamps and whose upper end has an air-tight cap through which passes the top of the brass tube, whilst from the upper portion of the tube a branch pipe of equal diameter projects downwards at an acute angle ; and (4) a cylindrical settling chamber, receiving the branch pipe through its side. The settling chamber is covered by a closely fitting lid, and all the joints of the apparatus are made air-tight. In addition to the above-mentioned parts, an aërometer is generally employed for the provision of air at a definite pressure, the air being conveyed from the aërometer to the brass tube by means of an india-rubber pipe.

The method followed in the course of a test is also very simple. In the first place, a weighed sample of the material to be tested is placed in the glass vessel, which is then clamped to the end of the metal tube ; a stop-cock on the air tube is next opened, and as air issues from the serrations of the brass tube it carries away the impalpable portion of the cement, which passes up the sheet metal tube and through the branch pipe into the settling cylinder. When no more cement flour is given off, or after the lapse of a specified time, the glass is removed and the residue is weighed. It is then quite easy to determine the proportion of active material taken over by the air. Mr. Goreham, the inventor, states that he has made a number of tests with different samples of commercial cement, and in these the proportion of flour was found to vary from 20 to 50 per cent., the residuum being therefore from 80 to 50 per cent. In a sieve test the proportion of comparatively fine material passing the meshes would, of course, be much greater, but it is worthy of note that when samples of the same cements were thus tested for the purpose of comparison, the variation was not more than 1 per cent. Although we are not able to verify these statements from personal experience, we have examined the working of the apparatus itself, and believe it is fully capable of doing all that is claimed for it by the inventor.

As we have previously remarked, the condition of fineness is almost entirely a matter of economy. This is especially the case in undertakings where cement has to be transported considerable distances, for no one can desire to pay freight on 80 per cent., or even on 50 per cent., of inert material. Sometimes it may be that the cost of extra grinding will exceed that of freight, but even then the Flourometer test is equally important, for the architect or engineer responsible for the stability and strength of the works under his charge must be exactly acquainted with the value of the cement, if he is to determine the proper proportion of sand or other diluting material with any degree of confidence. The Flourometer test for fineness is not intended to supersede recognised tests for other properties of cement, but so far as it can be expected to extend we believe it will be found in every way reliable.

WESLEYAN INFANT SCHOOL, TONBRIDGE.—The memorial stones have just been laid of a new Wesleyan infant school in Danvers-road, Bardenroad, Tonbridge. The contract for the building is 1,075*l.*, and the work is being carried out by Messrs. Martin & Co. The building, which was planned by Mr. John Fagg, consists of a room measuring 46 ft. by 24 ft., a classroom, entrance hall, and cloakroom. It provides accommodation for 157 scholars

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 990*l.* for contributions to street improvements and 10,065*l.* towards electric lighting purposes ; Hampstead Borough Council, 88,579*l.* to repay a loan for electric lighting and 27,897*l.* to repay a loan for wood-paving ; Southwark Borough Council, 2,500*l.* towards the cost of acquiring an extension of Brockwell Park ; Wandsworth Borough Council, 4,000*l.* for wood-paving works and 1,300*l.* for pipe sewer works ; Woolwich Borough Council, 1,270*l.* for paving works ; Stepney Borough Council, 18,703*l.* for an electric light installation ; Hampstead Borough Council, 3,865*l.* for wood-paving works ; Camberwell Guardians, 4,000*l.* for the erection of a relief station and 3,320*l.* for purchase of premises ; Hampstead Guardians, 3,375*l.* for various purposes ; and St. George's Guardians, 14,040*l.* for the erection of homes for children.

Theatres, &c.—The following applications were agreed to :—The conversion of a room situated on the roof of the Frascati Restaurant, Oxford-street, formerly used as a carpenter's shop, into lavatories and ladies' cloakroom (Mr. C. H. Worley).

Windows in the stage roof of the Hackney Empire, Mare-street, Hackney (Mr. F. Matcham).

An arrangement of the electric lighting circuits at the St. Pancras Baths, Prince of Wales-road, Kentish Town (Messrs. Dolby & Williamson).

Alterations proposed to be made to the St. Peter's Institute, Buckingham Palace-road, with a view to rendering the premises suitable for a music and dancing licence (Messrs. Chambers & Son).

District Surveyor for North Battersea.—The Building Act Committee recommended—

"That consent be given to Mr. H. J. Hansom, the District Surveyor under the London Building Act, 1894, for the district of North Battersea, appointing as his deputy Mr. R. D Hansom, of No. 8, College-gardens, Dulwich, to perform all the duties of such district surveyor, as from July 11, 1901, during the pleasure of the Council ; such consent being subject to the condition that Mr. H. J. Hansom shall not, without the previous consent of the Council to be signified in writing under the hand of the clerk of the Council, act as district surveyor or revoke the appointment of Mr. R. D. Hansom as such deputy, or in any way interfere with the performance by Mr. R. D. Hansom of his said duties."

Mr. Radford moved to refer the recommendation back. He thought that some other arrangement should be made.

Mr. J. Burns, M.P., seconded, and the Chairman of the Committee agreed to take the paragraph back.

The Chief Assistant Architect.—The Establishment Committee recommended, and it was agreed—

"That a retiring allowance . . . be granted to Mr. John Hebb, the Chief Assistant Architect, as from August 20, 1901."

The Architect's Department.—The same Committee recommended :—

"(*a*) That Mr. J Briggs be promoted to the position of Chief Assistant Architect. . . .

(*b*) That Mr. F. S. Capon be appointed Assistant Architect. . . .

(*c*) That Mr. R. Robertson be promoted to the position of Assistant Architect. . . .

(*d*) That Mr. R. M. Taylor be promoted out of the first class to the position of unclassified officer. . . .

(*e*) That the above resolutions (*a*) to (*d*) inclusive do take effect as from August 20, 1901.

(*f*) That authority be given for the appointment in the Architect's Department of an additional assistant in the first class at the commencing salary of 200*l.* a year."

The recommendations were agreed to.

Paving Works, Millbank Estate.—On the recommendation of the Housing of the Working Classes Committee, it was agreed—

"That the plans, specification, and bills of quantities for the paving with York stone of the footways and with asphalt of the roadways of Herrick and Erasmus streets and portions of Dundonald, Bullinga, Earl, and Atterbury streets, on the Millbank Estate, be approved ; that the work be carried out by the Council without the intervention of a contractor ; and that the plans, specification, quantities, and estimate of 12,700*l.* be referred to the manager of works for that purpose."

Street Improvement.—The Improvements Committee recommended, and it was agreed, that a final payment of 1,686*l.* be made to the Carpenter's-road Improvement Committee, in respect of the contribution promised by the Council on March 14, 1899, towards the cost of the widening of White Post-lane and the reconstruction of White Post-lane Bridge.

Subways.—Replying to questions, Mr. Benn said that the provision of subways under the streets was under the consideration of the committee, but at present there was no power to compel the Post Office, telephone companies, and others to place their mains in the subways. They would consider the question of applying to Parliament for powers to compel the companies to use the subways. There were subways in Queen Victoria-street, but the Post Office authorities chose to tear up that street instead of using the subways.

Richmond-hill.—Replying to Mr. Burns, M.P., Lord Monkswell said he had seen the owner of the property at Richmond-hill, who met him in a very friendly spirit, and he would have several proposals to make to a conference to be held on Friday.

The Council adjourned about half-past seven o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage and Projections.

Clapham.—Retention of a wood, tile, and brick verandah in front of a detached dwelling-house on the east side of Thurleigh-road, Wandsworth Common, southward of Ramsden-road (Mr. H. Bignold for Mr. S. J. Tavener).—Consent.

Clapham.—Retention of an iron and glass covered way on the forecourt of No. 2, Ravenslea-road, Wandsworth Common (Mr. A. Boon).—Consent.

Greenwich.—A one-story addition to the Electric Cable Works, Victoria-road, Charlton (Messrs. Johnson & Phillips).—Consent.

Hackney, North.—Houses on the east side of Mount Pleasant-lane, Upper Clapton, between Baker's-hill and No. 121, Mount Pleasant-lane (Mr. G. R. Woodruff).—Consent.

Hampstead.—Porches, with bay windows over, in front of Nos. 3, 5, and 7, Clorane-gardens, Platts-lane, Hampstead (Mr. R. W. Hart).—Consent.

Lewisham.†—Four houses, with one-story shops in front, upon part of the site of The Priory, High-street, Lewisham (Messrs. Norfolk & Prior for Mr. C. C. Story).—Consent.

Lewisham.—An iron and glass hood over the entrance to No. 5, St. Mildred's-road, Lee (the St. Pancras Iron Work Company, Limited, for Mr. W. Cordrey).—Consent.

Lewisham.—A wood and tile pent at the entrance to a dwelling-house on the west side of Blagdon-street, Lewisham, northward of Medusa-road (Mr. E. West).—Consent.

Islington, East.—That the Council do not accede to the request of Mr. J. R. Quilter, for Mr. T. Lee, for permission to retain the two show-cases on the pilasters of Nos. 412 and 414, Holloway-road, Islington.—Agreed.

Hammersmith.—A house on the west side of Paddenswick-road, Hammersmith, adjoining Ravenscourt-park (Mr. L. Lickis for Mr. J. W. Lickis).—Refused.

Fulham.—A shop front, with projecting roof and facia, in front of No. 141, Greyhound-road, Fulham (Mr. E. Avern for Messrs. S. Langston & Sons).—Refused.

Lewisham.—Three one-story shops on the north side of Stanstead-road, Forest Hill, westward of No. 129 (Mr. R. E. Crossland for Mr. E. Paul).—Refused.

Peckham.—A one-story shop on part of the forecourt of No. 24, Gibbon-road, Nunhead (Mr. J. Sykes for the trustees of the late Mr. W. Beasley).—Refused.

Strand.—The retention of a projecting signboard in front of the Windsor public-house, No. 427, Strand (Messrs. J. & H. Cocks, Limited, for Messrs. Worthington & Co.).—Refused.

Strand.—A wrought-iron and copper trade sign to project from the *Building News* newspaper office, on the east side of Clare-market, Strand (Mr. M. B. Adams for the Strand Newspaper Company).—Refused.

Strand.—That the Council do not accede to the request of Mr. J. E. Chevers, for permission to retain an iron and glass projecting sign at the first-

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floor level in front of the Savoy Palace public-house, Savoy-street, Strand.—Agreed.

Strand.—That the Council do not accede to the request of Messrs. Wylson & Long, for Messrs. Antiss & Sons, for permission to retain a projecting illuminated sign at the third-floor level in front of No. 45, Strand.—Agreed.

Wandsworth.—A one-story shop and gateway entrance, northward of No. 3, Sunnyhill-road, Wandsworth (Mr. C. M. Quilter for Messrs. Dowsett & Jenkins).—Refused.

Westminster.—Iron and glass inclosures to a portion of a covered way in front of No. 24, Albert-gate, Hyde Park (Messrs. Colls & Sons for Mr. C. Jacoby).—Refused.

Width of Way.

Finsbury, Central.—A building on the east side of St. John's-lane, Clerkenwell (Mr. C. R. Baker King for the Grand Priory of the Order of St. John of Jerusalem in England).—Consent.

Kennington.—A staircase at Cumberland Works, Wigton-place, Milverton-street, Kennington (Mr. A. Parnacott for Messrs. T. & W. Judge).—Consent.

Poplar.—The retention of a one-story workshop on the north side of Wharf-road, Millwall, Poplar (Mr. A. G. Langdon for Messrs. J. Fraser & Son).—Consent.

Woolwich.—A greenhouse at the rear of No. 225, Burrage-road, Woolwich, and the retention of the boundary fence in front of such greenhouse, at less than the prescribed distance from the centre of Church-passage (Messrs. Church, Quick, and Whincop for Mr. H. W. Kier).—Consent.

Hammersmith.—A shed in the garden at the rear of No. 1, Applegarth-road, Brook-green, Hammersmith, with the boundary fence in front of such shed at less than the prescribed distance from the centre of Augustin-road (Mr. E. J. Wilson for Mr. E. F. Bowen).—Consent.

Hackney, South.—The rebuilding of Nos. 56, 58, and 60, High-street, and No. 1, Bridge-street, Homerton, at less than the prescribed distance from the respective centres of those streets (Mr. J. Hamilton for Mr. W. E. Stevens).—Refused.

Whitechapel.—A warehouse building and the retention of a boundary fence at less than the prescribed distance from the centre of Vine-court, Whitechapel-road, Whitechapel (Mr. J. R. Smith for Mr. A. W. Brown).—Refused.

Width of Way, Lines of Frontage, and Projections.

Bethnal Green, North-East.—That the application of Messrs. Francis & Calley, for an extension of the periods within which the erection of buildings on the site of the Arabian Arms public-house, Nos. 222 to 232 (even numbers only), Cambridge-road, and Nos. 2, 4, 6, and 8, Bishop's-road, Bethnal Green, was required to be commenced and completed, be granted.—Agreed.

Limehouse.—A building on the site of Nos. 680, 680A, and 680B, Commercial-road East, and Nos. 3 and 5, Gill-street, Limehouse, at less than the prescribed distance from the centre of Gill-street, and with two projecting turrets and an oriel window next Commercial-road East (Messrs. Niven & Wigglesworth for Mr. A. Scrutton, Mr. T. Mason, and the Rev. E. W. Matthews).—Consent.

Southwark, West.—A steel and concrete gangway across New Park-street, Southwark, to form an approach from Southwark Bridge-road to buildings proposed to be erected on the west side of New Park-street (Messrs. Hubbard & Moore for Mr. H. Ward).—Consent.

Clapham.—A fire brigade station on the east side of Old Town, Clapham, to abut also upon Grafton-square (Mr. O. Fleming for the Fire Brigade Committee of the Council).—Consent.

St. George, Hanover-square.—An iron and glass shelter at the entrance to the Bath Club, No. 16, Berkeley-street, St. George, Hanover-square (the Right Hon. Herbert J. Gladstone for the Bath Club Company).—Refused.

Bermondsey.—A one-story shop on part of the forecourt of No. 127, Long-lane, Bermondsey, at the corner of Kipling-street (Messrs. Barnes-Williams, Ford, & Griffin for Mr. P. Tyrer).—Refused.

Deptford.—A one-story shed on the west side of Charles-street, Deptford (Mr. S. E. Musgrove).—Refused.

Space at Rear.

Fulham.—An addition on a portion of the open space at the rear of No. 331, Lillie-road (Mr. G. Trotman for Mr. D. Thompson.—Consent.

Camberwell, North.—A three-story dwelling-house, adapted to be inhabited by persons of the working-class, on the east side of Crown-street, Wyndham-road, Camberwell (Mr. E. J. Strevens for Mr. R. Knight).—Refused.

Hammersmith.—A block of flats on the west side of Queen-street, Hammersmith, at the corner of Sussex-place (Mr. H. G. Brace for Mr. E. Messiter).—Refused.

Wandsworth.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of four blocks of two-story residential flats on the south side of Coverton-road, Tooting, without an open space at the rear, and of a fifth block at the corner of Condy-road, with an irregular open space at the rear (Mr. W. C. Poole for Mr. A. Heaver.—Refused.

Formation of Streets.

Lewisham.—That an order be issued to Messrs. H. and G. Taylor and Mrs. M. A. Clark sanctioning the formation or laying out of new streets for carriage traffic out of Laleham-road, Catford, on the site of the Catford Sports Ground.—Agreed.

Woolwich.—That an order be issued to Messrs. Farebrother, Ellis & Co., sanctioning the formation or laying out of two new streets for carriage traffic on the Bowater estate, Trinity-street, Woolwich-road, Woolwich, for the trustees of the Bowater estate). That the names Yateley-street (in continuation) and Westfield-street be approved for the new streets.—Agreed.

Lewisham †—That an order be issued to Mr. W. H. Dawson, refusing to sanction the formation or laying out of new streets for carriage traffic on part of the Forster estate, on the east side of Bromley-road, Catford, at the corner of Sangley-lane (for Mr. H. W. Forster.)—Agreed.

Lewisham.†—That an order be issued to Mr. G. F. Logsdail, refusing to sanction the formation or laying out of a new street for carriage traffic out of the west side of Torridon-road, Hither Green, on the St. Germans estate (for Mr. A. Cameron Corbett, M.P.)—Agreed.

Buildings for the Supply of Electricity.

Hoxton.—A steel framed tower, to be used as a coal elevator (Messrs. Kincaid, Waller & Manville, for the Council of the Metropolitan Borough of Shoreditch).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

Books.

Hints to Young Valuers: a Practical Treatise on the Valuation of Property. By ANTHONY RICHARD CRAGGS, assisted by J. R. V. MARCHANT, Barrister. Second Edition. London: The Land Agents' Record, Limited. 1901.

WE are glad to find that the title of this voluminous volume of 1,074 pages has not been altered, because, important and almost indispensable as this work is, it is yet primarily a work rather for young practitioners than for those who have gained much experience in their profession. On the other hand, the title scarcely does justice to the immense quantity of ground covered by this volume. It is far more than a guide-book for valuations. It is rather in the nature of a handy encyclopædia, dealing with a variety of subjects which fall within the professional work of a land agent, a surveyor, or an architect. The new chapter, for example, on building contracts, which contains an excellent but somewhat too short sketch of the subject, has nothing to do with valuations; and of that on the power of sanitary authorities as to sewers, streets, and buildings the same may be said. We consider, however, that the authors do well to add these and other chapters, because they now place in the hand of every professional man a work of more general usefulness than one on valuation alone could be.

An important new chapter is that devoted to the subject of artificers' work on new erections, adjustment of builders' accounts, restorations, alterations, and repair of buildings. "The valuation of buildings and builders' works is work which frequently claims the attention of the valuer, and therefore it has been thought advisable to treat the subject separately. Such work is often of much importance, and it is frequently of a very complex character. It needs a practical knowledge of almost every class of material and workmanship required in connexion with the erection or upholding of buildings under a variety of conditions." We entirely agree with all this, but we are irresistibly reminded of what Bacon said of himself, that he took all knowledge for his province.

The valuer would seem to be a person who possesses a vast and accurate knowledge of the business of a number of professions. There are few architects who would care to stake their reputation on an accurate valuation of the details of buildings, such work being rather that of a quantity surveyor, for in the chapter to which reference is now being made the work there indicated is that of a quantity surveyor. This fact does not take away from the value of this portion of the book, but it suggests that the young valuer, if he has to go into questions of quantities, would do well to engage the services of one whose profession it is to take out quantities. If, on the other hand, he is to make an estimate of the value of a building, larger views must necessarily be taken than those which would commend themselves to a person taking out quantities, although some general knowledge as to the original cost of a building may doubtless be desirable. Included in this chapter are the regulations issued by the Manchester Society of Architects for the guidance of practitioners in the preparation of bills of quantities, with notes showing any differences between the Manchester and the London practice. We are of opinion that the code, with its notes, would have been more appropriately placed in the appendix.

In the chapter on fixtures the Luton Hoo tapestry case is placed in a preliminary errata, but apart from that case we are inclined to think that the authors take too pessimistic a view of legal decisions from the point of view of the executor. "The tendency of the Courts has been to prefer the heir to the executor." This statement seems to be rather too broadly put. In another edition it would be desirable to lay down the principles which certainly now govern ornamental fixtures, namely, that such things as are not, so to say, incorporated with the building, belong not to the heir, but to the executor. Certainly the Luton Hoo case must be considered, as pointed out previously in our columns, to have liberalised the law on this point.

In the chapter on the conduct of an arbitration, we wish the authors had said something on the expensive and unbusinesslike practice of arbitrators practically acting as advocates, the umpire being the real judge. "A convenient course," it is said, "to save expense is for the umpire to sit with the arbitrators and hear the evidence with them, and give his decision if the arbitrators disagree." In other words, the umpire is to be called in not when, but before, the arbitrators disagree. In our opinion, the appointment of two arbitrators is altogether wrong. It is much more economical and much more satisfactory to refer a dispute to one competent person. When two are appointed, a decision is often a matter of compromise, which might have been attained without the cost of an arbitration. Where there is one arbitrator only, the sense of responsibility is also greater, and the business is frequently carried through with much greater expedition.

We have sufficiently indicated in what manner this work has been enlarged, and what its general character now is. So comprehensive a volume necessarily has its shortcomings, but as it is, it appears to be one of the most useful books that can be found on the practitioner's shelves. There is a great convenience in having in a book, which, though not very large, contains a general mass of information on nearly every point which concerns the architect and surveyor, whether, for the time being, he is or is not a valuer. For, after all, the valuation of property for any purpose is but a limited part of the surveyor's business, and must always be based, to a very great degree, on an almost intuitive power of forming an opinion on a number of often conflicting elements.

Designing Ironwork. Second series. Part II. By HENRY ADAMS, M.Inst., C.E., M.I.Mech.E., F.S.I. Published by the Author. London. 1901.

THIS pamphlet contains notes, formulæ and calculations, and working drawings for a built-up detached steel stanchion, 30 ft. high, to carry a dead load of sixty tons. At the outset, the author points out that a difficulty arises in designing a stanchion or other compression member, that does not occur in connexion with other parts of a structure. As he says, "We cannot by a single calculation proportion the sectional area to the load by taking a factor of safety upon the ultimate strength," for if the length and load be already settled, as is usually the case, the diameter and sectional area have to be determined together with the form of the cross section, and the latter depends upon the proportional dimensions of the member. Moreover, the safe stress intensity cannot be decided unless the ratio of length to diameter is known, and the diameter is governed by the sectional area necessary to provide for the safe stress intensity. Before proceeding to show how the difficulties engendered by this series of complications may best be overcome, Professor Adams gives some brief notes upon various forms of section, rivets, and strength of material. These remarks are concise and useful as far as

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they go, but readers of the student class should certainly supplement the information they convey by the aid of a suitable treatise. Coming next to a consideration of the difficulties mentioned above, the author suggests a solution by the process of "trial and error," expediting the operation by using an approximate formula for safe load on an assumed diameter. In an example of this method an approximate sectional area is settled by the assistance of the approximation mentioned and Gordon's formula is applied to test the sufficiency of the proposed section, with the result that it is shown to be inadequate. An increase of the section appears to be unsatisfactory, but further consideration is deferred until the reader has followed the calculation of strength by some fourteen different rules. All these give extremely diversified results, and Fidler's formula is next explained, this equation being recommended, as the most reliable one available at the present day, for the purpose of checking the approximate sectional area and the calculation of strength by Gordon's rule. If the application of Fidler's formula should reveal deficiency of strength the area of the stanchion is to be increased until correct proportions are attained. The mode of procedure recommended by the author can readily be followed, even by those having little knowledge of mathematics, but it is necessarily rather tedious and lacking in scientific precision. We do not wish to imply that Professor Adams is responsible for the latter disadvantages. He has discussed the matter carefully, and has selected two of the most reliable and most easily applied rules for use by his readers. It is true that there are some newer formulas which permit computations to be made in more exact form, but they have not at present come into very general use, and for a work of the kind under review the author is perhaps wise in keeping to the beaten track. When speaking of "reliable strength," Professor Adams appropriately quotes the words of Professor Claxton Fidler that "the strength of columns cannot be defined by any hard-and-fast rule . . . ." and "must be represented by an area, within which the results of individual experiments may be expected to place themselves at haphazard." In such an area the results suggested by various formulas would be represented by different curves, and the most reliable formula must necessarily be that which passes near the greatest number of experimental results.

The remainder of the volume is devoted chiefly to a series of notes upon the safe dead load on foundations, the distribution of load on foundations, concrete filling, fire-resisting treatment, concrete in foundations, and American high buildings. We are pleased to observe, however, that reference is made to the effect produced by a non-axial load, by side thrust, and by foundations that are not central. These points are of much importance, but they too seldom receive attention from writers on the subject of column design. Part II. of the series is eminently practical, the whole of the information it contains being carefully chosen and clearly expressed.

The Cathedral Church of Ely. By REV. W. D. SWEETING, M.A. George Bell & Sons.

THE last issue of Messrs. Bell's small and useful series of cathedral churches is that of Ely, written by Rev. W. D. Sweeting, an ecclesiologist of some deserved repute. It is a good compilation, much use having been made of Dean Stubbs' "Historical Memorials of Ely" and the same writer's handbook. A full critical history of the fabric yet remains to be written, but such a work would require much original investigation, and we have no right to expect it in a book of some 130 pages, a large proportion of which is taken up by a series of upwards of forty good photographic reproductions. The cathedral church of Ely, the longest Gothic church in Christendom, contains fine examples of each successive style; as the exact date of nearly every portion of the fabric is known, this noble building is of the first importance to the student and lover of architecture. A handbook such as this, with its wealth of illustration, forms indeed a useful primer for the beginner. We could wish that Mr. Sweeting had been fuller in his descriptions in some parts, and spared us a rather tedious and commonplace calendar of the lives of all the Bishops of the See, which is too scrappy to be of any real value. For instance, the description of the large and unique fourteenth-century Lady Chapel is disappointingly meagre; an intelligent visitor with this book as his guide will be surprised to find that it gives no help with regard to the wonderful mutilated series of sculptures of the life of Our Lady all round the chapel. If Mr. Sweeting did not feel competent for the task, leave should have been sought to quote in abstract from Dr. Montagu James's work on the iconography of the chapel. Dr. James's admirable lecture on these sculptures was the great feature of the Cambridge meetings of the Royal Archæological Institute in 1892.

Mr. Sweeting deals tenderly with the prolonged and costly process of restoration that this fabric has sustained. Much of it was good and eminently necessary, but the original coloured decorative work of the vaulting of the octagon suffered much in 1879. There was one very queer incident of the restoration begun in 1862 which it would have been well to have named. The choir half of the effigies between the choir and the choir aisles were cleaned up, polished, and renovated, whilst the half on the aisle side were left untouched in their decayed condition. The old couplet, slightly altered, was then applied to this quaintly mean method of effigy restoration:—

"They brightened up the monuments within the ancient abbey,
But, thinking to deceive the Lord, they left the aisle side shabby!"

The Cathedral Church of Bristol: a Description of its Fabric and a Brief History of the Episcopal See. By H. J. L. J. MASSÉ, M.A. London: George Bell & Sons. 1901.

THIS is a further addition to Messrs. Bell's series, and, like the other volumes already noticed, is excellent in matter and illustrations. The majority of the latter are from photographs by Messrs. Bolas & Co. and the author. Particularly interesting are those of the curious tomb in the Berkeley Chapel on page 35, the skeleton vaulting in the vestibule to it, and the heraldic work now in the cloister, formerly on the destroyed choir screen. Two plans are given, one facing page 37 from "Britton's Cathedrals," showing the extent of the church in 1828, before the rebuilding of the nave; the other at the end of the book shows the building as completed. The deviation of the choir from the line of the nave, which is a marked feature of the interior, does not appear to have been noted, and the value of the plan would have been improved by the completion of the cloister, showing the position of the beautiful doorway excellently illustrated from a photograph by the author. The view on p. 46, taken from "Storer's Cathedrals," is not the north transept but the south. All the interesting architectural features are well and clearly described, and, like most others of the series, the work is a capital handbook to the cathedral.

The Abbey Churches of Bath and Malmesbury and the Church of St. Laurence, Bradford-on-Avon. By Rev. T. PERKINS, M.A. London: George Bell & Sons. 1901.

UNIFORM in size and style with the Cathedral Series, this volume illustrates three buildings, all of strongly marked character and difference in date, and lying in the same district not many miles apart. The smallest of the three and the earliest is the Saxon church at Bradford, capitally illustrated by a series of views from photographs by the author. The ground plan has no scale, however, neither have the larger plans at the end of the book of Bath and Malmesbury. Malmesbury, a picturesque mixture of Norman and Decorated, has recently undergone some repair, and some of the illustrations have been, apparently, taken during the progress of the works. Among many excellent photographs are two good views of the south side of the church (facing pages 65 and 75), a view of what remains of the "crossing" and two interior views of the north side of the nave.

Bath, though placed first in the book, is now a building of Late Perpendicular character. A good many fragments, however, remain of the Norman columns under the floor of the nave and choir; these, though noted in the letterpress, have been ignored in the plan. As in the other buildings, the illustrations are from photographs by the author. One of Prior Bird's Chantry in the choir and the Montague and Waller tombs shown on pp. 22-23 are, perhaps, the most striking of an interesting series.

The French Stonehenge; an Account of the Principal Megalithic Remains of the Morbihan Archipelago. By T. CATO WORSFOLD. London: Bemrose & Sons.

THIS is an interesting popular account of the stones at Carnac, with comparisons between them and the relics of the same class at Avebury and Stonehenge, and a brief summary as to the various popular and archæological beliefs in regard to these Breton monuments. It does not go further than this, and makes no attempt to throw new light on the subject of the origin and purpose of these collocations of stones; but it is an interesting illustrated account of them.

The author draws attention to two important distinctions between Carnac and Stonehenge; one is, the partial shaping of the blocks and the formation of the mortise and tenon joints between the uprights and the lintels at Stonehenge; the other, the fact that at Stonehenge; no human bones have been found at any time—so, at least, he states.

Early Defensive Earthworks. By J. CHALKLEY GOULD. Bedford Press.

THIS pamphlet of thirty pages gives the substance of two papers read before the British Archæological Association in 1899 and 1900, and is worth reproducing. Mr. Gould has no particular theory to advocate as to dates and origin of the early defensive earthworks of England; but in his desire to increase interest in them and to aid in their preservation, he writes pleasant and intelligent accounts of some of the more remarkable examples, such as the Carl's Wark and Main Tor, Derbyshire; Maiden Castle and Hod Hill, Dorset; and Ambresbury Banks, near Epping. Plans and illustrations add to the value of this reprint.

A Brief Sketch of the History of Ipswich School. By NINA F. LAYARD. Ipswich: W. E. Harrison. 1901. 1s.

THIS is mainly a history of the school foundadation, but it has a certain archæological interest in connexion with the ancient buildings in which the school was successfully housed. Down to 1763 the school was held in the chapel of the ancient Black Friars Monastery, the buildings of which were made over to the use of the school about 1565-66. From 1763 to 1842 the school was held in a fine room with a hammer beam roof over the Refectory. Part of the lower portion of the building is still standing, and forms the boundary wall of the girls' endowed school in Foundation-street. In 1842 the school was removed to a new building in Lower Brook-street, and in 1852 to the present building in Henley-road. Views of the various old buildings are given, as well as of the recent ones, as also a plan of the buildings on the site of Black Friars.

Weights and Measurements of Sheet Lead. By JAMES ALEXANDER. London: E. & F. N. SPON. 1901.

THESE are simply tables giving the area of lead for widths from 6 ft. to 7 ft. 10 in. and for many various lengths. They are compiled for the use of lead rollers, plumbers, builders, and architects, &c., to save time in arriving at the estimated weight of a given length and breadth of sheet lead, at so many pounds to the square foot. Thus, we can see at a glance that a piece of 6½ lbs. lead 20½ ft. long weighs 10 cwt. 3 qr. 2 lbs. It is a conveniently small book, and is calculated to save a good deal of trouble.

BOOKS RECEIVED.

THE WORKMEN'S COMPENSATION ACTS, 1897 AND 1900. By W. Addington Willis, Barrister-at-Law. (Butterworth & Co. and Shaw & Sons.)

A BRIEF SKETCH OF THE HISTORY OF IPSWICH SCHOOL. By Nina Frances Layard. (W. E. Harrison, Ipswich.)

THE FRENCH STONEHENGE. By T. Cato Worsfold, F.R.Hist.S., &c. (Bemrose & Sons).

A DICTIONARY OF ARCHITECTURE AND BUILDING: edited by Russell Sturgis. Vol. II.: F—N. (Macmillan & Co.).

WESLEYAN CHURCH, HELMSLEY, YORKSHIRE.—The Wesleyan Methodists of the Helmsley Circuit intend to rebuild their place of worship. Messrs. Hornsey & Monkman, York, are the architects.

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LONDON BUILDING ACT, 1894.

TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal under the London Building Act met at the Surveyors' Institution on Tuesday to hear an appeal by Mr. R. Langton Cole, on behalf of the Metropolitan Association for Improving the Dwellings of the Industrious Classes, against the disapproval of and the refusal of the London County Council to sanction the plans of a block of intended dwelling-houses to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of houses on the south side of an unauthorised street, known as Gibson Buildings, Northwold-road, Stoke Newington. The members of the Tribunal sitting were Messrs. J. W. Penfold (Chairman), A. H. Hudson, and E. A. Grüning.

Mr. Cole conducted the appellants' case in person, and Mr. Andrews and Mr. Godfrey, of the London County Council solicitors' department, were for the Council.

Before Mr. Cole opened the case for the appellants Mr. Andrews remarked that they were so very near each other in agreeing that it did not seem desirable to prolong the proceedings by producing unnecessary evidence. The Association sent plans to the Council showing their proposals, and the Council were bound, under Section 42 of the Act, to refuse or approve them within a certain time. They refused to sanction the plans because they wanted certain conditions, and at his (Mr. Andrews') suggestion they wrote to Mr. Cole proposing that he should see them and discuss the points with the Council. He could assure the Tribunal that the Council was very anxious not to retard or stand in the way of the erection of working class dwellings by a responsible Association such as the appellants on well-conceived lines, and it seemed probable that the Council would be able to meet Mr. Cole and to come to some arrangement which would obviate the difficulty which the Council felt would ensue by their not passing the plans. Practically, it had come to this: Mr. Cole was prepared to give the amended plans as suggested to him, and in view of that fact it would be for the Tribunal to make an order registering them. But even if the scheme, if it remained as it now stood, could not be considered in any way undesirable by the Council, it was more on the *qui timet* principle—looking forward to what might happen in regard to the adjoining ground—that they acted.

Mr. Cole: I take it that the County Council would agree to the plans as they now stand were it not for the possible alteration in the adjoining buildings? The plans of the building as at present produced are in accordance with the section.

Mr. Andrew: I do not say that we are not entitled to refuse even on the plans.

Mr. Cole replied that if, without going so far as that, the Council would consent to the plans, they might subsequently get over the difficulty with the adjoining owners. He contended that on the plans he was entitled to a decision in his favour.

Mr. Andrews said that clearly the County Council were entitled to act on their discretion; on the other hand, they were prepared practically to concede, so far as they were able, their objections in regard to the plans.

The Chairman said that as he understood it, the Council would not object to the plans if some arrangements were come to with the adjoining owner.

Mr. Andrews assented.

Mr. Cole pointed out that he had an interview with Mr. Andrews as was suggested, and the net result was that the Council would not object to the plans, provided that the District Surveyor passed them. He applied to the District Surveyor on May 6, and he at once said that he would not pass them, and must throw the responsibility upon the Council. On May 22 he forwarded the plans to the Council under Sections 41 and 42, and the result was the refusal to approve unless arrangements were made with the owner of the adjoining land, by which he would agree not to raise the height of his buildings inside his line. It was obviously impossible for them to comply with that. The owner, unfortunately, was only the leaseholder, and any arrangement as to the future height would necessarily take considerable time, and involve more expense to the Association than they could afford to spare. Under the circumstances the Association decided that their proper course was to appeal. If the Council required as a *sine qua non* that this condition should be exacted from the adjoining owner, it was apparent that the appellants could not insist on the terms suggested. They would rather suggest some modifications of the plans by which possible difficulties might be surmounted. He ventured to suggest that it was unreasonable for the Council to refuse the plans of buildings which entirely complied with the Act on the ground that in future something might happen which was beyond the Association's control.

Mr. Andrews said there were many points in the plans which would entitle them to refuse sanction. For instance, there was the question of access. If they fought the appeal out there were other points, but they were small. If the adjoining owner would say that he was not going to raise his buildings at present on what they called the dairy premises, the Council would be satisfied. It was possible if the adjoining building was heightened, the living rooms, particularly the kitchens, of the proposed dwellings would become, so far as they abutted on each floor, unhealthy. If the suggested terms could not be come to, then possibly some modifications could be made in the plans.

The Chairman said the Tribunal had no power to make such conditions.

Mr. Cole said he did not wish to fight the case out in a spirit of hostility, but his clients felt that the Tribunal should decide, as they believed they would, that the plans complied with the Act.

After further discussion the Tribunal allowed the appeal and approved the plans on certain conditions—namely: (1) That the cottages on the north-west side of the proposed new buildings shall not be added to or raised; (2) that no building be erected on the area between the adjoining dairy buildings and the proposed building; (3) that a sufficient access of not less than 3 ft. in width be provided between certain points, and that the access at the eastern end of the site be by a slope and not by steps.

Illustrations.

ST. MARY WOOLNOTH.

THE plan and the two sections of Hawksmoor's remarkable church, which has with difficulty been saved from destruction at the hands of a railway company, are reproduced from measured drawings made by Mr. Alfred C. Bossom. The perspective view of the west front was specially drawn for the *Builder* by Mr. W. Curtis Green.

A church of St. Mary Woolnoth is cited as early as the year 1274 (*see* Dr. Sharpe's Calendar of Wills, proved and enrolled in the Court of Husting, Part I., 1889) under an entry whereby Geoffrey Godard devises to the church half a mark annual rent for arrears, and to his eldest daughter, Johanna, his capital house in the parish. Some maintain that Woolnoth is a corruption of "Wulfnoth"; others that it is a corruption of "woollen hithe"; though the wool hithe, or wharf, we may observe, was situated in Lower Thames-street, near the Tower. It is also asserted that the name of the former neighbouring and daughter church of St. Mary Woolchurch Haw (or Ulnorum) was derived from the haw, or garden, appertaining to "Wlnotmaricherche" cited in a deed of 1191—*teste* Mr. J. H. Round in the *Athenæum* of March 31, 1888. *Note*, or *neath* signified "business" or "traffic"; the connexion of St. Mary Woolchurch Haw (which stood where are now the Saloon and the Venetian and Long Parlours of the Mansion House) and of St. Mary Woolnoth with the wool trade obtains general acceptance. Stow says that the former was "so called of a beam placed in the churchyard which was thereof called Woolchurch Haw of the tonnage or weighing of wool there used."

However that may be, a church was standing on the present site (supposed, though erroneously, to have been that of a Christian church, previously dedicated as a temple of Concord), in the earlier years of the thirteenth century for a parish taken, with others, out of that of St. Mary Aldermary. That church was rebuilt about two hundred years afterwards, a chapel and a steeple being added by Hugh Brice, or Bruce, who was elected Lord Mayor in 1485, and died in 1496. The church was again rebuilt in 1620.

After the great fire Wren repaired the north side of the church in 1677, but a "case" presented to Parliament in the reign of Queen Anne sets forth that "the east end, adjoining her Majesty's post-office, with the south side, west end, and tower thereof, were not rebuilt," and that the north side had become ruinous and dangerous, insomuch so that the parishioners feared to attend Divine service. An Act of Queen Anne appropriated a certain sum to be raised by a tax upon coal for the new church, which, according to an inscription upon the front of the former organ-gallery was completed in 1727, from the design of Hawksmoor. Twenty of Hawksmoor's working drawings are preserved in the British Museum. The rectory house was built after Sir Robert Smirke's designs. On May 28, 1892, we published a lithograph from a monochrome water-colour drawing by Miss A. Fooks, showing (in part) the interior as it was remodelled in 1875-6, by Mr. Butterfield, who removed the galleries but happily retained their fine carved fronts by fixing them as an architectural feature around the walls, where they plainly tell the history of the change. In 1868 the organ, against the north wall (by Smith, 1681), was rebuilt by Messrs. Gray and Davison; in 1875 it was moved to the east end.

During some months in 1886 the church remained closed by reason of the insanitary condition of the vaults underneath the floor. Under Mr. F. C. Penrose's directions the under surface of the vault arching was covered with iron joists, and concrete was overlaid with two ½-in. thicknesses of asphalte. In November, 1892, a faculty was granted by the Consistory Court for the removal, at a cost of 2,000*l.*, of all the human remains from beneath the church, the untoward condition of which, in that respect, it had been foolishly contemplated to remedy by pulling the entire building down.

The church was again threatened with demolition by the promoters of the extension line to Islington of the City and South London Railway Company. In the result the church was closed during a period of three years, 1897-1900, whilst it was in temporary possession of the railway company for the construction of a station in the place of the crypt, of which the walls were found to be built, for the most part, of chalk. In that interval the interior of the church was renovated and redecorated under the superintendence of Mr. A. R. Stenning, the decorations being carried out by Messrs. Heaton, Butler, & Bayne, with an electric light installation by Mr. Sclater. The church was re-opened in May, 1900. The four Corinthian columns and the north, south, and west walls now rest entirely upon steel girders six or more feet deep which extend from end to end of the structure; the whole floor was relaid with wooden blocks; the vestry was rebuilt and remodelled, and its floor raised to the level of that of the church, by the railway company, and so far, as we gather, no trace of settlement has been discovered. We may add that this is the first City church that was opened for daily prayer; that the chancel chairs are made from a pile of old London Bridge; and that the remains of John Newton, the rector and Cowper's friend, were removed from the crypt to Olney in January, 1893.

On the north wall is a mural monument to the memory of Henry Fourdrinier (1730-1799), stating that "in his character were combined the kind husband, good father, and sincere friend." This Fourdrinier was the son of Paul Fourdrinier, the well-known engraver of architectural subjects, whose name is found in the corner of a good many of the plates in Kent's book of Inigo Jones's designs, and in other publications of the period; and he was the father of that Henry Fourdrinier who expended his large fortune in perfecting the paper-making machine, and the great-grandfather of the present publisher of the *Builder*.

The following are some notes on the construction, made by Mr. Bossom while measuring the work:—

"The accompanying drawings show a few peculiarities in the construction of the church; there are also a few noteworthy points that the drawings do not show—for instance, the main entablature is partly composed of a wood bressumer, which sags slightly in the middle. The cornice of this entablature is a casing supported partly by a 9-in. by 3½-in. iron joist, to which it is connected with iron straps, and partly by the bressumer. The upper entablature is composed of plaster, and the walls also have had a thin coat of it on them, but this is not thick enough to obliterate the stone joints. The walls of the clearstory do not follow centrally over the capitals of the columns below, but are slightly on the inner side.

The small turrets on the tower are partly carried on the external walls and partly on a stone lintel (halved as though it were of wood) which extends across the inside of the tower at the level of the capitals outside.

The roof is constructed of wood as shown on the sections. The horizontal portion of the construction is a very complicated arrangement, the members varying between 10 in. by 11 in. to 3½ in. by 2 in. Lead forms the outer covering.

All the lower windows facing King William-street are double and have a space of 11½ in. between the two leaves.

The wood panels and door that are shown in the north section on the wall, form the remains of a gallery that once extended along each side of the church.

The work generally seems to be in a very good state of preservation, the interior especially, as it has only recently been thoroughly

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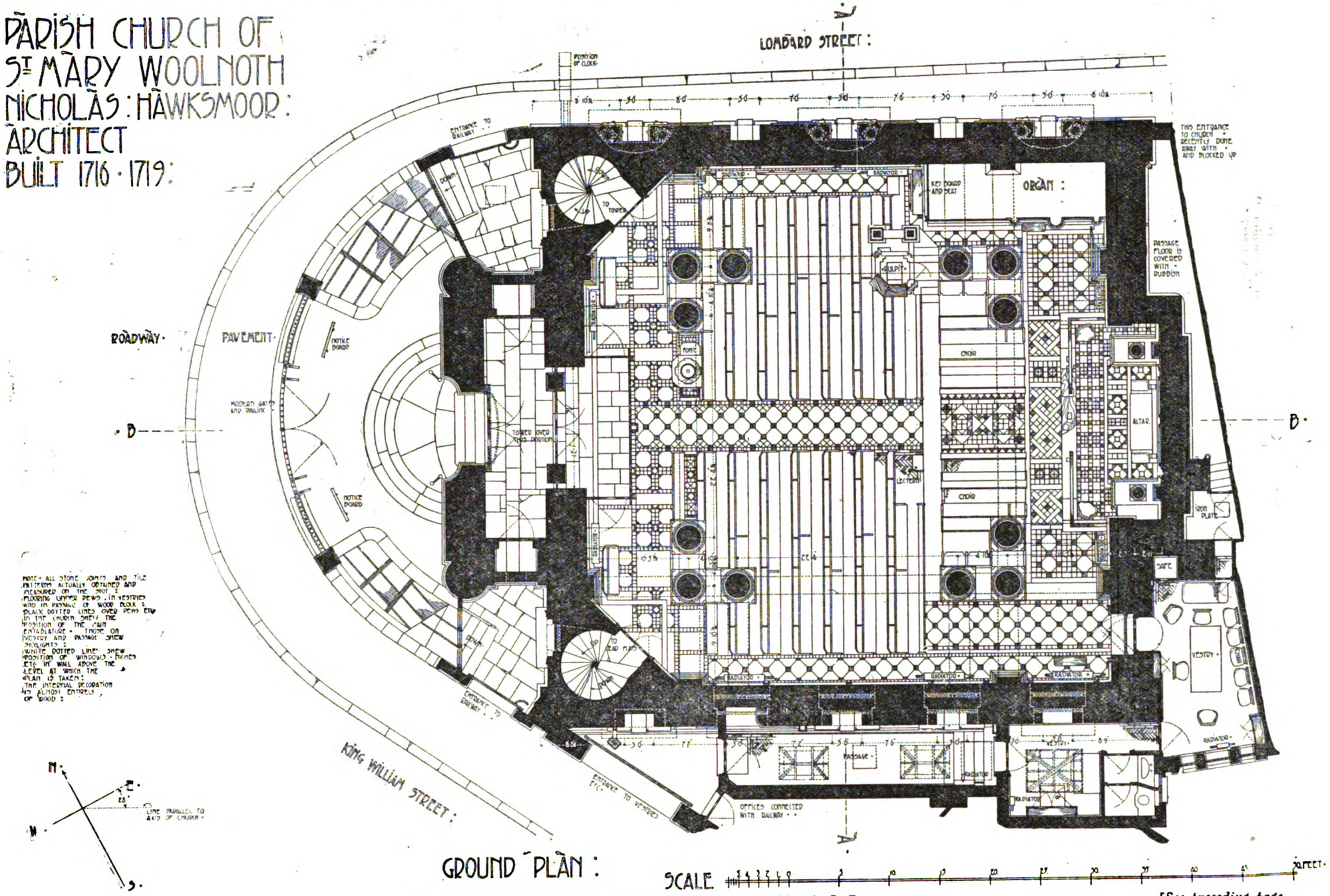
PARISH CHURCH OF ST MARY WOOLNOTH NICHOLAS: HAWKSMOOR: ARCHITECT BUILT 1716-1719:



NOTE:- ALL STONE JOINTS AND TILE PAVEMENT ACTUALLY OBTAINED AND MEASURED ON THE SPOT: FLOORING UNDER PEWS &c IN VESTRY AND IN PASSAGE OF WOOD BLOCK: BLACK DOTTED LINES OVER PEWS ETC IN THE CHURCH SHEW THE POSITION OF THE MAIN ENTABLATURE - TIGHT OR VESTRY AND PASSAGE SHEW SKYLIGHTS: WHITE DOTTED LINES SHEW POSITION OF WINDOWS - TAKEN ETC IN WALL ABOVE THE LEVEL AT WHICH THE PLAN IS TAKEN: THE INTERNAL DECORATION IS ALMOST ENTIRELY OF WOOD:

GROUND PLAN:

Plan of St. Mary Woolnoth. Measured and Drawn by Mr. A. C. Bossom.

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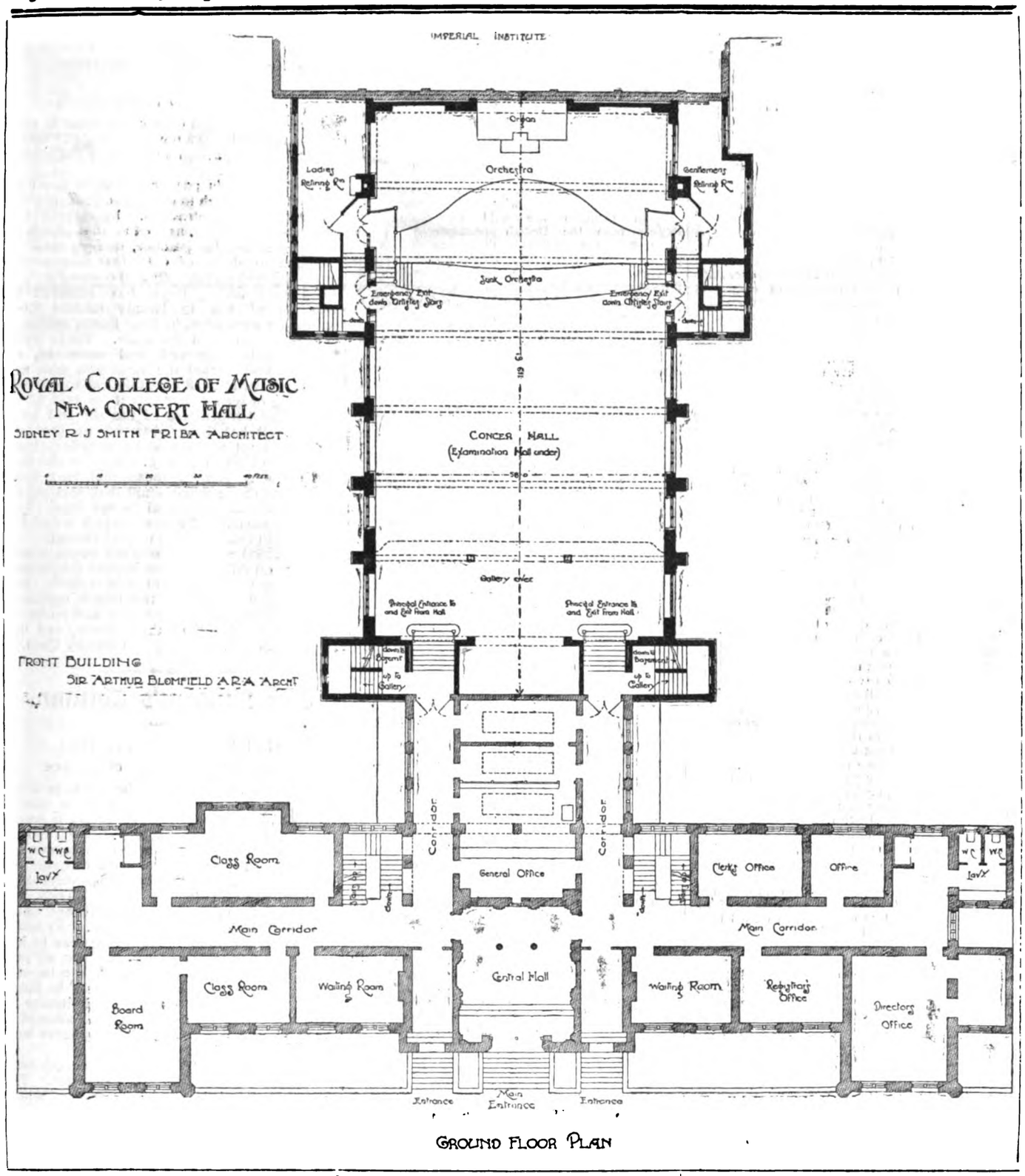

GROUND FLOOR PLAN

renovated, at which time the colour decoration on the walls was done away with."

The west front of the church is a notable example of Hawksmoor's originality of style, and, for its scale, is one of the most remarkable and powerful bits of architecture in London. It is instructive as showing how it is possible to be original without the invention of new architectural details. The forms of columns, pilasters, cornices, &c., are such as are familiar to us and are all to be found in books; yet the whole thing is a distinctly new conception, resembling no other classic building.

NEW CONCERT HALL, EXAMINATION HALL, &c., ROYAL COLLEGE OF MUSIC.

THE design for this building was selected in competition, Mr. Belcher, A.R.A., being the assessor, and Mr. Sidney R. J. Smith's design was placed first and he was instructed to carry it out.

The new buildings are at the rear of the college, and comprise the large concert-room, 119 ft. long by 58 ft. wide and 43 ft. high, with a gallery at one end, the seating capacity of the whole being 900, while the orchestra will accommodate a band and chorus of at least 230 performers. On the east side of the hall at the orchestra end are artists' rooms on three floors, and beneath the hall is a spacious examination-room, 78 ft. long, 58 ft. wide, and 16 ft. in height; there are also large storerooms, heating-chamber, and hydraulic engine and bellows room for blowing the large organ.

The roof is constructed of iron with fibrous plaster soffit, elliptical in shape, and heavily moulded in panels, there being a passage-way through roof for ventilation, electric wires, &c. The room is faced internally with Parian cement and a wooden dado all enamelled white. Externally the building is of red brick and green slates to roof. There are spandril figures (different subjects) internally over each window emblematic of "Music," modelled by Mr. Wheatley. The lighting is by electricity, concealed lights being placed all along main cornice, while a few brackets below give light at other places necessary.

The orchestra, under the direction of the director, Sir Hubert Parry (who presented the organ to the college), has been very carefully considered, and is said to have worked extremely well at the opening concert. Part of it can be extended by means of rollers, or if a smaller orchestra is required it can be reduced by running it under the fixed parts.

The building was erected by Messrs. G. H & A. Bywaters; Messrs. L. D. Berry & Sons did the warming; Messrs. Spagnoletti & Co. the electric lighting; Messrs. Dennett & Ingle the ironwork; Mr. J. Stone the iron casements and doors; and Messrs. Shuffrey & Co. the stoves.

We give a plan of the additions, with a section and part elevation of the interior of the hall, from drawings kindly prepared for us by the architect.

CHURCH, SMETHWICK.—The new Church of St. Chad's at Cape Hill, Smethwick, was consecrated on the 1st inst. The building provides accommodation for 600 worshippers. The interior is faced with red brick dados and quoins to all windows, the remaining portions of the walls being plastered. The open-timbered roof is of pitch-pine and red deal. The building, which cost 5,250*l*, was erected by Messrs. J. Harley & Son from the designs of Mr. F. J. Gill.

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AMERICA AND THE CEMENT INDUSTRY.

IN view of the extraordinary development of the cement industry in the United States, which does not appear to have been receiving from British manufacturers the amount of attention it deserves, Mr. Bell, the British Commercial Agent in the States, has been at some pains to collect and summarise the available information on the subject. From his exhaustive Report we gather that during the nine months ended March last, out of 541,701,557 lbs. of cement imported, the United Kingdom only supplied about 11 per cent. The previous year the British cement imported amounted to 9·5 per cent. of the total, whilst in 1899 it was more than 15 per cent. In 1891 only 13·2 per cent. of the cement used in the United States was of American manufacture, while in 1899 this percentage had risen to 73·9. This increase of output of American-made cement is, however, barely doing more than keeping pace with the increase in demand; consequently the imports do not show the decrease that might be expected. So many new factories are being built that in time the increase in supply will exceed the yearly increase in demand, and the amount imported will decrease in proportion. It will nevertheless be many years before the importation of cement will cease entirely. There has been for long a great prejudice among contractors and engineers against the home product, but this is fast disappearing. Mr. Bell thinks that in time it will disappear entirely, and that the United States will be able to produce sufficient to supply all its home markets, together with a surplus for export. It is a very sore point with the American cement manufacturers that there are still engineers who specify for imported Portland exclusively, notwithstanding the fact that many of the best brands of the home product are establishing a reputation for high quality, and the manufacturers are willing to offer substantial guarantees. The manufacturers maintain that the domestic product is at least equal in quality to the German, and is from 50 c. to 1 dol. cheaper. Of foreign cements, the German has the largest sale in the United States. During the nine months ended March last, Germany supplied 46 per cent. of the total amount imported; in 1900, for the corresponding period, 54 per cent.; and in 1899, 49 per cent. Belgian cements come next with 34 per cent. in 1901, 30 per cent. in 1900, and 32 per cent. in 1899. The price of German cement imported during the nine months ending March averaged a little over 40 c. per cwt. The Belgian averaged nearly 35 c., and that from the United Kingdom about 43½ c. per cwt. The previous year the German cement averaged 40 c., the Belgian about 33½ c., and the British over 44 c. per cwt These figures would indicate that the Belgians are able to do their business on account of the low price of their product, notwithstanding its acknowledged inferiority, while the Germans are practically underselling the British, it being conceded that there is not much difference in the quality of the best brands of the two countries. In 1898 there were thirty-one works in the United States, producing 3,602,284 barrels of Portland cement, valued at 5,070,773 dols, and in 1899 there were thirty-six works, producing 5,052,266 barrels, valued at 8,074,371 dols. That is to say, there was an increase of 53 per cent. in quantity, but only 35 per cent. in value. The Lehigh Valley region in Eastern Pennsylvania and Western New Jersey is the seat of the first successful establishment for the manufacture of Portland cement, and has from the first produced more than the rest of the States combined. This is due to the occurrence in that district of an immense deposit of clay limestone, belonging to the calciferous formation which has nearly the composition of a Portland cement mixture. There are two works in the district said to be larger than any other works in the world. One is producing 8,000 barrels per day and is increasing its capacity still further. Owing to the keen competition in the States, a sharp fall of prices may be anticipated as far as the domestic product is concerned, and there may also be a decrease in the demand in the course of the next few months; the result will be the shutting-down of many of the smaller and less favourably situated works, owing to over-production. In modern American cement plants, as in nearly ever other works in the United States, the notable feature is the substitution of fuel and power for labour. Manufacturers understand the necessity of reducing the cost to a minimum. Machinery is substituted wherever possible to eliminate labour. Crude petroleum and natural gas are used when possible for fuel, and the latter is sometimes used to drive the engines. In some of the modern works electric power is used for driving the machinery as well as for lighting purposes. In the best arranged works the rock, from the time it is loaded into trucks in the quarry to the time it is packed as finished cement ready for shipment, is not once moved by hand. The only manual labour employed in the mill proper is that necessary for operating the machinery. The main idea is to make the plant as nearly approaching automatic as possible. Every known mechanical device for rapidly and efficiently handling the materials is introduced wherever possible. This is often done at considerable cost, and the apparatus is duplicated as far as possible in order to avoid delays should any part become broken. This is considered as of considerable importance in the manufacture of cement, where the wear and tear is so great. In addition to Portland cement, large quantities of natural rock cement are manufactured. This is chiefly made in the States of Indiana and New York. In the year 1899 there were seventy-six works, producing 9,868,179 barrels, valued at 4,814,771 dols. The total consumption of imported Portland cement during the same year was 2,108,388 barrels, and of the domestic Portland 5,052,266 barrels, bringing the total consumption of all kinds of cement up to 17,028,833 barrels. In endeavouring to ascertain the reason why the German and Belgian cements are sold so much more largely than the British product, Mr. Bell found that a considerable difference of opinion prevailed, but he considers that the various points of view are comprehended and explained in the following three opinions which he quotes textually, and neither of which, he points out, is favourable to the British manufacturer:—1. The representative of an important importing house, handling three German brands, two British, and one Belgian, says: "The falling-off in the sale of British Portland cement in this country which took place some five or six years ago was partly due to the fact that the German cements proved so much more satisfactory as to quality, and Belgian cements of fair quality selling so much cheaper, while British makers were unwilling to make any improvement in the quality of their product. Notwithstanding, there continued to be a limited sale for the British brands, but during the last few years British makers had such a demand for their cement at home and from other foreign parts that it enabled them to obtain a higher price for their cement elsewhere than in the United States, so that they did not care to make any concession to the American trade, and this has led to a further decline in the sale of British cement in this country, which in the Eastern and the Western States is at present very unimportant. On the Pacific Coast, where the British makers have the advantage of very low freight rates, their cement is still sold in considerable quantities." 2. An American cement expert expressed the following view: "British cement was at one time almost the only Portland cement in our market. German cement rapidly replaced it, however, owing to the superior quality of the German product. No doubt some brands of British cement are now much better than formerly, and probably equal to the best German. However, there is an immense number of German masons in this country who prefer the German product and will use no other. The Belgian cement gained a foothold in consequence of its low price, and has been preferred to the American Portland on account of being an imported article. It is certainly generally inferior in quality. The low price of American cements has nothing to do with quality, but is due to senseless competition among American manufacturers. Tests made by a multitude of competent engineers show that the best American cements are superior to all other brands. In my judgment, the only reason why any cement is imported is that the American product has until lately been insufficient in quantity, and also that there are many consumers who are willing to pay a higher price for an imported article, regardless of tests." 3. The editor of the leading cement trade journal writes: "Our own idea of the subject is that the German cement manufacturers are more thoroughly represented in the United States and make a greater effort to obtain orders in the interior than do the British manufacturers. German cements are more thoroughly advertised, and when making contracts with cement brokers they have the contract read that said brokers shall employ travelling salesmen to secure orders. In our opinion, the British cements imported into the United States are fully equal to the German product, as the makers of the poor British grades find no market here. The German manufacturers obtained a strong foothold in the United States owing to their first introducing cements adulterated with 2 per cent. or less of gypsum, which controls the setting of the cement, and for this reason they have maintained their prestige among certain consumers."

ST. CUTHBERT'S CHURCH, SHEFFIELD. — The foundation-stone of St. Cuthbert's Church, Firth Park-road, Sheffield, has just been laid. The building forms part of a church extension scheme, which was inaugurated about two years ago, and it will be the centre of a new parish formed of parts of Ecclesfield, Grimesthorpe, and Pitsmoor. The contract has been signed for 5,300*l.*, but the church will cost about 3,000*l.* more to complete. The building will be erected on a site between Barnsley-road and Firth Park-road. It will be in the Early English style, and will be built of stone. The present contract is for the chancel, organ chamber, and vestries, a part of the nave, and the corresponding portions of the transepts. The church has been designed to accommodate a congregation of about 700; but the portion of the edifice which will be completed under the present contract will only afford accommodation for half that number. Mr. J. D. Webster is the architect for the church, and Messrs. George Longdon & Son are the contractors.

Correspondence.

To the Editor of THE BUILDER.

PORTLAND CEMENT.

SIR,—The article in your last issue is very interesting, and so is a recent illustrated "Note" on the chemical action involved in the setting of the cement.

What architects particularly want is not so much great strength in cement as freedom from expansion and contraction. Recently it has been my experience, as well as that of others engaged in similar practice, that in the construction of floors of coke breeze concrete, freely exposed underneath and covered with a wood floor above, there has occurred at intervals of ten to twenty months after setting an expansion, in long floors, sufficient to cause fractures in the walls. These walls are internally plastered and examined, so that it is known that the expansion does not take place earlier. It is not the expansion due to slaking or setting, nor can it be said to be due to the temperature of the set and solid mass, as it has been observed in concrete which was set at the initial atmospheric temperatures of 40 to 75 deg. Fahr. Some that was set at 40 deg. expanded that long time after at 75 deg.; while some that was set in the hot weather expanded in the cold. The cement was cooled by aëration and tested for soundness before use, but not for strength.

If your scientific contributors could throw any light on this mysterious subject they would do great service to many of your readers. My own impression is that the future tendency will be towards the separation and exclusive use of the "*flour*" of the cement, and the rejection of *all residue*. CEMENT USER.

The Student's Column.

GAS AND GAS FITTINGS:

3.—PURIFICATION OF COAL GAS.

CONDENSERS.—The temperature of the gas as it leaves the main is usually about 130 deg. Fahr., or as it leaves the foul main about 125 deg. Fahr., and in order to cool it to atmospheric temperature the gas is led from the foul main through the condensers. These may be either vertical or nearly horizontal (fig. 4) pipes. They are exposed to the open air, and if of the horizontal form, may be cooled in hot weather by being sprinkled with water. The condensers in use vary greatly in size and form, but are all provided with means for drawing off the tar and ammoniacal liquor which condenses in them. Very rapid cooling is found prejudicially to affect the quality of the gas, and no attempt is made to cool it below the atmospheric temperature.

Exhausters.—The gas leaving the condensers usually passes next to an exhauster. The exhauster is a description of pump which draws the gas (through the hydraulic main and condensers) from the retorts, and prevents the gas from accumulating under pressure in them; while the gas as it passes through the exhauster is so compressed that it issues from the outlet at a pressure sufficient to enable it to force its way through the washing and purifying apparatus and station meter, and to lift the bell of the gasholder.

Washers and Scrubbers.—After removing the condensable matter from the gas by passing it through the condensers, the gas as it leaves the exhauster is led to the washers and scrubbers where it is washed and scrubbed in order to remove as far as practicable all the soluble impurities.

The term "washer" is usually applied to a rectangular tank in which the gas bubbles through the liquid washing agent, while the term "scrubber" is applied to the vertical tower in which the gas filters through a bed of material having its surfaces maintained in a moist condition. The term "washer-scrubber" is applied to an apparatus in which both washing and scrubbing are effected. The three terms are, however, sometimes used indiscriminately.

In the washers the gas is washed in the ammoniacal liquor obtained from the hydraulic main and condensers, as this liquor may be made to retain a further quantity of the impurities remaining in the gas. To this liquor

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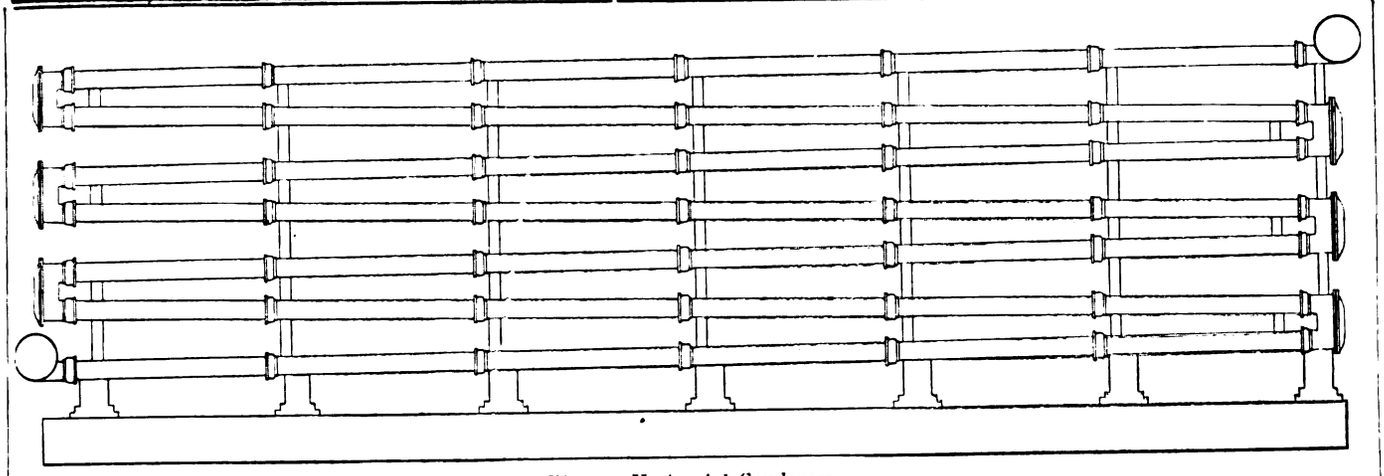

Fig. 4.—Horizontal Condenser.

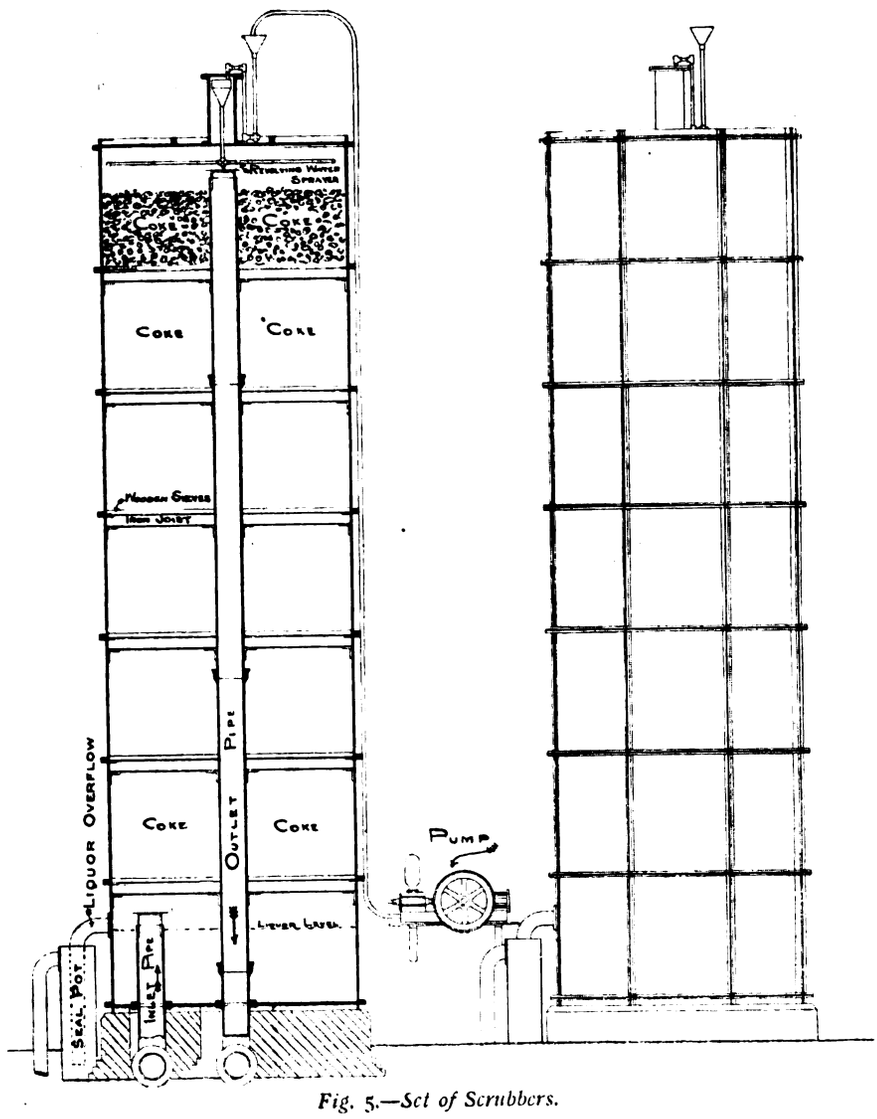

Fig. 5.—Set of Scrubbers.

may be added the weakest liquor from the scrubbers. The washers used in many works are rectangular tanks fitted with a number of perforated trays immersed in the ammoniacal liquid. The volume of gas is broken by being admitted through perforated tubes and by contact with the trays, and rises in small bubbles through the liquor. In the washers the remaining portion of tar is extracted from the gas, hence the washers are sometimes termed "tar extractors." In other cases a specially constructed "tar extractor" is put in action before the washers. From the washers the gas passes to the scrubbers, where with the aid of weak ammoniacal liquor and finally of clean water the ammonia still remaining in the gas together with a quantity of other soluble impurities is removed.

The scrubber towers (fig. 5) are usually filled with coke down which water is allowed to trickle. The gas flowing upwards meets the descending water and parts with its ammonia. In more modern scrubbing appliances washer-scrubbers having circular brushes or a series of perforated discs attached to a central shaft are made to revolve at a slow speed and cause the water to come into intimate contact with the gas. The object of all washing and scrubbing devices is to remove the ammonia from the gas with the use of as little water as possible, for the greater the quantity of ammonia in the "gas liquor" obtained, the greater is its value for the purpose of manufacturing sulphate of ammonia.

Purifiers.—After leaving the scrubbers the gas still contains a certain quantity of sulphuretted hydrogen, carbon dioxide, and carbon bisulphide, which should be removed.

The carbon dioxide (commonly called carbonic acid) is abstracted by passing the gas through slaked lime, carbonate of lime being formed (fig. 6). The sulphuretted hydrogen may also be removed by slaked lime, but the sulphur in the lime compound produced cannot readily be recovered, and the compound itself possesses such an obnoxious odour that its production in large quantity in any residential neighbourhood is liable to be resented. The sulphuretted hydrogen is therefore now usually removed by passing it through hydrated oxide of iron to which sawdust has been added to render the oxide more porous. The sulphide of iron produced is decomposed when allowed contact with air into oxide of iron and free sulphur, and before being permanently put out of action the oxide is several times turned out of the purifiers and exposed to the atmosphere for revivification. The free sulphur can be employed without difficulty for the manufacture of sulphuric acid, and is therefore a residual of considerable value. The "spent oxide," as it is called, has also the advantage of emitting a less objectionable odour than lime which has been saturated with sulphuretted hydrogen.

The carbon bisulphide has no affinity for slaked lime, but slaked lime which has been saturated with sulphuretted hydrogen readily abstracts it from the gas. The carbon bisulphide is therefore removed by passing it through lime which has been "sulphided" on the works.

The scheme usually adopted for the dry purification is the following:—The gas from the scrubbers enters a set of purifiers containing slaked lime spread in layers upon wooden grids. The carbon dioxide and the sulphuretted hydrogen are at first both abstracted by the lime, a mixture of carbonate of lime and hydroxyhydrosulphide of lime being formed. But carbon dioxide is able to decompose hydroxyhydrosulphide of lime [CaOHSH], driving out the sulphuretted hydrogen and itself combining with the lime to form carbonate of lime. When, therefore, the gas containing both carbon dioxide and sulphuretted hydrogen does not meet with sufficient free slaked lime to readily satisfy all the carbon dioxide, the carbon dioxide begins to attack that portion of the lime which has been combining with the sulphuretted hydrogen, and turning out the sulphuretted hydrogen, sends that impurity forward again with the gas, and itself combines with the lime. The carbon dioxide is therefore retained in the first set of lime purifiers, while the gas still containing sulphuretted hydrogen, but not carbon dioxide, passes forward to a second set of lime purifiers. Here the sulphuretted hydrogen is able to combine with the lime undisturbed by the presence of carbon dioxide. When the second set of purifiers is sufficiently charged with sulphuretted hydrogen these purifiers are employed to purify the gas from carbon bisulphide, while the sulphuretted hydrogen which still continues to come forward is removed by passing the gas through a third set of purifiers containing hydrated oxide of iron. In some cases, after the sulphide purifiers have been prepared, the purifiers containing oxide of iron are brought into action between the carbonic acid purifiers and the "sulphide" vessels, so that the gas passes first through the lime purifiers, which remove the carbon dioxide, then through the oxide of iron purifiers, which remove the sulphuretted hydrogen, next through the sulphide purifiers, which remove the bisulphide of carbon, and, finally, through another oxide of iron purifier, termed "the check box," which removes the small quantity of sulphuretted

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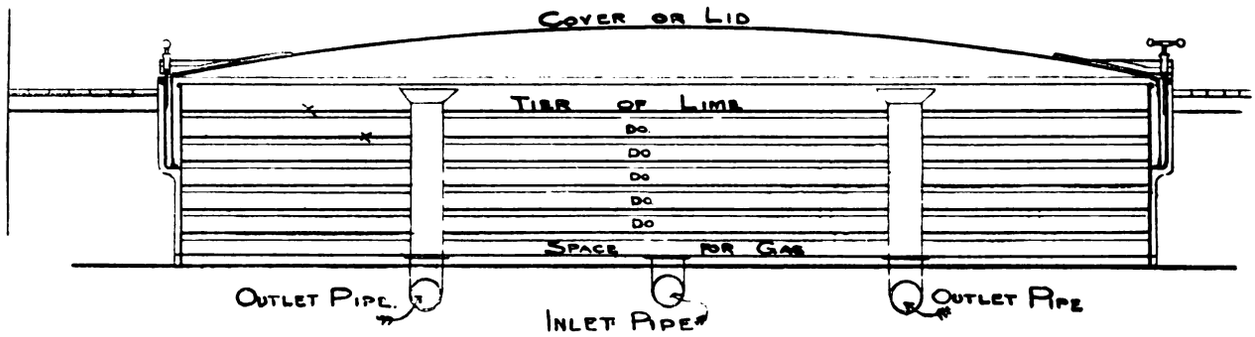

Fig. 6.—Section through Purifier.

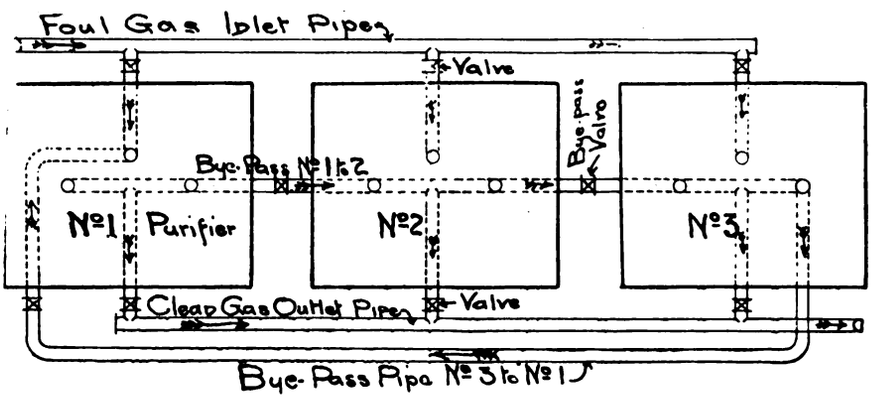

Fig. 6a.—System of Connecting Pipes for a Set of Purifiers.

hydrogen which is evolved from the sulphide purifiers.

Many years ago "milk of lime" was used for gas purification, and the waste product acquired great notoriety under the name of "Blue Billy" on account of its horrible odour. Owing partly to the difficulty of disposing of the waste material, the liquid paste has long been superseded by the comparatively dry hydrate of lime, which when "spent" has a somewhat less foul odour, and can be reburnt on the works and used again for purification, or, after long exposure to the air, can be carted away for agricultural purposes without attracting undue attention by its perfume.

Many gas manufacturers do not purify the gas so thoroughly as it has to be purified in London. In many cases no attempt is made to remove the carbon bisulphide, but by Act of Parliament all gas supplied to consumers must be free from sulphuretted hydrogen, and consequently this impurity is, as a rule, removed as completely as possible. The carbon dioxide is also usually more or less completely removed, because it prejudicially affects the illuminating power of the gas. One per cent. of carbon dioxide in the gas reduces its illuminating power about 4 per cent.

Mixing Air with the Gas.—When consumers of gas make the discovery that air is being deliberately added to the gas passing into the purifiers, they in many cases imagine that the air is being added to serve as an adulterant. Now the presence of 1 per cent. of air in the purified gas diminishes its illuminating power by about 6 per cent., 4 per cent. of air reduces the illuminating power 25 per cent., and 45 per cent. of air causes the gas to burn with a non-luminous flame. It is evident, therefore, that air cannot in practice be used as an adulterant, for its presence in any appreciable quantity would be at once apparent even to the untrained eye when the gas was used as an illuminant.

The fact is that a quantity of air not exceeding 3 per cent. of the gas purified is in some works let into the purifiers to oxidise the sulphur compounds of lime or iron which are formed there, but the atmospheric oxygen is all abstracted by the material in the purifiers before the gas passes from them. The atmospheric nitrogen passes forward with the gas, but is too small in quantity to exert much influence. Usually the proportion of air admitted is limited to a maximum of 1½ per cent.

In oxide of iron purifiers the oxygen of the air attacks the sulphide of iron formed by the action of the sulphuretted hydrogen on the iron oxide, and re-converts it into oxide of iron, while the sulphur displaced by the oxygen is found in a free state mixed with the oxide. The admission of air makes it possible to use the oxide for a longer period before it is necessary to turn it out and expose it to the atmosphere for more complete revivification. In fact the oxide need not be revivified in the open air until some 25 per cent. of its weight consists of free sulphur. The use of air in the purifiers also diminishes the odour emitted by the spent material when first exposed to the open air.

In lime purifiers air is often admitted when the scheme adopted for purification from sulphur compounds is different from that previously described. About 1½ per cent. of air is admitted to partially sulphided lime purifiers, the oxygen oxidises the sulphur compounds of lime, and free sulphur often amounting to 10 per cent. is found in the spent lime. Spent lime from purifiers to which air has been admitted creates less nuisance than spent lime from sulphide purifiers from which air has been excluded.

Other schemes and other substances have been adopted for gas purification, but lime and hydrated oxide of iron used in a manner more or less approximating to the system here delineated are employed more extensively than any other materials.

GENERAL BUILDING NEWS.

CHANCEL RESTORATION, HALES CHURCH, NORFOLK.—The ancient Church of St. Margaret, Hales, has recently undergone further restoration, the chancel having just been restored. The old box pews have been removed, and oak benches with carved panels have been erected, and the floor has been raised and relaid with black bordered tiles. A new oak prayer desk has also been provided, and the pulpit repaired and remodelled. The choir, who formerly sat in the west gallery, will in future be accommodated in the new seats in the chancel. The seats were supplied by Mr. C. W. Brown, of Norwich, and the structural work was carried out by Messrs. Chaston & Grimson, of Loddon, and Mr. A. W. Perfitt, of Long Stratton, was responsible for the stonework. The whole of the work was carried out under the direction of Mr. H. J. Green, diocesan architect.

HOLY TRINITY CHURCH, ISLINGTON.—In response to a petition made by the vicar and churchwardens of Holy Trinity Parish Church, in Cloudesley-square, to the Consistory Court of London, Dr. Tristram, K.C., Chancellor of the Diocese, has agreed to issue a faculty for effecting some extensive improvements and alterations of the interior of the church. It is proposed to remove the high-backed pews; to take down the north and south galleries, enlarge the west gallery, and substitute open pews throughout; to raise (by 7 in.) the east end with the choir and chancel, so as to make one step for the Communion-table; to instal electric light, with certain other minor changes, at an estimated cost of 3,000*l.*, towards which sum 1,000*l.* is already provided. The church was built in 1826-7, after Sir Charles Barry's designs, of brick with stone dressings and tracery in the rather Late Gothic style that was prevalent at the time.

NEW CHURCH, DURRUS, CORK.—A new church was recently dedicated at Durrus. The plan of the church consists of nave, chancel, aisles, side chapels, porches, baptistry, sacristy, and organ gallery. The principal dimensions are, in the interior—length of nave and chancel, 101 ft.; breadth of nave and aisles, 45 ft.; height to ridge of nave, 40 ft. The aisles on either side are separated from the nave by five bays, forming the main arcades, which are carried by limestone pillars, with mounded caps and bases, and pointed arches, above which is the clearstory cinque foil lights. The chancel is divided from the nave by a chancel arch, springing from polished marble columns, and Bath-stone corbels and caps, all carved and moulded. The aisles are buttressed on the exterior, and are lighted by three-light pointed lancets, arranged in groups, to each bay. The roof of the nave is in pitch-pine. The chancel roof is divided into several panels by moulded ribs and the panel spaces are plastered to admit of future decoration. The porches leading to the aisles at either side and the sacristy are gable-roofed. The work has been carried out from the plans of Mr. M. A. Hennessy, architect, Cork, and the main contract was by Mr. D. Donovan, of Bantry. The high altar is by Mr. Davis, sculptor, Cork; the lead lights by Messrs. Watson, of Youghal; the iron work by Messrs. M'Gloghlin, of Dublin; and the bell by Byrne, of Dublin.

WESLEYAN CHAPEL, STAPENHILL, BURTON.—The trustees of the Wesleyan Chapel at Stapenhill have accepted the estimate of Messrs. Thos. Lowe & Sons at 2,240*l.* for the erection of a new chapel and school buildings in Ferry-street. The chapel, which is designed in the Early English style, provides accommodation for 400 adults, and consists of a central aisle and two transepts, with entrance vestibules. The north transept is designed to accommodate the organ. The school will contain 300 children, and in connexion therewith are cloak-rooms and lavatories. At the back of these buildings are provided vestry, kitchen, and heating chamber, &c. The work will be executed in red brickwork and white stone dressings, the main feature of the chapel font being a large four-light tracery window. The whole of the roof timbers inside will be of pitch pine and will be exposed, being stained and varnished. The architect is Mr. Thomas Jenkins.

CATHOLIC CHURCH, SITTINGBOURNE.—The foundation-stone has just been laid of a new Catholic church, to be known as the Church of the Sacred Heart of Our Lord Jesus Christ, the site being adjacent to the Presbytery, in West-street. The tower will be open within the nave, on one tall and two short arches; the rest of the area will be quite free from all obstruction. The chancel is to be divided by an arch, and will be apsidal in form. A small vestry is also included in the plan. The northern entrance will receive full enrichment, and on either hand and above it is proposed to place statuary in niches. The architect is Mr. W. Leonard Grant, of Sittingbourne.

ENLARGEMENT OF GOVAN SCHOOL.—An addition has been made to Albert-road School, Pollokshields, for the Govan Parish School Board. Accommodation is provided on the ground floor of the new building for a chemical laboratory, lecture-room, and also a physical laboratory and manual workshop. On the upper floor are art rooms. There are also a cookery-room and some other rooms, which will be used in the work of the school. There are separate cloak-rooms and lavatories. The school is heated by low-pressure hot water, with radiators, and fitted throughout with electric light. The Board has under consideration a proposal to erect a small astronomical observatory on the roof, in which a large telescope, the gift of a member of the Board, will be fitted up. The school was built from plans prepared by Messrs. H. & D. Barclay, architects, Glasgow, under the supervision of Mr. Samuel Preston, the Board's master of works.

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BOARD SCHOOLS, GLYN-NEATH, WALES.—The foundation-stone of new Board schools was laid at Glyn-Neath recently. The new building will provide accommodation for 320 children, and it comprises a central hall and five classrooms with board-room and teachers'-room on the first floor. It is intended to be used as a mixed school, and the cost is 3,479*l*. The building is of brickwork, faced with Morriston pressed bricks and relieved with strings of blue brick and Bath stone dressings. The floors are of pitch pine wood blocks with matchboarding dados. The contractor is Mr. David Davies, of Cardiff; the architect, Mr. J. C. Rees, of Neath; and the clerk of works, Mr. D. Richards, of Glyn-Neath.

SCHOOLS, BRECON.—Two intermediate schools in the borough of Brecon—one for 80 girl students and the other for 100 boys—were opened recently. The schools have been erected, furnished, &c., at a cost of 6,715*l*., the architects being Messrs. Phillips & Baldwin, of Cardiff and Abergavenny, the builder Mr. E. G. Groom, Llandovery, and the clerk of the works Mr. C. J. E. Large, Brecon.

INFECTIOUS HOSPITALS FOR RADCLIFFE AND DISTRICT, LANCASHIRE.—Mr. S. W. Wheaton, an inspector of the Local Government Board, held an inquiry at the Assize Courts, Manchester, on the 9th inst., into an application made by the Lancashire County Council for sanction to the borrowing of 40,000*l*. for the provision by the Radcliffe, Ramsbottom, Whitefield, and Bury Joint Isolation Hospital Committee of an infectious diseases hospital and a smallpox hospital on land at Ainsworth. Dr. Sergeant, Medical Officer to the County Council, said it was proposed to erect two hospitals on one site at Ainsworth. The site was about fifty acres in extent. There would be fifty-six beds in the infectious diseases hospital and thirty-two in the smallpox hospital. Mr. H. Lord, architect, of Manchester, said the estimated cost was 34,164*l*., the amount allowed for contingencies was 3,416*l*., architect's charge (which included clerk of works), 2,420*l*., making a total of 40,000*l*. There would be bedrooms for eleven nurses in the infectious diseases hospital, and eight bedrooms for nurses in the smallpox hospital, with dining-room, &c., and offices. There was no opposition to the scheme.

BATHS, WANDSWORTH.—New public baths were recently opened at Wandsworth by the Mayor. The requisite bath accommodation has been provided on the ground floor. Separate entrances have been provided for the men's and women's baths, the ticket office being placed between each. There are six first-class private baths for men, and sixty of the second-class; four first-class private baths for women, and eight second-class. Each of the four sets or groups has a waiting-room, lavatory, &c., and is complete in itself. The first-class bath is 100 ft. long by 30 ft. wide; the second-class bath is 85 ft. long by 30 ft. wide, and contains seventy-two dressing-boxes. A room for the storage of bicycles is provided. The total cost of the works has been about 36,000*l*. The contract has been executed by Mr. Walter Wallis, of Balham, and Messrs. Spalding & Spalding, of Queen-street, E.C., are the architects

NEW HOTEL, HUNSTANTON.—A new hotel has been erected at Hunstanton from designs by Mr. H. J. Green, of Norwich, and built by Messrs. Giddens & Perrin, of St. Ives.

SAILORS' HOME, LONDON.—The foundation-stone of the new headquarters for the British and Foreign Sailors' Society was laid recently. It will be situate at the junction of four main highways—East and West India, Commercial, and Burdett-roads. On the ground-floor there will be the American room, suitably fitted as a sailors' temperance restaurant, and smoking and attendant's-rooms adjoining. In the basement are the kitchen and store-room departments. The first-floor (reached by the main staircase) will be for the general offices, board-room, library, and literature departments. The second-front flat will comprise officers' and apprentices' rooms, with parlour, sleeping accommodation, and bath-room. The next floor will contain navigation-room, leading up to the observatory, with rooms for the superintendent and workers. The main entrance will lead through a corridor into the Albert Victor Sailors' Rest in the Gill-street side of the home. Above the hall, with another entrance from Gill-street, are dormitories for seamen, with bath and lavatories complete. Messrs. Niven & Wigglesworth, are the architects.

IMPROVEMENTS AT THE THEATRE ROYAL, SHEFFIELD.—During the summer closing of the Sheffield Theatre Royal some alterations and improvements are to be made. The stage is to be enlarged by taking in a good deal of space at the back. The electric light is to be introduced. New dressing rooms, also, are to be built. The alterations are being made under the superintendence of Mr. Frank Matcham.

NEW PIER PAVILION, DOVER.—On the 15th inst. the new Pavilion on the Promenade Pier was opened to the public. It consists of a concert hall, 85 ft. by 50 ft. with seating accommodation for about 950 persons. Dressing rooms, refreshment bars, shop, and pier master's room are also provided in the building. The hall is roofed in one span with semi-circular steel trusses carried down to the pier girders, and there are no columns to obstruct the view of the platform. The cost of the scheme, which includes the revising and strengthening of the understructure of the pier, has been about 6,600*l*. The work was executed in seven months by Messrs. Anthony Fasey & Son, of Leytonstone, from the plans and under the superintendence of Mr. M. Noel Ridley, engineer, and Mr. Robert J. Beale, architect, whose joint design was selected in competition.

PARISH CHURCH HALL, ST. ANDREWS.—It is proposed to erect a parish church hall at St. Andrews. It will have a frontage to the south and will have a vestibule at the south end, with a staircase to a gallery over, and a platform at the north end. The adjuncts consist of a classroom for bible class, minister's-room, retiring-rooms, and a kitchen for use at social meetings, with the usual lavatory accommodation. The height of the hall will be 15 ft. to the wall heads and 26 ft. to the ceiling. The exterior walls will be of local freestone, and the roof will be covered with green Scotch slating. The hall will provide accommodation for over 400 scholars. Messrs. Gillespie & Scott, St. Andrews, are the architects, and the following are the contractors:—Mason work, Mr. Thomas Liddell; joiner work and seats, Mr. Andrew Cunningham; slater work, Messrs. Rintoul & Mackie; plumber work, Mr. Thomas Peebles; and plaster work Mr. A. R. Macpherson—all of St. Andrews.

ASSURANCE COMPANY'S NEW BUILDINGS, PERTH.—The new buildings in Perth which have been erected by the General Accident Assurance Corporation, Limited, occupy the site of the old post office. The principal entrance is from High-street, and leads into the general office, which occupies nearly the whole area of the ground floor. The office is seated for about 100 clerks. On this floor there are also assistant manager's room, rooms for the heads of the departments, telephone room, and post office. Marble pillars support the second floor. At the back of the general office is a service stair running from the basement to the top floor, with an electric lift for the staff. The clerks' entrance is from Tay-street. On the mezzanine floor the lady typists' room is situated. From the general offices rises the grand staircase. It is constructed of Sicilian marble and wainscot oak. At the foot of the stair is a marble arch, with two modelled bronze figures. The windows on the stair are by Messrs. Ballantine & Gardiner, Edinburgh. They represent England, Scotland and Ireland, with the conventional treatment of the rose, the thistle, and the shamrock. In the centre are the arms of the City of Perth, supported on either side by those of the Chairman and Sir R. D. Moncreiffe. On the first-floor landing is the fire department, seated for between forty and fifty clerks. The general manager's room, board-room, and ante-room are situated on the same floor; but are cut off from the main staircase by a private entrance and lobby. There is also the keeper's house of three apartments. The top flat is used for storage purposes. There is an extra clerk's room on the second floor seated for about sixty clerks, and a clerk's luncheon-room. In the basement are storerooms and packing-rooms, heating chamber, workshop, and three fire and burglar-proof safes, which are reached by a stair from the general office. The following were the contractors:—Masons, Messrs. R. Brand & Sons, Perth; joiners, Messrs. J. Hay & Son, Perth; plasterer, tiles, and paving, A. M'Ritchie, Dundee; plumber, James M'Leish, Perth; slaters, Messrs. J. Buchan & Son, Perth; painters, Messrs. Stalker & Boyd, Perth; special decorators and furnishers, Messrs. Cowton & Sons, London; heating and ventilation, Messrs. James Simpson & Co., London; electric bells, Messrs. Westwood & Co., Perth; electric lighting, Messrs. Frew, Watson, & Co., Perth; marble work, Mr. Thomson, Princes-street, Perth, and Messrs. Galbraith & Winton, Glasgow; stone-carver, William Sheriff, Glasgow; wood-carver, John Crawford, Glasgow; iron work, Messrs. Mather & Son, Edinburgh; glaziers, Messrs. G. R. Douglas & Son, Perth; electric hoist, Messrs. A. & P. Steven, Glasgow. The architect was Mr. G. P. K. Young, of Perth; and the inspector of works, Mr. G. Henderson, Perth.

WORKMEN'S HOME AND CLUB, LIVERPOOL.—According to the *Liverpool Post*, buildings are being erected in Liverpool by Mr. B. W. Levy out of the moneys of the David Lewis Trust Fund. The object to be achieved is the provision of a Workmen's Home and Club and Public Hall, somewhat on the lines of the People's Palace in London. The site is the land upon which old St. James's Market stood, and it has its main frontage in Great George-place, its side fronting to Nile-street, and its back in Rathbone-street. The cost, it is stated, will run to close on 50,000*l*. Mr. J. Francis Doyle is the architect, from whose designs and under whose superintendence the building is being erected. The main frontage to Great George-place will extend to 174 ft. The side frontage in Nile-street will have a length of 146 ft. In all, the site of land embraces 220 ft. by 176 ft., and the buildings will be set back from the boundary some 21 ft. The materials used in the facing of the main outer walls will be of special brick and terra cotta, with green slates on the roof. The main entrance to the public hall and clubroom will be from Great George-place, and will be 12 ft. wide. This means of ingress will have a hall 50 ft. by 20 ft., arched and finished in tiles and faïence. In regard to the public hall, which will be 90 ft. by 42 ft. and 35 ft. high, it will be in the centre of the building, and will accommodate upwards of 800 persons. It will have a separate stage entrance from Rathbone-street, stage boxes, gallery, and green-rooms for both sexes. All the staircases and floors will be fireproof. Respecting the social club, it is arranged that this shall consist of a number of large rooms—a billiard-room, 67 ft. by 30 ft.; two committee-rooms, three social clubrooms, each 50 ft. by 26 ft., and also a special clubroom and toilet facilities for females. To the south of the clubroom, on the same site, space is left open for the subsequent erection of a gymnasium, 132 ft. by 54 ft. The Home will be approached and entered from Nile-street, off Great George-street, through turnstiles. Just over the threshold the visitor will find himself at the office, and adjacent to this will be the master's house. The reading-room will be 50 ft. by 20 ft. In a central position between this room and the dining-room, with an area of 20 ft. by 15 ft., will be the provision shop. There will be lifts connecting the shop with the kitchens in the basement. The dining-room will be 80 ft. by 41 ft. The kitchens, sculleries, pantries, and stores will be in the basement. In the basement will also be lockers, and storerooms for the accommodation of the things belonging to the boarders at the Home. On the upper floors, approached from the large main staircase by three independent gangways, will be the sleeping cubicles. These will be arranged in groups for easy working and control. There will also be two other stone staircases for exit in cases of necessity. The number of cubicles for which arrangements have been made in the designs is 381. Over the billiard-room will be a flat roof, which it is intended shall be for the use of the men who sleep in the Home. The work of erection has been entrusted to Mr. Isaac Dilworth, the clerk of the works being Mr. J. W. Gilling.

HOTEL, SOUTHWOLD.—The Grand Hotel, Southwold, was opened on the 10th inst. The site chosen is at the extreme end of the town, in close proximity to the pier, which was opened to the public last summer. The hotel consists of a main block, nearly 140 ft. in length and of five stories in height. The building was designed by Mr. C. H. M. Mileham, of Lincoln's Inn-fields. The contractors were Messrs. Kerridge & Shaw, of Cambridge.

FOREIGN.

FRANCE.—The Municipal Council of Paris have approved of the erection of a statue of the Empress Josephine, by M. Vital Dubray, on the rond-point of the Cours-la-Reine; and also of a statue to Verlaine in the Square des Batignolles.——The Council has also decided on the erection, on the Place Dupleix, of a large building for the accommodation of workmen's syndicates, under the name of the "Palais du Travail." M. Philippon is the architect, and the cost will be about 675,000 fr. —— M. Ferret, Departmental Architect at Bourg, has been appointed President of the Société Regionale of Architects of the Saône.——Important public works, at an estimated cost of 388,000 fr, are to be undertaken at Montauban. They include the clearing away of the houses round the church of Saint Jean, and the restoration of the Hôtel de Ville and of the Hôtel Bonnecaze.——A sum of 26,000,000 fr. is to be expended on the enlargement of the port of Dunkerque.——Before separating at the close of the session, the Council of Paris passed a vote for the purchase of works from the two Salons. Among these are the "Reveil," by M. Jacques Blanche; a portrait, by M. Aman Jean; "La Terre Antique," by M. Ménard; "Devant la Mer," by M. Jean Boucher; "L'Enigme," by M. Moncel; a bronze lion, by M. Cordier; works in pewter by M. Baffier; a fine cameo by M. Tonnelier, &c. The total value of the purchases amounts to 114,200 fr.——M. Germain, the sculptor, has just completed the models for four electric candelabra which are to complete the decoration of the façade of the Opéra Comique. These consist of heavy columns of red Scotch granite, adorned with bands and olive branches of hammered bronze. These carry four branches, each with three electric globes.——In the Section of Architecture, at the Académie des Beaux-Arts, M. Batigny, architect, of Lille, has been appointed a corresponding member in place of the late M. Révoil.——The Paris Council has decided to continue the large intercepting sewer from Clichy, which now ends at the Place de la Trinité, as far as the Rue des Petits Champs. The operation will cost about 1,370,000 fr.——The death is announced, at the age of seventy-one, of M. Edouard Krug, painter, author of numerous religious and allegorical pictures. He exhibited, a few years ago, an immense canvas in which were grouped all the persons, Norman and Bretonne, who are members of the Society called "La Pomme." He obtained medals in various salons, and a bronze medal in the great exhibition of 1889.——M. Albert Alexandre Vergnon, architect, of Paris, has died at the age of fifty-four. He was a pupil of the atelier André.

GERMANY.—A monument erected to the memory of the late Emperors William and Frederick was recently unveiled at Soran, in Silesia. It consists of two statues of the emperors mounted on pedestals; they are represented as being in the uniforms of Prussian generals. The monument is about 20 ft. in height.——A tower erected to the memory of Prince Bismarck, at Coburg, was recently unveiled

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in the presence of Princess Beatrice and the Prince Regent of Saxe-Coburg and Gotha.

AUSTRIA.—A statue representing the late Empress of Austria was unveiled at Salzburg on the 15th inst. in the presence of the Emperor and several other members of the Austrian Royal Family. The statue, of white marble, is by Professor Hellmer, and depicts her late Majesty when in her prime. It stands on a low pedestal, the front of which bears the simple inscription, "Elizabeth, Empress of Austria," whilst the sides are adorned with verses by the Austrian poetess, Marie Ebner von Eschenbach.

ITALY.—It is reported from Rome that in the course of the restoration work in the Palace of the Duke of Massa Carrara, at Carrara, there have been discovered two magnificent frescoes by Raphael. These frescoes fill two large spaces of the wall in an apartment in the building.

SANITARY AND ENGINEERING NEWS.

NEW SEWERAGE WORKS, LONDON COUNTY COUNCIL.—The London County Council propose to acquire by compulsory sale thirty-six acres of land in the parishes of Erith and Plumstead for the construction, as part of the main drainage and sewerage of the Metropolis, of two outfall sewers, one of them to be below ground and the other above ground covered with an earthen embankment, so as to provide for the increasing flow of sewage from the area lying on the south side of the river Thames.

PLUMBERS' REGISTRATION.—The House of Lords has given a first reading to a Bill introduced by Lord Glenesk entitled "An Act for the Registration of Plumbers." It was set down for second reading on Thursday, and there was no notice of opposition. This measure, of which Lord Glenesk is taking charge, is similar in substance to those read a second time in the House of Commons in 1892 and 1897 and reported on by a Select Committee and the Standing Committee on Trade in those years respectively. The object, of course, is to establish a system under which plumbers can, if they please, be registered. No privilege is proposed to be given by the Bill to registered plumbers, but a plumber is prohibited from calling himself a registered plumber unless he is registered under the Bill. It will be necessary for a plumber before he is registered to be qualified to the satisfaction of a council approved by the Local Government Board. This will enable persons employing plumbers to satisfy themselves, if they desire to do so, that the persons they so employ have given evidence of their qualification for the work. The control of the registration system and the selection of qualifying examinations will be in the hands of a general council constituted under a scheme to be framed by the Local Government Board, and consisting of members representing master and operative plumbers, Local Authorities, and various sanitary associations. Sub-section 5 of Clause 3 provides that "Any scheme made under this Act shall be laid before both Houses of Parliament as soon as may be after it is made, and if, within the next subsequent forty days on which either House has sat that House presents an address to his Majesty praying that any such scheme may either in whole or in part be annulled, his Majesty in Council may annul the same either in whole or in part as the case may require, and the scheme or part annulled shall thenceforth become void without prejudice to the validity of any proceedings taken under the same in the meantime. If the first scheme framed by the Local Government Board is so annulled, the Local Government Board shall within ——— months frame a further scheme, and so on as occasion requires."

MISCELLANEOUS.

FERRY WORKS, QUEENSFERRY.—Mr. Bulkeley Creswell, the architect of this building, illustrated in our last issue, writes to ask us to correct the spelling of his name, which we gave as "Cresswell." We may say, what applies to this and other cases, that mistakes as to the spelling of a name often arise from correspondents not taking the trouble to write their signature clearly.

ST. MARY CHURCH, HARROW.—A faculty has been granted by the Consistory Court of London in respect of the parish church, Harrow-on-the-Hill. The faculty authorises the re-building and enlargement of the organ that is now in the north chapel, the making of a new window (to be filled with stained glass) in the clear-story above the archway (inserted at the end of the thirteenth century) that opens from the north aisle into the north transept, similar to the seven other clear-story windows, and the refitting and reglazing of the lancet windows in the south side of the chancel, five of which were found and restored during the recent remodelling of the east end of the church. The faculty will also provide for the shifting of some of the monuments and memorial tablets, amongst them being the monument erected in 1669 to William Gerard and his sister. For particulars of the clear-story and of the Early English windows in the chancel, see our leading article of January 26, 1895.

ST. GILES'S CHURCH, CRIPPLEGATE.—A faculty has been granted by the Consistory Court of London for carrying out some alterations of the church, to include the erection of a porch and the setting up at the east end of the north aisle of the reredos formerly in the church of St. Bartholomew, Moor-lane, which is now being demolished. In the reredos are panels with the Ten Commandments upon them; for these will be substituted a picture of the Presentation of Christ in the Temple, and the Ten Commandments will be put at the west end of the church, there being no space for them in the customary place, which is occupied with monuments.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual summer excursion organised under the auspices of the Bristol Master Builders' Association took place on the 9th inst. Saloon carriages conveyed the party to Chippenham, which was reached soon after ten o'clock, and breaks were in readiness to take the party to Bowood Park. The drive through the richly-wooded country was very pleasant, and the seat of the Marquess of Lansdowne was much admired. The drive was continued to Avebury, with its historic stones and ditch, though these were left until luncheon had been partaken of. The drive to Lacock was most enjoyable, and through typical Wiltshire scenery. The visit to Lacock Abbey proved very interesting. A four miles journey brought the party back to the Angel Hotel, where the dinner was held. Mr. E. Walters presided, and the vice-chairs were taken by Messrs. G. Wilkins and G. Humphreys. After the usual loyal toast, Mr. W. H. Brown proposed the toast of "The National Federation of Building Trade Employers of Great Britain and Ireland," and said he had to associate with it the names of the well-known builders, Mr. A. Krauss and Mr. Frank N. Cowlin. The former was President of the National Federation, while Mr. Cowlin was the energetic treasurer of the South-Western Federation. Such associations as theirs filled a useful place in their trade, and they also provided them with enjoyable outings like they had had that day. Mr. A. Krauss, in reply, gave some particulars of the recent meeting of the Federation at Glasgow. It was his good fortune, as President of the Federation, to be received by the Lord Provost at the Exhibition, and he gave their Federation a hearty welcome. They were also shown over the municipal buildings, and there they saw a magnificent structure, such as they could not hope to have in Bristol. One result of the Glasgow meeting was that a fresh effort would be made to amalgamate with kindred associations, so that they should have a united body representing the United Kingdom. Some of those present might be invited to join the committee to go into that question, and he relied upon their loyal support. As they knew, there had been a call on behalf of the National Association, to which the North of England contributed 100*l.*, and he was very glad to have a cheque from Mr. Cowlin on behalf of the South-Western Federation for 62*l.*—Mr. F. N. Cowlin also responded, and said it gave him great pleasure to be treasurer of the South-Western Federation. That organisation had had a great many difficulties, but these had been surmounted, and he felt certain that in the future the Federation was going to be of great benefit to the trade in their district. When they regarded the comprehensive nature of the organisation of their employés, the necessity of such a federation as theirs was apparent. He looked forward to the time when their organisation would be so strong that they would be able to refer the regulation of various trades connected with their business to a joint committee of the employers and the trade-unionists, and under those circumstances he believed such a thing as a strike would be unknown. Such a body would be the solution of the difficulties which at present existed between capital and labour, and it would tend to restore English work to its proper place in the competition with the world. Mr. Geo. Wilkins proposed the toast of "The Visitors." Mr. G. H. Perrin and Mr. W. H. Jelly (Bath) replied to the toast. Mr. Geo. Humphreys proposed the toast of "The Chairman," and Mr. Walters made a fitting reply. The party returned by the 8.35 train from Chippenham, arriving in Bristol just before ten o'clock.—*Bristol Times.*

THE WEST FRONT OF PETERBOROUGH CATHEDRAL.—The funds for the memorial of the late Dean of Peterborough have come in so satisfactorily that the Cathedral Restoration Committee have given an order for the work of completing the restoration of the west front to be proceeded with forthwith. This includes the repair of the great central arch and gable, the two turrets flanking the same, and also the pointing pinnacles of the bell tower. It is hoped, therefore, that the scaffolding which has for more than four years disfigured the beauty of the grand old edifice will soon be removed. About 500*l.* are still needed.—*Daily News.*

TUSCAN COPPER AND LEAD: RESUMPTION OF WORKINGS. — Some highly important mining operations in lead and copper ores have recently been begun at Lanzi, near Campiglia, in the south of the province of Pisa. It is not a case of the discovery of new ores, for these mines were known to the Romans, as is witnessed by abundant tracings of their workings all along the copper veins, and they have also been somewhat fitfully worked under different owners during the present century. But the surprisingly rich and valuable nature of the mines has only now fully come to light. The property, which is some 1,350 acres in extent, was recently acquired by a London syndicate, and is now owned by a company styled "The Etruscan Copper Estates, Limited." The geological conformation of the estate is clay slate, overlain by a bed of marble of the average thickness of 400ft. The metallic resources of the property consist of five fissure lodes of phenomenal proportions, one of lead (sulphide of lead and zinc blende) and four of copper (sulphides of copper). Each one of the lodes is over 100 ft. wide, the lead lode being 110 ft. and one of the copper lodes as much as 130 ft. in width. This fact alone is sufficient to show that the quantity of ore available must be enormous. The lead and zinc ore is now being raised in considerable quantities and has the appearance of being rich in metal, but it is too early yet to give an estimate of the metallic contents of the vein, as the work so far has only progressed to a short depth. It is evidently the intention of the present owners to develop the mines on a large scale. New hands are being put on every week as room is made for them in the workings, and the engineer estimates that he will have 1,000 men at work in twelve months' time. None of the ores will be exported, the company having decided to erect large smelting works and themselves reduce all the ores to metal. The company's exports will all have to pass through Leghorn, the nearest convenient port of importance, and it is expected that that city will eventually benefit largely by this latest venture of British enterprise and energy in the Peninsula.

CAPITAL AND LABOUR.

BRADFORD BUILDING DISPUTE.—At the meeting of the Bradford City Council on the 9th inst., a recommendation of the Finance and General Purposes Committee was submitted that no works should be allowed to proceed under any Corporation contracts except at the standard rate of wages last mutually agreed upon between masters and workmen. Ald. Ratcliffe moved the adoption of the Finance Committee minutes, but reserved his right to vote against that portion given above. Ald. Wood seconded, with a similar reservation. Mr. Thos. Whiteley moved an amendment to the effect that the minutes be adopted, with the exception of the resolution alluded to, which Ald. Popplewell seconded. On a vote, the amendment referring the resolution back was carried by 43 votes to 22.

MASONS' STRIKE, BURTON.—The strike of the stonemasons of Burton was brought to a termination by the men resuming work on the old terms. In the early part of the year the men gave six months' notice for an advance in wages from 8½d. to 9½d. per hour, and certain alterations in the rules of working. As these were not conceded, they came out on strike at the commencement of the month. Negotiations have since been going on between the employers and the men. The masters held that the present state of trade did not justify any concession being made. The masters' society received a letter on the 9th inst. stating that at a meeting it had been decided to resume work on the rules of July 1, 1897.

TEES-SIDE JOINERS' DISPUTE.—A settlement has been effected in regard to the dispute between the Tees-side and Hartlepools Master Builders and the Tees-side and Hartlepools District of Carpenters and Joiners over the question of wages. The men ceased work about two months ago because the employers declined to advance their wages from 9d. to 10d. per hour. The masters offered ½d. per hour at the time, but the men refused to accept this. Since then there have been repeated negotiations between the two parties, with the object of coming to a settlement. Finally the masters advanced their offer to ½d. per hour, conditionally upon the men agreeing to an alteration of rules, stipulating that the rules in force in the Sunderland district should be adopted. This arrangement has been agreed to and a settlement has been effected. About 400 men altogether have been affected, the district comprising Stockton, Thornaby, Middlesbrough, and the Hartlepools.

LEGAL.

POINT UNDER THE LONDON BUILDING ACT, 1894.

THE case of the London County Council *v.* Ellis came before a Divisional Court of King's Bench, consisting of Justices Darling and Phillimore, on the 12th inst., on a motion on behalf of the defendant calling upon Mr. d'Eyncourt, the Metropolitan Police Magistrate, to show cause why he should not state a special case for the opinion of the High Court. It appeared that the Council had issued two summonses against the defendant for alleged contravention of the London Building Act, 1894, in erecting a building beyond the general line of buildings. The defendant Ellis had an old building at the place in question, and he started to erect two other buildings, but the Council took objection to this on the ground that, if he erected them as a separate structure, he would commit a contravention of the Act by building beyond the building line. The defendant then seemed to have made an

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extension of the old building but the magistrate found as a fact that there were really two buildings and ordered the demolition of the new one. It was said that if it was an extension of the old building, its erection was not a contravention of the London Building Act. Mr. d'Eyncourt refused to state a case on the ground that the point was a frivolous one. Hence the present motion on behalf of the defendant.

Mr. Justice Darling considered that no ground had been shown for ordering a rule and that the magistrate was right in holding that the point was a frivolous one.

Mr. Justice Phillimore concurred and the application was accordingly refused.

Mr. R. Cunningham Glen appeared in support of the application.

On Monday, the 15th inst., Mr. Glen, in the Court of Appeal composed of the Master of the Rolls and Lords Justices Vaughan, Williams, and Stirling, moved, *ex parte*, on behalf of Mr. Ellis for a rule *nisi* calling on the magistrate to show cause why he should not state a case for the opinion of the High Court. The learned counsel having stated the facts,

The Master of the Rolls asked if the learned counsel contended that this was an appealable matter.

Mr. Glen said the rules laid down that when an *ex parte* application was made to the Divisional Court and refused, a similar application could be made *de novo* to the Court of Appeal.

The Master of the Rolls: You did not think fit to come here in the first instance? You tried first the Divisional Court?

Mr. Glen replied that the proceedings were in the nature of a mandamus, and an application could be made to the Court of Appeal *de novo* when refused by the court of first instance.

The Master of the Rolls: Why did the Divisional Court not grant you a rule?

Mr. Glen: Because they agreed with the magistrate that the application was frivolous. The points of law were raised before the magistrate, and he, having taken three weeks to consider those points, afterwards decided they were frivolous. I submit they are not frivolous. It is a very serious matter to the applicant because he will have thrown away 2,000*l.* if he has to demolish these buildings.

After further discussion the Master of the Rolls said he thought the best plan would be for the Court to grant a rule *nisi* calling upon the magistrate to show cause why he should not state a case because the matter was of great importance to Mr. Ellis, as it involved the pulling down of a building which had been erected if the order stood. It must not, however, be understood by the Court granting a rule that the Court considered the points of law taken on behalf of Mr. Ellis were not frivolous. The magistrate might be able to satisfy the Court that the points of law taken were frivolous, and then the order *nisi* would be set aside. In these circumstances, he thought the application should be allowed, and that the costs of this application had better stand over until the matter was decided.

The Lords Justices concurred.

Order accordingly.

CASE UNDER THE LONDON BUILDING ACT, 1894.

LONDON COUNTY COUNCIL *v.* GARDINER: BAD MORTAR.

AT the Woolwich Police-court on the 5th inst., before Mr. d'Eyncourt, the magistrate, Frederick Gardiner, of 21, Bostall Hill, Plumstead, was summoned by the London County Council for using mortar in the erection of a building in Grosmount-road, Plumstead, not composed in accordance with the by-laws of the London County Council; he was also summoned by Mr. Batterbury, District Surveyor for Plumstead and Eltham, for non-compliance with notice to amend certain irregularities committed on such buildings in Grosmount-road.

Mr. Andrews (solicitor) prosecuted for the London County Council; and Mr. Tyrrell, instructed by Mr. Llewellyn Davies, appeared for defendant.

Mr. Batterbury gave evidence to the effect that on March 4 he took samples of mortar from between the bricks of the walls and another from the mortar bed. All samples were found to contain an insufficient quantity of lime and to contain earthy matter. The Council's by-law required that the mortar should be composed of one part lime to three parts sand or grit. Notice was served on the defendant to take down the wall built with the bad mortar, but he did not comply with that notice, nor with a second one served later on, but went on carrying up the walls of the building. The mortar in question was rotten and would never bind the bricks. A portion of the wall was blown down. The composition of the mortar used by the defendant was such as to render the wall weak and unsafe.

Mr. E. W. Knight and Mr. Conder, District Surveyor of Woolwich, also gave evidence.

Mr. Grimwood, Chief Assistant Chemist to the London County Council, spoke as to the analysis of seven samples of the mortar, showing that they contained from 6·4 to 12·0 of earthy matter, from 2·0 to 9·9 of carbonate of lime, from 68·8 to 76·0 of grit, and from 2·7 to 6·6 of lime (CaO), and that the proportion of commercial lime (of 80 per cent. CaO) to sand and grit by volume varied from 1 of lime to 5·2 of grit, &c., to 1 of lime to 10·9 of grit, &c., and stated that none of the samples were in accordance with the Council's by-laws.

For the defence, it was urged that the mortar, although dark in colour, was sound. As it was difficult to get sand, sifted gravel, which contained a good deal of grit—obtained in the neighbourhood—was used in its composition.

Some workmen were called to speak as to the good quality of the mortar, one of whom caused great merriment by stating that he had seen better mortar, and then, when questioned, candidly admitted that he had never seen worse.

Mr. Tyrrell asked the Court not to adopt the drastic course of ordering the demolition of the building.

Mr. Andrews pointed out that it was the defendant himself who had brought about his present position by going on with the work after he had received notice then and there to remedy what had been complained of. But he would consent to an adjournment, if the defendant would undertake to give every facility for the District Surveyor to take samples of the mortar in those portions of the walls built after the notices had been served upon him to ascertain whether the mortar used in those portions was of any better quality than the mortar complained of.

The defendant having given the undertaking stipulated, Mr. d'Eyncourt adjourned the summonses *sine die*, but with the understanding that the case must be entered within two months.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

5,065.—JOINTS FOR DRAIN AND OTHER PIPES: *J. A. Reid.* — Additional annular recesses are fashioned at the socket and spigot ends respectively of the pipes, which can be more readily laid by resting them upon chairs, jointing material is then filled in the spaces between the pipe-ends.

5,080.—A MICROMETER GAUGE: *W. H. Lock and H. Isherwood.*—A ram mounted upon a screw-threaded spindle, and certain screw-threaded tubular parts, constitute the gauge. A feather prevents the ram from rotating. The advance or retirement of the ram is effected by turning a thimble, and the rate of that movement will be in ratio to the sum of the pitches of the right and left handed screw threads, but the movement of the ram will become due to the difference of the pitches when another thimble is turned. To the former thimble is screwed a spring-bar, of which the nose will engage with a slot cut lengthwise in the hub whereby the thimble will be locked so that its index mark shall be in line with a scale graduated upon the hub that gives the largest readings, another scale gives medium readings, whilst a scale upon the latter thimble gives the smallest readings.

5,083.—SCREW FANS FOR USE IN MINES: *C. P. Kenyon.*—The inner ends of the radial arms that carry the blades of screw fans are fastened with set screws and the blades are spread out at their peripheries with screw bolts for reducing their pitch, whilst a ring engages with recesses cut in the outer faces of the blades. Beams sustain the fan within the shaft, and eddies near the axle are obviated by means of a hanging cone.

5,098.—PROCESS OF MOULDING BRICKS: *Hall & Boardman & Hall.*—The bricks are impelled from the cutting-table or machine on to sliding sections or blocks, from which they are separated with levers, and are then forced from the sections on to a pallet and conveyed to the drying-shed. The blocks or sections, which slide upon guiding-rods, are joined to levers with cranked arms, the parallel levers being joined to links, and their lengths being extended from the middle outwards, so that the outer blocks shall acquire an increased rate of speed. Instead of the last-mentioned arrangement, however, the blocks can be set so as to slide outwards at each side of a fixed section, and to slide all together in one direction from a block fixed at their end.

5,142.—AN APPARATUS FOR CALCULATING THE SECTIONS OF BEAMS, COLUMNS, GIRDERS, &C.: *W. Dohm.*—A frame, to the central point of which a radial arm is attached, is formed of a base and a semi-circle; the T-head of an index-rule slides along the base, and screws clamp the radius-arm and the indicating-rule; scales for I-beams, together with other scales, are provided.

5,149.—A SCARIFIER FOR MACADAMISED ROADS: *W. Lambert.*—For an improvement upon the machine specified under No. 28,970 of 1897, the inventor mounts the frame upon two sets of ballast and steering wheels; the latter are carried by forked steering-shafts joined to the draw-bar with nuts and toggle-levers in order that the machine shall when propelled, repose upon one set of wheels, but, when drawn, upon the other set. When it is not being used the tines are fixed with stops; the tine-holder, or tumbler, is worked with a connecting-rod that engages with the draw-bar. For purposes of steering check-pins are to be inserted into holes in the steering-quadrants, of which the forked ends embrace the steering-shafts.

5,161.—A TRIPOD STAND FOR SURVEYING INSTRUMENTS, &C.: *C. de Redon.*—For reducing the adjustable top to small compass it is made of four frames, which are hinged to one another at different sides in such a manner that the top which carries the instrument may be levelled with screws; on the base-board are three brackets, to which the legs are joined with pins passed through holes in the brackets, and in projections from plates that are secured by means of bayonet joints to the legs; each leg is formed of an elastic band wound helix-wise, and has a point which is fixed in a hard-wood block fastened to the metal band; for increasing the stability of the tripod a cord from the middle of the base-board is secured in the ground with a fork.

5,169.—A MACHINE FOR LAYING BRICKS AND MORTAR: *F. H. Knight.*—A telescopical shoot or endless band feeds the bricks to the machine (see No. 21,823 of 1899), whilst an upper weighted or spring roller, together with side rollers, either mounted upon telescopical spindles or lowered for laying the ground course with spindled extensions, press the bricks together in their places; a bevel and spur gearing drives the rollers at a rate faster than that of the machine, and can be inclined for raising the bricks over the mortar; a spring draws the rollers inwards, or one of them may be mounted upon a pivoted arm which a spring draws inwards, and the other may be attached to a fixed spindle; the spur gearing has a friction-clutch that will slip as soon as the rollers have pressed a brick into position; as the handle of the machine is turned, a sprocket-wheel will run upon a chain which is secured to a girder that is held up with struts and brackets, and is vertically adjusted with wheel-nuts and screws; rubber rollers, pneumatical tyres, or endless bands prevent the mortar from escaping from the joints, and a scraper takes away the superfluous mortar.

5,179.—A TOOL FOR USE IN MAKING PIPE JOINTS, &C.: *F. G. White.*—A tool for compressing the joints of leaden pipes, the sheathing of electrical cables, and so on. The surfaces, being coated with mercury, have dies that are attached loosely with pins (which are passed through slots) to recesses cut in the pivoted arms. In another shape, tubular dies are set around the amalgam-covered flanges of the pipes, and are split, with tapered outside surfaces which similar surfaces will force into the recesses of the pivoted arms. The method of jointing is specified in No. 5,176 of 1900.

5,193.—TREATMENT OF WOOD: *G. F. Lebioda.*—The apparatus is devised for impregnating the fibre of tree trunks, railway sleepers, and timber in general, with dyeing, fireproofing, preserving, and similar solutions. A closed container, having a hinged end, receives the logs, into the ends of which are forced cups, having sharp edges, by hydraulic pressure. Tubes join the cups to a chamber, and the interior of each cup is joined to another chamber. Pressure into the inner chamber draws out the cups. When the cups have been forced into the timber ends, the casing is charged with a solution under great pressure, and the residue is then drawn away. The solution may be afterwards forced through the wood in the reversed direction.

5,249.—BURNERS FOR VAPOUR AND GAS: *J. Sala.*—The gas or oil feed-tube is inserted through the base of the casing of the burner (which can be used with gas) and its connecting-piece joins the burner to the lamp, heat-conductors are passed through a gauze cover of the top of the burner and inside the burner-tube which has a double outer casing that, for the use of liquid fuel, is heated with a small lamp which starts the burner, when the liquid fuel becomes vaporised and the hot air and vapour ignite over the gauze.

5,253.—MEANS OF FLUSHING AND DISINFECTING DRAINS: *J. E. Lewis.*—For flushing purposes a tipping-tank is placed within a chamber that communicates by a passage with the drain, the discharge from the tank that contains the disinfectant is controlled with a cylinder around which are pockets that, as the cylinder revolves, will fill and discharge alternately into the flushing tank. For rotating the cylinder is arranged a float that moves in guides and has a rack for engagement with a pinion and pawl upon the shaft of the cylinder which is thereby worked by only the ascent of the float.

5,271.—A CIRCULAR SAW MACHINE FOR CUTTING LATHS AND STRIPS: *B. Leitmayr.*—The wood to be sawn into thin laths or strips is clamped on to a slide worked with a rack and pinion that run loosely upon the shaft, and which a clutch throws into engagement as a roller upon the slide in its movement backward strikes an inclined plane upon the clutch-lever, a shoulder upon a spring-lever locks the end of the clutch-lever, and the slide and wood are fed forwards until a stud has pressed the spring-lever back, thereupon a weighted lever sets the clutch free and a weight returns the slide, which is provided with stops for moving a lever which keeps the wood away from the saw during the return stroke. As soon as all the wood has been sawn, a spring that forces it against the fence strikes a stop for permanently disengaging the clutch, another inclined plane forces back the laths as they are cut off the wood.

5,279.—BALL-AND-FLOAT VALVES: *J. W. Dickinson.*—This apparatus is adapted for a high-pressure service; at the end of the float-arm is a forked extension-piece pivoted on to a casing that slides

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and on to two swinging arms which are pivoted on to the supply-pipe; the valve is sustained by the casing which slides upon the end of the supply-pipe, whilst the leverage exerted by the float forces the valve firmly against the supply-pipe.

5,285.—EXPANDING GIRDERS: *H. B. James.*—The inventor has devised an expanding girder for use in the construction of roofs, piers, bridges, fire-escapes, elevators, &c.; and in window-cleaning, lamp-lighting, and so on. The girder consists of pivoted bars, joined with cross-rods to parallel bars, in the form of a "lazy tongs"; the lower ends of the lower bars are attached to the support and move on guided rollers respectively, the upper ends of the upper bars are secured to a platform, and move a slider upon it, respectively. On the platform is a hand wheel for turning a screwed rod that works the slider; in another form the lower ends of the lower bars roll in guides upon the support, their ends being attached to spring or hydraulic power regulated pistons, or for the cross-rods may be substituted cross-levers, disposed in the "lazy-tongs" fashion, and the guides for the ends of all the bars are set diagonal-wise; for bridges a girder after the kind specified is expanded from either bank horizontally, the opposite platforms being fastened together.

5,288.—PAPER SEAT-GUARDS FOR WATER-CLOSETS: *D. Grant and A. Macpherson.*—Underneath the seat, which is cut radially to a small disc, is fastened a ring of paper, and upon a hanging strip are made pockets which the flush will fill with water, the used guard being thus washed away. A wire spring frame holds down the cover, and the front edge of the seat is clipped by the frame so that when the closet is used the middle part of the cover becomes burst open. Tags serve for drawing the guards from their holder, which is secured to the wall.

5,290.—AN APPLIANCE FOR SCREW-DRIVERS: *F. Gude.*—The spindle to which the blade is affixed has a cross-handle and screw-head which engages with the head that is mounted upon three legs rising from a base; the legs and the head are joined by means of spring-nuts. The workman stands upon the base and inserts the blade into the nick of the screw as he slackens the nuts and raises the spindle.

5,297.—MEANS OF STRENGTHENING CEMENT AND SIMILAR PIPES: *G. H. F. E. M. Drenckhahn and C. H. A. C. Sudhop.*—The top, bottom, and side walls of the pipes are strengthened by being thickened, or by inserting some such resistant material as hoop iron, wire, &c., in the section of the pipe that it may lie near the inner wall at the crown and sole but near the outer wall at the sides, and strengthening metal pieces are placed lengthwise within rib-shaped crossbands.

5,417.—SIPHONICAL DISCHARGE: *T. W. Woodhouse.*—A reduced opening, which is formed by fitting the upper edge of the well either wholly or partly with a flange, takes the lower portion of the bell which (for starting the flush) is firstly lifted and then allowed to fall, or the flush may be started with the pull-chain if the bell is counterpoised in the lifted position. In another shape the bell is provided with an additional concentrical flange, the well being built up upon the bottom of the tank.

MEETINGS.

THURSDAY, JULY 18—WEDNESDAY, JULY 24.

British Archæological Association.—Annual Congress to be held at Newcastle.

MONDAY, JULY 22, TO SATURDAY, JULY 27.

Architectural Association.—Annual excursion: headquarters at Cirencester.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 3.—By W. DREW & SON (at Denbigh).

Llanynys, &c., Denbigh.—The Cerrigllwydion Estate (portions of), area 384 a. 3 r. 33 p., f. (in numerous lots) £13,965

By WM. WESTON (at Paddington).

Paddington.—2, 4, 6, 14, 16, 18, and 29, Shirland-rd., u.t. 61 and 64 yrs., g.r. 66*l.*, r. 380*l.* (in lots) 3,680

Kilburn.—98, 100, 102, and 104, Cambridge-rd., f., r. 170*l.* 2,450

July 4.—By G. DURRANT & SONS (at Bungay).

Southelmham, St. Michael, Suffolk.—Two freehold and copyhold farms, 165 a. 3 r. 23 p. 1,570

July 5.—By WHITTINDALE & WATSON (at Coventry).

Walsgrave-on-Sowe, Warwick.—The Walsgrave Hall Estate, 380 a. 1 r. 27 p., f. 18,500

By MESSRS. COBB (at Sittinghourne).

Murston, Kent.—The Golden Ball b.h. and 3 r. 38 p., f. 3,500

Freehold orchard land, 5 a. 2 r. 37 p. 1,700

By BRUTON, KNOWLES, & Co. (at Gloucester).

Painswick, Glos.—The Steanbridge Estate, 432 a., f. (in lots) 8,740

By G. DURRANT & SONS (at East Dereham).

Stanfield, &c., Norfolk.—A freehold farm, 200 a. 0 r. 16 p. 2,225

July 6.—By M. DEROME & SON (at Kendal).

Patton, Westmorland.—Oldfield End Farm, 110 a. 3 r. 28 p., f. 4,000

Whitwell, &c., Westmorland.—Whitwell Folds, 67 a. 1 r. 27 p., f. 1,750

closures of common land, 11 a. 2 r. 36 p., f... 152

Whinfell, Westmorland.—Stone Hall Farm, 35 a. 2 r. 32 p., f. £1,420

Skelsmergh, Westmorland.—Laneside House and 15 a. 2 r. 12 p., f 1,110

Heights Allotment, 5 a. 0 r. 10 p., f 195

By BIDWELL & SONS (at Wisbech).

Elm, Cambs.—The Graysmoor Estate, 409 a. 2 r. 34 p., f. 11,700

By G. B. HILLIARD & SON (at Battlesbridge).

Rettendon, Essex.—Freehold cottage and 15 a. 0 r. 26 p. 400

Freehold tenement and 1 a. 2 r. 27 p. 150

High-rd., seven plots of freehold land 138

By PEIRCE & THORPE (at Northampton).

Weedon Beck, Northants.—A copyhold farm, 100 a. 1 r. 15 p. 1,825

Five enclosures of land, 57 a. 0 r. 32 p., c. 1,350

Newton's Close, 3 a. 0 r. 24 p., c. 155

Farmhouse and 0 a. 3 r. 31 p., c. 150

Enclosure of land, 15 a 3 r. 11 p., c. 700

July 8.—By FULLER, MOON, & FULLER.

Caterham, Surrey.—Stanstead-rd., a plot of land, f. 3·0

Stanstead-rd., a corner building site, 1 a. 0 r. 21 p., f. 340

Stanstead-rd., enclosure of building land, 10 a. 1 r. 37 p., f 1,460

By WM. HOUGHTON.

Walthamstow.—Havant-rd f.g.r. 30*l.*, reversion in 97 yrs. 740

133, 135, and 137, St. John's-rd., f. 870

42, Station-rd., with stabling premises, u.t. 94 yrs., g.r. 17*l.*, r. 89*l.* 14s. 450

Somers-rd., f.g.r. 6*l.*, reversion in 95½ yrs. 155

Leyton.—Leyton Marsh, freehold pasture land, 2 a. 2 r. 11 p. 120

By NORRIS & DUVALL.

Hertford.—The Balls Park Estate, 1,140 a. 3 r. 32 p., f. and c. 50,000

Part of Foxholes Farm, lands, gravel pits, &c., 77 a. 0 r. 4 p., f. 13,100

Part of Duckett's Farm, 50 a. 2 r. 6 p., f. 2,500

Great Broad Field, 8 a. 2 r. 4 p., f. 530

Little Amwell, Herts.—A freehold building estate, 27 a. 1 r. 30 p. 1,325

Hertford.—A freehold building estate, 19 a. 3 r. 22 p. 2,000

Freehold Lammas land, 28 a. 3 r. 20 p. 585

Ware, Herts.—Lady Mead enclosure, 6 a. 1 r. 19 p., f. 600

By MESSRS. RUTTER.

Kensington.—13A, Pembridge-pl., with three sets of artists' studios adjoining, f. 1,800

By ALFRED SAVILL & SON.

Sewardstone.—High-rd., the Grange and 20 a. or. 39 p., f. 2,400

High-rd., Chandler's Cottage and 6 a. 1 r. 28 p., f. 950

High-rd., Locks Hoppet, enclosure and two cottages, area 5 a 0 r. 29 p., f. 500

High-rd., North's Croft and Chapel Field, 11 a. 2 r. 17 p., f. 940

High-rd., Cob Mead, 40 a., f. 2,000

Avey-lane, Bandon's Enclosure, 11 a. 2 r. 13 p., f. 700

Avey-lane, the Chestnuts Cottage and 0 a. 0 r. 16 p., f. 250

By SIMMONS & SONS.

Wargrave, Berks.—London-rd., a building site, 1 a. 1 r. 10 p., f. 100

By CHARLES VARLEY.

Hornsey.—23, Hornsey Pk-rd., f., e.r. 38*l.*, subject to rent charge of 4*l.* 8s. 4d. 375

Harringay.—2, Colina-rd., u.t. 80 yrs., g.r. 6*l.*, r. 32*l.* 8s. 805

By G. A. WILKINSON & SON.

City of London.—One-third share of Nos. 91, Gresham-st., and 12, Staining-lane, u.t. 33 yrs., g.r. 95*l.*, r. 600*l.* 2,300

Surbiton, Surrey.—Surbiton-ter., f.g.r. 5*l.*, reversion in 936½ yrs. 130

Milton-Lilbourne, Wilts.—The Upper Farm, 65 a. 0 r. 22 p., f. (one-third share) 370

July 9.—By DEBENHAM, TEWSON, & Co.

Norwood.—Knight's Hill-rd., two corner plots of freehold building land 1,840

Casewick-rd., a plot of building land, f. 120

Thornlaw-rd., a plot of building land, f. 680

Uffington-rd., three plots of building land, f. .. 540

Uffington-rd., a corner building plot, f. 810

By DRIVERS (Holloway).

Holloway.—655 and 657, Holloway-rd., u.t. 77 yrs., g.r. 40*l.*, r. 80*l.* 910

Kentish Town.—100 and 102, Prince of Wales-rd., u.t. 39 yrs., g.r. 13*l.* 910

By HAMPTON & SONS.

Maida Vale.—37, Warrington-cres., u.t. 57 yrs., g.r. 26*l.*, e.r. 125*l.* 1,300

By NORRIS, SON, & HADLEY.

St. John's Wood.—3, Loudoun-rd., u.t. 19½ yrs., g.r. 40*l.*, e.r. 150*l.* 330

Sevenoaks, Kent.—11, Bayham-rd., u.t. 75 yrs., g.r. 38*l.* 2s. 6d., r. 80*l.* 500

By G. PEARCE & SONS.

Holloway.—3, Fairbridge-rd, u.t. 73½ yrs., g.r. 7*l.* 7s., e.r. 48*l.* 470

By ROGERS, CHAPMAN, & THOMAS.

Pimlico.—31, Tachbrook-st., u.t. 26½ yrs., g.r. 8*l.*, r. 70*l.* 790

By WILLIAM WESTON.

Bowes Pk.—35, 36, 37, and 41, St. Michael's-rd., u.t. 79 yrs., g.r. 24*l.*, r. 112*l.* 1,000

Bayswater.—56, Archer-st., u.t. 42½ yrs., g.r. 8*l.*, r. 52*l.* 425

Paddington.—19, Titchborne-st., u.t. 20 yrs., g.r. 7*l.*, r. 54*l.* 275

By HARDS & BRADLY.

Lewisham.—198, Ennersdale-rd., u.t. 65 yrs., g.r. 4*l.* 10s. 200

Catford.—35, 37, 41, 43, and 45, Holbeach-rd., f., r. 134*l.* 2,030

Silvermere-rd., f.g.r. 8*l.*, reversion in 87 yrs. 220

Greenwich.—South-st., f.g.r. 100*l.*, reversion in 78 yrs. 2,000

Muswell Hill.—1 and 2, Maud Villas and plot of building land adjoining 510

Greenwich.—13 and 15, Billingsgate-st., and plot of land in rear, f. 500

2, Clarence-st., u.t. 23 yrs., g.r. 9*l.*, r. 30*l.* 175

Peckham.—209 and 213, Hollydale-rd., u.t. 71 yrs., g.r. 9*l.* 6s. 8d. 470

Rotherhithe.—30, 30A, 31, and 32, Trinity-rd., and 1 to 9, Mariner's Buildings 1,000

Plumstead, Kent.—52, Whitworth-rd., f. £460

By WM. & JOHNSON & SON (at Manchester).

Chadderton, Lancs.—Scowcroft Hall Farm, 77 a. 2 r. 12 p., also f.g.r. 28*l.* 5s., reversion in 998 yrs. 3,850

By MESSRS. COBB (at Ashford).

Willesborough, Kent.—Aylesford house and 1 a. 2 r. 4 p., f. 400

A freehold cottage 125

Bentley Field, 10 a. 1 r. 3 p., f. 500

Southerton's, &c., enclosure, 5 a. 3 r. 38 p., f... 230

By CLOUGH & CO. (at Rhyl).

Rhyl, Flint.—River-st., Gorphwysfa, f. 1,500

By SADLER & BAKER (at Blackwater.)

Yateley, Hants.—Robin's Grove and 18 a. 2 r. 7 p., c. 3,500

Hedge Croft Close, 4 a. 2 r. 18 p., c. 500

By JAMES HAXELL (at Masons' Hall Taverr).

Brixton.—Canterbury-rd., the Canterbury Hotel, u.t. 65½ yrs., g.r. 92*l.* 10s., with goodwill 28,700

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

Norwood.—Gipsy-rd., the Paxton Hotel, u.t. 27 yrs., r. 110*l.*, with goodwill 5,130

July 10.—By BAXTER, PAYNE, & LEPPER.

Orpington, Kent.—Main-rd., enclosure of freehold building land, 3 a. 0 r. 9 p. 1,120

High-rd., enclosures of land, 37 a. 0 r. 1 p., f. .. 3,700

Chelsfield, Kent.—Lower Green Farm, 44 a. 1 r. 17 p., f. 3,000

Farnborough, Kent.—High-rd., two enclosures of meadow land, 9 a. 3 r. 21 p., f. 2,300

High-rd., &c., two enclosures of meadow land, 12 a. 1 r., 20 p., f. 2,24

Bromley, Kent.—South Hill, two blocks of building land, 3 a. 0 r. 18 p., f. 1,350

By DAVID J. CHATTELL.

Chislehurst, Kent.—Bromley-lane, a freehold building site, 1 a. 1 r. 3 p. 1,000

By CURTIS & HENSON.

Edmonton.—105, Fore-st., f., r. 35*l.* 755

By GUY EWING & Co.

Leicester-sq.—Nos. 39, 40, 41, and 42, area 2,978 ft., part f. and part u.t. 74 yrs., g.r. 35*l.* 23,000

By GENDLE & SON.

Streatham.—2 and 4, Northanger-rd., u.t. 78 yrs., g.r. 20*l.*, r. 90*l.* 800

By HUMBERT & FLINT.

Rayne, Essex.—Broadfields Farm, 127 a. 0 r. 9 p., f. 1,350

Stebbing, Essex.—Porter's Hall Farm, 230 a. 0 r. 7 p., f. 1,350

Stebbing Green, &c., five enclosures of land, 29 a. 0 r. 22 p., f. 445

Church Farm, 187 a. 1 r. 35 p., f. 1,610

Stebbing Park Estate, 318 a. 0 r. 21 p., f. 3,450

The Mill House, and 5 a. 3 r. 27 p., f. 600

Bran End, five enclosures of land, 29 a. 1 r. 2 p., f. 460

White Hart Farm, 204 a. 2 r. 2 p., f. 1,550

The Allotments Field, 9 a. 0 r. 10 p., f. 130

By MARK LIELL & SONS.

Stratford.—Sugar House-lane, manufacturing premises, area 1 acre, u.t. 35 yrs., g.r. 110*l.*, e.r. 379*l.* 1,400

Forest Gate.—70, Windsor-rd., u.t. 75 yrs., g.r. 9*l.* 16s., e.r. 55*l.* 600

By RUSHWORTH & STEVENS.

Tottenham Court-rd.—61, Goodge-st., u.t. 80 yrs., g.r. 10*l.* until Lady Day, 1904, and 35*l.* for residue of term, r. 260*l.* 3,470

Pinner, Middlesex.—Woodridings, Elmleigh and Homeleigh, f., r. 95*l.* 1,400

By DOUGLAS YOUNG & Co.

Ilford, Essex.—High-rd., Clement's Wood Recreation Ground, area 2 a. 0 r. 19 p., f. 2,500

Dulwich.—Friern-rd., f.g.r.'s 48*l.*, reversion in 75 yrs. 1,300

Stockwell.—118, Landor-rd., with laundry and stabling, u.t. 73 yrs., g.r. 8*l.*, r. 60*l.* 700

Leyton.—Oakdale rd., i.g.r.'s 54*l.*, u.t. 86 yrs., g.r. 35*l.* 8s. 335

By FULLER, MOON, & FULLER (at Croydon).

Thornton Heath.—The Drive, f.g.r. 21*l.*, reversion in 88 yrs. 485

44 to 47, Gillett-rd., f., r. 78*l.* 865

52 to 70 (even), Zion-rd., f. 1,825

Croydon.—30 and 36, Whitehorse-lane, f., r. 65*l.* .. 910

Whitehorse-lane, The Granaries, f., r. 120*l.* 1,660

135, Clifton-rd., f., r. 28*l.* 450

71, Farnley-rd., f., r. 40*l.* 600

52 and 54, Farnley-rd., f. 705

68 to 74 (even), Farnley-rd., f. 1,010

Farnley-rd., freehold building land, with stabling premises, &c. 575

129 to 133, Bensham-lane, also a plot of building land, f. 1,450

Queen's-rd., f.g.r.'s 35*l.*, reversion in 35 yrs. 700

157 to 167 (odd), Queen's-rd., f. 1,200

Albert-rd., &c., f.g.r. 75*l.*, reversion in 70 yrs... 1,510

Thornton-rd., freehold store and yard 400

Marden Villas, f.g.r. 75*l.*, reversion in 95 yrs. .. 1,255

By MESSRS. KEMSLEY (at Romford).

Orsett, Essex.—Fordham's-row, 15 cottages, f. .. 720

By CLOUGH & CO. (at Denbigh)

Ysceifiog, Flint.—Coedmynydd and Cae Glas Farms, 162 a. 0 r. 27 p., f. 2,800

Cae Glas Ucha Farm, 43 a. 3 r. 19 p., f. 520

July 11.—By S. BRADFORD.

Haymarket.—Challis' Royal Hotel, comprising 7, 8, and 9, Coventry-st., f., and 59 to 64, Rupert-st., u.t. 67 yrs., g.r. 480*l.*, r. 1,026*l.*, total area 6,597 ft., including goodwill and mortgage .. 51,000

By FAREBROTHER, ELLIS, & Co.

Highbury.—7 and 9, Highbury Grange and 56, Highbury Pk., also f.g.r.'s 62*l.*, and Peppercorn ground rents, reversions in 17 and 18 yrs., and a building site in Kelross-rd., area 18,600 ft., f... 10,500

By A. & A. FIELD.

Peckham.—68, Gibbon-rd., u.t. 56 yrs., g.r. 5*l.*, r. 30*l.* 230

Sydenham.—4, St. Mark's-rd., u.t. 46 yrs., g.r. 3*l.* 10s. 130

Thornton Heath.—58, Grange Pk., u.t. 76½ yrs., g.r. 4*l.* 10s. 140

Twickenham.—1, Amyand-ter., u.t. 62 yrs., g.r. 5*l.*, r. 23*l.* 250

Hanwell.—29 and 31, St. Dunstan's-rd., f. 445

Mile End.—18, King Edward-st., f. 440

Hackney.—160, Amhurst-rd., u.t. 65 yrs., g.r. 8*l.*, r. 48*l.* 600

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By C. C. & T. MOORE.

Buckhurst Hill. — Westbury-rd., Westbury and land adjoining, area 25,000 ft., f. £1,400
Rotherhithe.—51, 53, and 55, St. Marychurch-st., area 3,450 ft., f. 600
Forest Gate.—58, Hamfrith-rd. and land adjoining, f., e.r. 45*l.* 820
Mile End.—247, 249, and 251, Mile End-rd, f., r. 148*l.* 3,205
Leytonstone.—4, Forest Drive East, f., e.r. 50*l.*.. 480
Woodhouse-rd., Niell House, f. 270
Mile End.—27 to 37 (odd), Wellesley-st., u.t. 23 yrs., g.r. 18*l.* 880

NEWBON, EDWARDS, & SHEPHARD.

Stoke Newington.—24, Defoe-rd., u.t. 63½ yrs., g.r. 6*l.*, r. 30*l.* 300
Canonbury.—2, Marquess-rd., u.t. 44 yrs., g.r. 10*l.*, r. 60*l.* 455
Islington.—39, College-st., u.t. 14¾ yrs., g.r. 7*l.*, r. 34*l.* 150
Kentish Town.—6, Raglan-st., u.t. 23 yrs., g.r. 4*l.* 200
Manor Park.—41, 45, 47, and 49, Meanley-rd., u.t. 71 yrs., g.r. 5*l.* 725

ROGERS BROS.

Peckham.—147, Peckham Rye, u.t. 13½ yrs., g.r. 10*l.* 150
Claremont pl., &c., i.g.r. 56*l.*, u.t. 14 yrs., g.r. 20*l.* 185
Dulwich.—22, Gowlett-rd., u.t. 67 yrs., g.r. 7*l.*, r. 34*l.* 325

By STIMSON & SONS.

Old Kent-rd.—Canterbury-rd., f.g.r. 22*l.* 10s., reversion in 65 yrs. 565
Hatcham-rd., f.g.r. 28*l.*, reversion in 49 yrs.... 625
Hatcham-rd., f.g.r. 15*l.* 15s., reversion in 44½ yrs. 385
Penarth-st., f.g.r. 28*l.*, reversion in 49 yrs..... 660
Marlborough-rd., f.g.r. 20*l.*, reversion in 39 yrs. 560
Talfourd-rd., f.g.r.'s 62*l.* 10s., reversion in 60 yrs. 1,660
Camberwell.—44, Allendale-rd., u.t. 60½ yrs., g.r. 5*l.* 5s., r. 32*l.* 360
Abbey Wood, Kent.—Harrow Manor Way, &c., a block of freehold land, 9 a. 0 r. 20 p., f. 1,070
Camberwell.—5, Camberwell-rd., u.t. 48 yrs., g.r. 48*l.* r. 147*l.* 1,640
Kennington.—14 and 16, Opal-st., held subject to lives aged 73, 82 and 79, g.r. 2*l.*, with policy for 350*l.* 300
Peckham.—32, Hanover-pk., u.t. 70 yrs., g.r. 8*l.* r. 40*l.* 450
Walworth.—9, 11, and 13, Alvey-st., with stabling, &c. in rear, f., r. 105*l.* 1,650
9, 11 and 11a, Blackwood-st., u.t. 80 yrs., g.r. 18*l.* 600
44a, 44b, 48, 50 and 52, Brandon-st., u.t. 57 yrs., g.r. 38*l.*, r. 110*l.* 1,000
Dulwich.—47, Thurlow Park-rd., u.t. 76 yrs., g.r. 8*l.* 10s., r. 42*l.* 370
Stroud Green.—52 and 54, Ferme Park-rd., u.t. 77 yrs., g.r. 20*l.*, r. 111*l.* 1,110

By WILLATS & Co.

Bloomsbury.—48, High-st., f., e.r. 120*l.*..... 2,410

By S. & G. KINGSTON (at Holbeach).

Gedney, Lincs.—Red House Farm, 471 a. 2 r. 25 p., f. 21,000
A freehold farm, 424 a. 2 r. 21 p. 8,150
Six cottages and 1 a. 2 r. 19 p., f. 425
Holbeach, Lincs.—A freehold farm, 398 a. 1 r. 14 p. 12,000

July 12.—By C. W. DAVIES & SON.

Clapton.—54 to 68 (even), Trout-rd., u.t. 66 yrs., g.r. 32*l.* 1,700
Holloway.—89 and 91, Queensland-rd., u.t. 58 yrs., g.r. 7*l.* 10s. 365
74, 76, and 78, Hampden-rd., u.t. 69 yrs., g.r. 18*l.* 675
Islington.—493, Liverpool-rd., f., e.r. 4*l.*..... 500
Stoke Newington.—57 to 65 (odd), Matthias-rd., f. 965
Dalston.—76 and 78, Queen's-rd., u.t. 23¾ yrs., g.r. 12*l.* 10s., r. 80*l.* 610
Hoxton.—153, St. John's-rd., u.t. 37 yrs., g.r. 19*l.* 260
Finsbury Pk.—2, Moray-mews, f., e.r. 70*l.* 680

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s	d		
Hard Stocks	1	14	0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1	11	0	"	" "
Facing Stocks	2	12	0	"	" "
Shippers	2	8	0	"	" "
Flettons	1	8	6	"	at railway depot
Red Wire Cuts	1	14	6	"	" "
Best Fareham Red	3	11	0	"	" "
Best Red pressed Ruabon Facing.	5	5	0	"	" "
Best Blue Pressed Staffordshire	4	4	6	"	" "
Do., Bullnose	4	9	0	"	" "
Best Stourbridge Fire Bricks	4	2	6	"	" "
GLAZED BRICKS.					
Best White and Ivory Glazed Stretchers	13	0	0	"	" "
Headers	12	0	0	"	" "
Quoins, Bullnose, and Flats	17	0	0	"	" "
Double Stretchers	19	0	0	"	" "
Double Headers	16	0	0	"	" "
One Side and two Ends	19	0	0	"	" "

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.		
Two Sides and one End	20	0	0	per 1,000 at railway depôt	
Splays, Chamfered, Squints	20	0	0	"	" "
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	"	" "
Quoins, Bullnose, and Flats	14	0	0	"	" "
Double Stretchers	15	0	0	"	" "
Double Headers	14	0	0	"	" "
One Side and two Ends	15	0	0	"	" "
Two Sides and one End	15	0	0	"	" "
plays, Chamfered, Squints	14	0	0	"	" "
Seconds Quality White and Dipped Salt Glazed	2	0	0	"	less than best.

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	" "
Best Portland Cement	35	0	per ton, delivered.
Best Ground Blue Lias Lime	25	6	" "

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered
Stourbridge Fire-clay in sacks	18s.	0 l. per ton at rly. dpt

STONE.

	£	s.	d		
Ancaster in blocks	2	0	per ft. cube, deld	ly dep't.	
Bath "	1	7	"	"	
Farleigh Down Bath	1	8	"	"	
Beer in blocks	1	6½	"	"	
Grinshill "	1	10	"	"	
Brown Portland in blocks	2	2	"	"	
Darley Dale in blocks	2	1½	"	"	
Red Corsehill "	2	5	"	"	
Red Mansfield "	2	4½	"	"	
Hard York in blocks	2	10	"	"	

Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2	8	per ft. super. at rly. depôt
" " 6 in. Rubbed Ditto	3	0	" "
" " 3 in. sawn both sides slabs (random sizes)	1	3	" "
" 3 in. self-faced Ditto	0	9½	" "
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld. rly. depôt.
" " " 6-in sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
" " " 3-in. do.	1	2½	" "

SLATES.

in.	in.	£	s.	d.	
20 × 10 best blue Bangor		11	5	0	per 1000 of 12 to at ry. dep.
" best seconds	"	10	15	0	" "
16 × 8 best	"	6	9	6	" "
20 × 10 best blue Portmadoc		10	18	0	" "
16 × 8 best blue Portmadoc		6	0	0	" "
20 × 10 best Eureka unfading green		11	9	6	" "
16 × 8 " "		6	15	0	" "
20 × 10 Permanent green		10	0	0	" "
16 × 8 " "		5	18	6	" "

TILES.

	£	s.	d.	
Best plain red roofing tiles	4	12	6	per 1,000 at rly. depôt.
Hip and valley tiles	3	7	per doz.	" "
Best Broseley tiles	4	8	6	per 1,000 " "
Hip and valley tiles	4	0	per doz.	" "
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000	" "
Do. ornamental Do.	60	0	"	" "
Hip tiles	4	0	per doz.	" "
Valley tiles	3	9	"	" "
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000	" "
Hip tiles	4	1	per doz.	" "
Valley tiles	3	8	"	" "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £	s	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14	10	0	16	10	0
Deals: best 3 by 9	13	10	0	14	10	0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals seconds	1	0	0	less than best		
Battens: seconds	0	10	0	" "	"	
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	10	10	0
2 in. by 4½ in. and 2 in. by 5 in.	9	0	0	10	0	0
Foreign Sawn Boards—						
1 in. by 12 in. by 12 in.	0	10	0	more than battens.		
¾ in.	1	0	0	more than battens.		
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	18	6	3	15	0
Swedish balks	2	15	0	3	0	0
Pitch pine timber (35 ft. average)	3	0	0	3	10	0

JOINERS' WOOD.

	At per standard.					
White Sea: First yellow deals, 3 in. by 11 in.	25	0	0	26	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	19	0	0	20	0	0
Second yellow deals, 3 in. by 11 in.	20	0	0	21	0	0
" " 3 in. by 9 in.	19	0	0	20	0	0
Battens, 2½ in. and 3 in. by 7 in.	15	0	0	16	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	0	0	16	0	0
Battens, 2½ in. and 3 in. by 7 in.	12	0	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	22	0	0	23	0	0
Do. 3 in. by 9 in.	19	0	0	20	0	0
Battens	14	10	0	15	10	0
Second yellow deals, 3 in. by 11 in.	16	10	0	17	10	0
Do. 3 in. by 9 in.	15	0	0	16	0	0
Battens	12	0	0	12	10	0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Third yellow deals, 3 in. by 11 in.	13	10	0	14	10	0
Do. 3 in. by 9 in.	13	0	0	13	10	0
Battens	11	10	0	12	0	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	15	0	0	16	0	0
" " 3 in. by 9 in.	14	0	0	15	0	0
Battens	12	0	0	13	0	0
Second white deals 3 in. by 11 in.	14	0	0	15	0	0
" " " 3 in. by 9 in.	13	0	0	14	0	0
" " battens	10	10	0	11	10	0
Pitch pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—						
First, regular sizes	30	0	0	33	0	0
Broads (12 in. and up)	2	0	0	more.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—						
Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	2	6	0	3	0
Small " "	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	7
in. do. do.	0	0	7	-	-	-
Dry Mahogany—						
Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	16	0	0	20	0	0
American Whitewood Planks—						
Per ft. cube	0	3	0	0	3	6
Prepared Flooring—	Per square					
1 in. by 6 in. and 7 in. yellow, planed and shot	0	13	0	0	16	6
1 in. by 6 in. and 7 in. yellow, planed and matched	0	13	6	0	17	6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0	16	0	1	1	0
1 in. by 6 in. and 7 in. white, planed and shot	0	11	0	0	13	0
1 in. by 6 in. and 7 in. white, planed and matched	0	11	6	0	13	6
1¼ in. by 6 in. and 7 in. white, planed and matched	0	14	0	0	16	6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	7	0	0	8	0	0
Compound Girders " "	9	0	0	10	5	0
Angles, Tees and Channels, ordinary sections	8	17	6	10	17	6
Flitch Plates	9	0	0	9	15	0
Cast Iron Columns and Stanchions, including ordinary patterns	7	5	0	9	0	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON.—						
Common Bars	8	0	0	8	10	0
Staffordshire Crown Bars, good merchant quality	8	10	0	9	0	0
Staffordshire "Marked Bars"	10	10	0	-	-	-
Mild Steel Bars	9	0	0	9	10	0
Hoop Iron, basis price	9	5	0	9	15	0
" " galvanised	16	0	0	-	-	-
(* And upwards, according to size and gauge.)						
Sheet Iron, Black.—						
Ordinary sizes to 20 g.	10	0	0	-	-	-
" " to 24 g.	11	0	0	-	-	-
" " to 26 g.	12	10	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality.—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12	10	0	-	-	-
" " 22 g. and 24 g.	13	0	0	-	-	-
" " 26 g.	14	0	0	-	-	-
Sheet Iron, galvanised, flat, best quality.—						
Ordinary sizes to 20 g.	16	10	0	-	-	-
" " 22 g. and 24 g.	17	0	0	-	-	-
" " 26 g.	18	10	0	-	-	-
Galvanised Corrugated Sheets.—						
Ordinary sizes, 6 ft. to 8 ft. to 20 g.	12	10	0	-	-	-
" " 22 g. and 24 g.	13	0	0	-	-	-
" " 26 g.	14	0	0	-	-	-
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	5	0	-	-	-
" " 22 g. and 24 g.	13	5	0	-	-	-
" " 26 g.	14	5	0	-	-	-
Cut nails, 3 in. to 6 in.	9	10	0	10	0	0
(Under 3 in. usual trade extras.)						

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	15	5	0	-	-	-
Pipe in coils	15	15	0	-	-	-
Soil Pipe..	18	5	0	-	-	-
ZINC—Sheet—						
Vieille Montagne ton	24	0	0	-	-	-
Silesian	23	10	0	-	-	-
COPPER—						
Strong Sheet per lb.	0	1	0½	-	-	-
Thin "	0	1	2	-	-	-
Copper nails "	0	1	2	-	-	-
BRASS—						
Strong Sheet "	0	0	11	-	-	-
Thin "	0	1	1	-	-	-
TIN—English Ingots "	0	1	5	-	-	-
SOLDER—Plumbers' "	0	0	7	-	-	-
Tinmen's "	0	0	8	-	-	-
Blowpipe "	0	0	9	-	-	-

PLASTER, &c.

	s.	d.	
Coarse Plaster	30	0	per ton delivered.
Fine "	38	0	" "
Coarse Keenes and Parian cement	51	6	" "

[See also next page.

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Sanitary Fittings, Alteration to Doors, Cleaning, &c.	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	July 22
Store House, Office, &c., Didcot	Great Western Railway Company	G. K. Mills, Paddington Station, W.	July 23
Additions, &c., to Station, Pembroke Dock.....	do.	do.	do.
Station Extension (No. 2), Manchester	L. & Y. Railway Company.....	R. C. Irwin, Hunt's Bank, Manchester	do.
Goods Yard, &c., Wapping, Liverpool	do.	do	do.
Flints and Granite Macadam.....	Southampton Corporation.....	W. B. G. Bennett, Engineer, Municipal Offices, Southampton ..	do.
Sewering, Forming, &c., Henry-street and others	Crewe Town Council	G. Eaton-Shore, Surveyor, Earl-street, Crewe	do.
Granite Paving, South-street	do.	do.	do.
Pipe Sewers, &c.	Llantrisant R.D.C.	G. S. Morgan, Surveyor, School-street, Pontyclun	do.
Brick Culvert, &c., Gibshill	Greenock Police Board	C. MacCulloch, Town Hall, Greenock	do.
Alteration of Business Premises, Pitt Hill, Durham...	Beamish & West Pelton Club, Ltd	M. N. Foster, Architect, Stanley, R.S.O.	do.
Offices, Showroom, &c., Cook-lane	Keighley Corporation	Engineer, Gas Offices, Low Bridge, Keighley	do.
Street Works, Middleton-street	Amble U.D.C.....	W. Gibson, Surveyor, Council Offices, Amble	do.
Shelters, Queen-street, &c.	Cardiff Corporation	W. Harpur, Civil Engineer, Town Hall, Cardiff.....	do.
Cottage, Edmondstown, Ireland	Ardee R.D.C.	L. Tourley, Civil Engineer, 17, Laurence-street, Drogheda ...	do.
Lodge, &c., Ruchill Park	Glasgow Corporation	A. B. Macdonald, Civil Engineer, City Chambers, Glasgow	July 24
Church Works, Gortin, Ireland	Rev. F. Healy.....	E. J. Toye, Architect, Strand, Londonderry	do.
Stables, Sheds, &c., Hull	North-Eastern Railway Company	W. Bell, Architect, York	do.
Sewerage Works, Pakefield, Lowestoft	Mutford, &c., R.D.C.	F. Peskett, 148, London-road, Lowestoft	do.
Sewerage Works, Pulteneytown, N.B.	.....	Jas. Fraser, Civil Engineer, Inverness	do.
Grit Setts (1,000 tons)	Denton (Lancs) U.D.C.	G. H. Newton, Surveyor, Town Hall, Denton	do.
Asphalting, Pontefract-road	Castleford U.D.C.	W. Green, Surveyor, Council Offices, Castleford	do.
Two Houses, Bective-road, Kirby Lonsdale	Mr. J. Dean	J. Hutton, Architect, Kendal	do.
Cleaning and Painting Various Stations, South	Midland Railway	Company's Architect, Cavendish House, Derby.....	July 25
Making-up and Paving Road	Hackney Borough Council	Borough Engineer, Town Hall	do.
House, New-road, Llanelly	Mr. R. W. Evans	T. Arnold, Castle Buildings, Llanelly	do.
Road, Dorket Head, Arnold	Nottingham Corporation	S. Moore, St. Peter's Church Side, Nottingham	do.
School, Geneva-place	Bideford School Board	R. T. Hookway & Son, Architects, 12, Bridgeland-st., Bideford...	do.
Additions, &c., to Rock House, Bideford	Mr. A. J. Lawman	do.	do.
Vicarage, near Neath	.....	G. E. Halliday, Architect, 14, High-street, Cardiff	do.
*Brass Hand Rails to Staircase, Ladywell Workhouse	St. Olives Guardians	Newman & Newman, Architects, 31, Tooley-street, S.E.	do.
Fire Appliances, Ladywell Workhouse	do.	do.	do.
Additions to Infirmary, Salisbury.....	.....	J. Harding & Son, Architects, 58, High-street, Salisbury	July 26
*Mortuary at Leavesden Asylum.....	Metropolitan Asylums Board	Surveyor to Board, Embankment, E.C.....	July 27
*Cooking Appliances, Darenth Asylum	do.	do.	do.
Police Court, Ton, Rhondda Valley, Glam	.....	Griffiths & Jones, Architects, Tonypandy.....	do.
House, Drumlithie, Aberdeen	Glenbervie School Board	G. Gregory, Architect, Stonehaven	do.
Sanitary Conveniences, Kimberley Park	Falmouth Corporation	J. H. Genn, Municipal Buildings, Falmouth	do.
Gymnasium Floor, Bath-lane.....	Leicester Corporation...	G. E. Mawbey, Civil Engineer, Town Hall, Leicester	do.
Additions to School near St. Albans	Sandridge School Board.....	H. E. Hansell, Architect, Station Buildings, St. Albans	do.
Library Fittings for Branch Library	Hornsey U.D.C.	Surveyor to Council, Southwood-lane, Highgate	July 29
Additions to Police Station, Lowestoft	East Suffolk County Council.....	H. Miller, Civil Engineer, 16, Museum-street, Ipswich	do.
Service Reservoir, Perth Gelyn	Mountain Ash (Glam) U.D.C.	J. Mansergh, Engineer, 5, Victoria-street, S.W.	do.
Farmhouse, Stabling, &c., near Abergavenny	.....	B. J. Francis, Architect, Abergavenny	do.
Additions to Electricity Works	Bury (Lancs) Corporation	A. W. Bradley, Civil Engineer, Town Hall, Bury	July 30
Erection of Kursaal, Ironwork	Hunsgate Corporation	Robt. J. Beale, A.R.I.B.A., 3, The Broadway, Westminster	Aug. 1
Hospital, House, &c.	Chailey (Sussex) R.D.C.	H. Card, Civil Engineer, 10, North-street, Lewes	do.
Additions to Asylum, Parkside, Macclesfield	.....	H. Beswick, County Architect, Newgate-street, Chester	do.
*Sewers	Stroud R.D.C.....	Council Offices, John-street, Stroud	do.
Electric Tram Car Sheds	Sunderland Corporation.....	Barnes & Coates, 41, Fawcett-street, Sunderland.....	Aug. 2
*Offices, &c.....	Birkenhead Union	See Advertisement	Aug. 3
Schools, Ely, near Cardiff	Llandaff School Board	E. Down, Architect, 31, High-street, Cardiff	Aug. 7
Sewerage Works, Pole Elm, &c.	Upton-on-Severn R.D.C.	E. B. Marten, Civil Engineer, Stourbridge	Aug. 8
*New Infirmary Building	King's Lynn Union	Chas. Smith & Son, Merchants, Reading	do.
Sewerage Works, near Barnsley.....	Darfield U.D.C.	Fairbank & Son, Civil Engineers, 13, Lendal, York	Aug. 12
Outfall Sewer	Aberdeen Town Council	Burgh Surveyor, Town House, Aberdeen	Aug. 13
Service Reservoir	Ipswich Corporation	H. Roberts Engineer, Town Hall, Ipswich	Aug. 15
*Alterations and Additions to Workhouse.....	Fulham Guardians	A. Saxon Snell, Architect, 22, Southampton-buildings, W.C.	do.
House, Stable, &c., Pontlottyn	.....	J. S. Galliford, Pontlottyn, Wales	No date
Additions to Schools, Rugby	.....	E. H. L. Barker, Architect, 146, St. Owen-street, Hereford	do.
Stables, Woolpack Inn, Salisbury	Messrs. Gibbs, Mew, & Co.....	J. Harding & Son, Architects, 58, High-street, Salisbury	do.
House, Stabling, &c., Northallerton	.....	J. Walker, North Arch House, Northallerton	do.
Additions to School, Percy-street	Nottingham School Board.....	A. N. Bromley, Architect, Queen-street, Nottingham	do.
Warehouse, Meanwood, Leeds	.....	M. Walker, 1, Sandhurst-terrace, Horsforth, Leeds	do.
Limestone (4,000 tons)	.....	G. Livingstone, 17, Victoria-street, S.W.	do.
Buildings, Chimney, &c., Whaley Bridge	.....	C. E. Bennett & Co., Birch Vale Works, Whaley Bridge	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Littlehampton U.D.C.....	3*l.* 3*s.* per week	July 22
*Architectural Assistant	Woolwich Council.....	3*l.* 10*s.* per week	July 30
*Assistant in Drainage Department	do.	2*l.* 10*s.* per week	do.
*Surveyor's Assistant	do.	2*l.* 10*s.* per week	do.
*Clerk of Works	Newport (Salop) U.D.C.	.....	No date
*Surveyor	Southall Norwood U.D.C.	275*l.* per annum	do.
*Temporary Assistant, Borough Surveyor's Office	....	.....	do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vi. viii. x. & xxiii. Public Appointments, pp. xxi. & xxiii.

PRICES CURRENT (*Continued*).

PLASTER, &c.

	s.	d.	
Fine Keenes and Parian cement	59	6	per ton delivered.
Robinson's Fireproof Cement..	51	6	,, ,,
Do. Finishing ,, ..	56	6	,, ,,
(Exclusive of the ordinary charge for sacks.)			
Whiting.....	30	0	,, ,,

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
,, ,, fourths	2½d.	,, ,,
21 oz. thirds	3½d.	,, ,,
,, ,, fourths.....	3¾d.	,, ,,
26 oz. thirds	5d.	,, ,,
,, ,, fourths	4½d.	,, ,,
32 oz. thirds	6d.	,, ,,
,, ,, fourths	5½d.	,, ,,

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

Fluted sheet, 15 oz.	3½d	per ft. delivered.
,, ,, 21 ,, ...	4½d.	,, ,,
½ ,, Hartley's Rolled Plate.....	3d.	,, ,,
⅝ ,, ,, ,, ...	3¾d.	,, ,,
½ ,, ,, ...	4d.	,, ,,

OILS, &c.

		£	s	d.
Raw Linseed Oil in pipes.....per gallon		0	2	10
,, ,, ,, in barrels	,,	0	2	11
,, ,, ,, in drums	,,	0	3	1
Boiled ,, ,, in pipes.....	,,	0	3	0
,, ,, ,, in barrels	,,	0	3	1
,, ,, ,, in drums	,,	0	3	3
Turpentine, in barrels	,,	0	2	4
,, in drums.....	,,	0	2	6
Genuine Ground English White Lead ...per ton		23	0	0
Red Lead, Dry.....	,,	24	0	0
Best Linseed Oil Putty.....per cwt.		0	9	0
Stockholm Tar ..... per barrel		1	10	0

PRICES CURRENT (*Continued*).

VARNISHES, &c.

	per gallon £	s.	d.
Fine Elastic Copal Varnish for outside work ..	0	16	6
Best Elastic Copal Varnish for outside work ..	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	6
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work....	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	0
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	9	0
Berlin Black	0	15	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

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TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

AYLESBURY.—For the erection of a residence, Rickford's Hill, for Mr. W. Crouch. Mr. Fred. Taylor, architect. Quantities by the architect:—

Honour & Son	£2,700	Webster & Cannon	£2,458
Cook & Son	2,575	Green & Co.*	2,354
G. H. Gibson	2,541		

AYLESBURY.—For the erection of a pair of villas in Manor Park, for Mr. Chimes. Mr. Fred. Taylor, architect:—

J. Holland	£928	Webster & Cannon	£720
Mayne & Son	780	Green & Co.*	705

BRECHIN (N.B.).—For the erection of school buildings, Edzell, for the Edzell School Board. Mr. D. Wishart Galloway, architect, 2, Market-street, Brechin:—

Masonry.—David A. Crabb, Brechin....
Joinery.—Bruce & Son, Clepington-road, Dundee.....
Plumbing.—J. A. M. Fox, Edzell..... } £2,000
Plastering.—Chas. Thomson, Brechin..
Slating.—James Scott, Brechin.....

CHRISTCHURCH (Hants).—For additions to the workhouse (viz., a new boardroom and home for the nurses), for the Guardians of Christchurch Union, Hants. Mr. E. H. Burton, architect, Christchurch:—

Thos. Tiller	£4,340	S. Whittaker, Boscombe, Bournemouth*	£3,974
Miller & Sons	4,308		
Jenkins & Sons	4,260		

DERBY.—For Primitive Methodist church at Dale-road, Derby. Mr. F. S. Antliff, architect, Draycott. Quantities by architect:—

J. Young	£2,575 0 0	G. Wagg	£1,867 14 0
J. W. Chapman	2,340 0 0	W. Edwards*	1,737 4 6
A. Brown	2,315 0 0		

[All of Derby.]

DRAYCOTT.—For isolation hospital at Draycott, near Derby. Mr. F. S. Antliff, architect. Quantities by architect:—

A. Brown	£8,508 0 0	Youngman & Son	£7,817 0 0
Perks & Son	8,025 0 0	Warner Bros., Mickleover, near Derby*	7,707 4 0
A. B. Clarke	7,850 0 0		
G. Wagg	7,839 17 6		

EASTBOURNE.—For alterations and additions to De Waldern Court, Mears-road, Eastbourne, for Mr. Ralph Burdett, of North Cheam House, Surrey. Mr. Cecil A. Sharp, architect, 11, Old Queen-street, Queen Anne's-gate, S.W.:—

Cornwell & Son*..... £550

Electric Light Alterations.

Pearson, Ltd. £78

ELGIN.—For the erection of a residence in Forteath-avenue, Elgin. Mr. R. B. Pratt, architect, Town and County Bank Buildings, Elgin:—

Davidson & Hay, Elgin.....
Carpentering.—McKay, Dufftown .....
Plastering.—Brodie, Elgin ..... } £900
Painting.—Fordyce, Elgin .....
Slating.—Wilson, Dufftown .....

HAMPTON.—For the re-erection of the Windmill beer-house, Hampton, for Messrs. Charrington & Co. Mr. Edward Monson, architect, Acton Vale, W., and 22, Buckingham-street, Adelphi, W.C.:—

Godson & Sons	£2,200	J. J. Collings	£1,841
Lascelles & Co.	2,059	W. Blackburn, Chiswick, W.*	1,798
Antil & Co.	2,000		
J. Christie	1,978		

HARROGATE.—For the erection of a kursaal for the Corporation. Mr. Robt. J. Beale, architect, Broadway House, Westminster. Quantities supplied:—

Excavating, Bricklaying, and Masonry.

Raworth & Allen	£16,673	Graham & Sons, Huddersfield*	£14,313
H. Abbot	16,300		
Nicholson & Sons	15,486		

Carpentry and Joinery.

F. Pattinson	£7,529	J. W. Rudd	£6,139
T. Linskill	7,300	Raworth & Allen, Harrogate*	5,623
Nicholson & Sons	6,577	W. Isherwood (withdrawn)	5,188
Jas Taylor	6,490		

Slating.

Raworth & Allen	£485 0	T. Rayner	£472 1
J. W. Baynes	482 0	William Atkinson, Leeds*	369 18
J. Shepherd	475 0		

Plastering.

Johnson & Sons	£1,597 11 2	Raworth & Allen	£1,430 0 0
A. & S. Wheater	1,456 0 0	Fortune & Calverley, Harrogate*	1,410 0 0

Plumbing and Glazing.

Higginbotham & Sons	£2,200	Raworth & Allen	£2,040
J. H. Shouksmith	2,100	G. Thompson	2,000
H. Braithwaite	2,078	T. Armitage	1,995
J. Lindley	2,045	C. Foster, Harrogate*	1,971
		H. Lindley	1,885

Painting.

Jessop & Cosgrove	£415	D. E. Hutton	£359
Raworth & Allen	395	Higginbotham & Sons	350
Sparrow & Son	394	Noddings & Sons, Harrogate*	280
Broadbank & Sons	380		
R. Petty	360		

All Trades.

Geo. Warren	£32,959	Raworth & Allen	£26,522

LEIGHTON BUZZARD.—For the erection of a cottage at Southcote, for Mr. Leopold de Rothschild. Mr. Fred. Taylor, architect, Aylesbury:—

Garside & Sons	£672	G. Heley*	£665

LONDON.—For alterations to the second floor of No. 109, Fleet-street, for Messrs. Thos. Cook & Son. Messrs. Smee, Mence, & Houchin, architects, 12, West Smithfield, E.C.:—

Barrie Bros.	£338	J. V. Kiddle & Son*	£305
T. Nixon	333		

LONDON.—For two blocks of maisonettes, Bolingbroke-grove, Wandsworth. Mr. Herbert Bignold, architect, Lavender Hill, S.W.:—

R. Ward* £2,060

LONDON.—For the erection of shops and flats to be known as Uxbridge Mansions, Nos. 156 and 158, Uxbridge-road, W., for Mr. Chas. Tarrant. Mr. Alfred H. Hart, architect, 9, Staple Inn, Holborn, W.C.:—

Lyford	£4,333	Subey & Sons	£4,041
Williams	4,291	Chessum	3,952
Hastings & Ladley	4,160	Weibking & Sons*	3,549

LONDON.—For rebuilding premises in Tottenham Court-road. Mr. Alfred Conder, architect, Palace Chambers, Westminster. Quantities by Mr. E. J. Paine, 11, Great James-street, W.C.:—

Steed & Son	£3,997	B. E. Nightingale	£3,559
Grover & Son	3,965	Stimpson & Co.	3,550
McCormick & Sons	3,828	Akers & Co.	3,408
R. H. & R. Roberts	3,659	H. Young*	3,168
E. Toms	3,597		

MADRON.—Urban District Council works. Mr. Frank Latham, C.E., Penzance:—

Heamoor Sewerage Scheme.

Chas. Lang	£3,213	Geo. Miners*	£2,786
W. C. Shaddock	2,9 7	C. Brealy	2,181

Heamoor Water Supply.

Thomas & Sons	£2,455	Geo. Miners	£1,884
Chas. Lang	2,397	G. H. Davies*	1,870
W. C. Shaddock	2,388	C. Brealy	1,216

Tolcarne Water Supply.

Chas. Lang	£1,943	Stephen Rodda*	£1,495
W. C. Shaddock	1,927	Geo. Miners	1,488
Thomas & Sons	1,852	C. Brealy	1,380

MANCHESTER.—For the easterly portion of the new Church of St. George, Abbey Hey, Gorton, including chancel, vestries, chapel, &c., and two bays of nave, on behalf of the Building Committee. Messrs. C. K. & T. C. Mayor, architects, 41, John Dalton-street, Manchester:—

Burgess & Galt, of Ardwick* £3,750

MERTON.—For erecting Rutlish Science School Merton, Surrey. Mr. H. G. Quartermain, architect, Merton. Quantities supplied by Messrs. J. Leaning & Sons:—

Bulled & Co.	£4,382	Garrett & Sons	£4,178
Holliday & Greenwood	4,277	Lorden & Sons	3,944
Killby & Gayford	4,256	Smith & Sons	3,939
Gough & Co.	4,254	Parsons & Townsend	3,750
Wall & Co.	4,200	Burges & Sons	3,625

NEW MALDEN (Surrey).—For the contruction of the first portion of the roads and sewers on the New Malden Station Estate, for Colonel G. A. Petter. Mr. James Neale, F.S.A., architect and surveyor, 10, Bloomsbury-square, W.C.:—

Rawlings & Son	£11,549 0	S. Kavanagh*	£10,664 14
W. H. Wheeler	11,391 0		

* Withdrawn. Channelling omitted.

REIGATE.—For the erection of four cottages, Upper West-street, Reigate, for Mr. A. A. Pepper. Mr. C. E. Salmon, architect, Bell-street, Reigate:—

Peters & Son	£1,260	A. B. Apted	£1,084
Lee & Son	1,150	C. B. Roberts	995
E. Worssell	1,150	Thomas Nightingale, Reigate*	975
Elsey & Sons	1,134		

WANDSWORTH.—For alterations and additions to the Medical Officer's House, Wandsworth, for the Guardians of the Wandsworth and Clapham Union. Mr. Cecil A. Sharp, architect, 11, Old Queen-street, Queen Ann's Gate, S.W.:—

Merredew & Co.	£1,410	Foster Bros.	£794
F. Bendon	1,196	R. A. Jewell	749
Wilson, Bros., & Lamplough	890	F. Clarke, 92, North End, Croydon*	586

WREXHAM.—For the erection of schools for the Governors. Mr. J. H. Phillips, architect, Olive Chambers, Windsor-place, Cardiff:—

J. E. Evans	£12,575 0 0	Lewis Bros.	£9,585 0 0
Davies Bros.	9,981 14 0	E. H. Nicholas	9,470 17 3
Jas. Hughes	9,900 0 0	W. E. Samuel, Wrexham*	9,425 0 0
Gethin & Co.	9,725 0 0		

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's architect:—

ALBION HALL AND SWIMMING BATH (Dalston).—For new fire hose, &c., and periodical cleaning of fittings:—

	For Hose and Fittings.	For Examining, Cleaning, Oiling, &c., twice a year, per annum.
Heathman & Co.	£5 9 3†	£0 13 0
Merryweather & Sons, Ld.	5 2 0	1 11 6
Shand, Mason, & Co.*	4 10 0	1 10 0

† This amount is inclusive of 5s. for two hose coupling wrenches.

CHURCH MANOR WAY SITE, PLUMSTEAD (Greenwich S.).—New School.—The Board of Education have sanctioned the erection of a school to provide accommodation for 800 children on the site which has been acquired in Church Manor Way, Plumstead. Finished plans of a school to provide accommodation for 830 places (viz., boys, 276; girls, 276; infants, 278) were passed by the Committee on February 11. The school is a three-story building, and contains the following accommodation:—Halls—Boys' and girls', 58 ft. by 34 ft.; infants', 57 ft. 3 in. by 34 ft. Classrooms—Boys' and girls', each, 60, 56, 48, 56, 56; infants', 60, 56, 50, 56, 56. Drawing classroom (1,260 ft. area). Also school-keeper's house. Heating by low-pressure hot-water apparatus and open fires. Area of site, 87,120 square ft. Playgrounds, area per child—Boys', 118 sq. ft.; girls' and infants', 64 sq. ft.:—

		If walls of classrooms and halls are plastered, add
F. & H. F. Higgs	£24,227	£299
Perry & Co.	23,842	287
Holliday & Greenwood, Ltd.	23,630	261
Lawrance & Sons	23,539	270
Garrett & Son	23,293	—
Treasure & Son	23,163	274
Kirk & Randall	22,847	249
Smith & Sons, Ltd.	22,545	279
Chessum & Sons*	22,281	33

HAVERSTOCK-HILL SCHOOL (St. Pancras).—Running contract for cleaning glass roof over hall:—

The Great International Plate Glass Insurance Co., Ltd.†	—
The City Window Cleaning Co.	£1 16 8 per clean.
J. Rayman*	1 10 0 " "

† This firm has tendered on a wrong basis.

KILMORIE-ROAD SITE, STANSTEAD-ROAD, FOREST HILL (Greenwich A.M.).—New School.—The Board of Education have sanctioned the erection of a school for 800 children on the site which has been acquired in Kilmorie-road, Stanstead-road, Forest Hill, and the provision of a manual training centre on the site. Finished plans of a school to provide accommodation for 908 places (viz., boys', 302; girls', 302; and infants', 304) were passed by the Committee on February 11. The school is a three-story building, and contains the following accommodation:—Halls—Boys', 55 ft. 1½ in. by 32 ft.; girls', 54 ft. 4½ in. by 34 ft. 7½ in.; infants', 54 ft. 4½ in. by 31 ft. 3 in. Classrooms—Boys' and girls', each, 60, 56, 50, 48, 48, 40; infants', 60, 56, 50, 50, 48, 40. Drawing classroom (1,090 ft. area). Also a schoolkeeper's house. Heating by low-pressure hot-water apparatus and open fires. Area of site, 87,120 sq. ft. Playgrounds, area per child—boys', 94 sq. ft.; girls' and infants', 79 sq. ft.:—

		If walls of class-rooms and halls are plastered, add
Garrett & Son	£24,786	£411
F. & H. F. Higgs	24,758	402
Antill & Co.	24,545	420
Kirk & Randall	24,172	407
Perry & Co.	23,689	425
Treasure & Son	22,931	305
Holliday & Greenwood, Ltd.	22,750	387
J. & M. Patrick*	21,787	309

MERTON-ROAD SCHOOLS (Southfields).—Enlargement.—Providing one 56 classroom for each department; redividing classrooms A and B into three rooms of 40 each for boys and girls; extending corridor and providing teachers' rooms for all departments; extending boys', girls', and infants' cloakrooms; providing new cloakroom and stockroom for boys, and converting temporary girls' teachers' room into a stockroom:—

General Builders, Ltd.	£4,363	J. Carmichael	£3,762
Allen & Sons, Ltd.	4,078	Johnson & Co., Ltd.	3,753
Garrett & Son	3,841	J. & C. Bowyer	3,686
Wall & Co.	3,832	O. Craske	3,643
Bulled & Co.	3,812	E. Triggs	3,548
F. & H. F. Higgs	3,805	J. & M. Patrick*	3,439

[See also next page.

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For the supply of gymnastic apparatus:—

Articles.	T. Cruwys. per ft. run. s. d.	Heath & George. per ft. run. s. d.	G. Spencer. per ft. run. s. d.	Adolf A. Stempel per ft. run. s. d.
Rib-stoll, fixed and finished	11 0	11 6	11 0†	8 4
Double portable boom, including standards, sliding-seats, &c., fixed in position	7 0	7 0	5 10	8 1
Low forms, fixed in position	1 11	2 0	2 3	2 1
Portable horizontal ladder, with the necessary fittings, fixed in position	7 0	6 0	6 0	9 5

† Mr. Spencer subsequently notified that a mistake had been made in this item, which should read 10s. 6d. per ft. in place of 11s. per ft.

The work at the following schools will be executed during the summer holidays—July 25 to August 24, 1901. Where exterior as well as interior work has to be done, the contractors will be allowed an additional week for the former:—

BREWHOUSE-LANE.—Painting interior and exterior:—

G. Barker	£225 0	Wall & Co.	£189 0
Corfield & Co	206 0	Gibb & Co.*	183 0
		J. E. Holliday	157 8

BYRON-STREET.—Painting exterior:—

Vigor & Co.	£239 0 0	J. Haydon	£187 15 0
T. H. Jackson	197 14 9	G. Wales	185 0 0
Gibb & Co.	189 0 0	J. T. Robey*	182 0 0

DALGLEISH-STREET.—Painting exterior:—

A. W. Derby	£181 0	G. Barker	£150 0
Vigor & Co.	164 10	J. Dolman & Co.	150 0
J. T. Robey	155 0	D. Gibb & Co.*	139 0

DEMPSEY-STREET.—Painting interior and exterior:—

A. E. Symes	£966 0	Gibb & Co.	£711 0
Dolman & Co.	751 0	A. W. Derby	690 0
Corfield & Co.	729 0	G. Barker	665 0
Vigor & Co.	712 10	J. F. Holliday*	575 0

EARL-STREET.—Painting exterior:—

E. Proctor*	£205	Vigor & Co.	£195

LAURISTON-ROAD.—Painting exterior:—

Silk & Son	£154 15	C. Willmott	£140 0
Barrett & Power	150 0	Corfield & Co.*	138 0
Dolman & Co.	150 0	G. Wales	131 0

ORCHARD-STREET.—Painting exterior:—

C. Willmott	£139	Silk & Son	£125
Barrett & Power	135	Corfield & Co.*	116
		G. Wales	£90.

PAKEMAN-STREET.—Painting interior:—

Grover & Son	£392 0 0	G. Kirby	£366 0 0
T. Cruwys	388 0 0	Stevens Bros.	346 0 0
Wall & Co	382 0 0	C. & W. Hunnings*	228 17 6

PURRETT-ROAD.—Painting interior:—

Johnson & Co.	£470 0	E. Proctor	£268 0
Hayter & Son	330 0	H. Groves*	266 10

SPRINGFIELD.—Painting interior and exterior:—

W. Hornett	£662 0	Rice & Son	£623 0
E. B. Tucker	658 0	King & Son	599 0
G. Triggs	649 0	Lorden & Son	555 15
Lathey Bros.	630 0	Garrett & Son*	538 0

SWAFFIELD-ROAD. Painting interior and exterior:—

R. S. Ronald	£719 8 6	Johnson & Co., Ltd.	£449 0 0
J. & M. Patrick	575 0 0	Garrett & Son*	436 0 0
Maxwell Bros., Ltd.	495 0 0	Lorden & Son*	422 15 0
Rice & Son	469 0 0	J. & C. Bowyer	310 0 0

UNION-STREET.—Cleaning interior:—

Johnson & Co.	£250 0	H. Groves	£169 10
W. J. Howie	190 0	A. Proctor*	160 0

VICTORY-PLACE.—Painting interior:—

Johnson & Co.	£565 0	Sayer & Son	£452 0
W. Downs	523 0	E. B. Tucker*	388 10

WALTON-STREET.—Painting exterior and cleaning interior:—

W. Brown	£189 10	W. R. & A. Hide	£163 10
C. Gurling	179 0	W. Hammond*	149 0
Lathey Bros.	179 0		

WHITFIELD-STREET.—Painting exterior and cleaning interior:—

T. L. Green	£398 0	Marchant & Hirst	£268 0
T. Cruwys	378 0	Brown & Sons*	245 10
G. Barker	328 0		

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The Builder.

VOL. LXXXI.—No. 3951 JULY 27, 1901.

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Architecture Considered as a Business.

THE question whether an architect's place of work is to be regarded as an "office" or a "studio" is closely linked to the other and larger question whether architecture is a "profession" or an "art." Which is the view adopted by the owner or tenant of the rooms one can judge pretty well at first glance on entering them. In the purely professional architect's "office" we shall see rows of drawers or other receptacles neatly labelled with clients' names and with the classified subjects of trade catalogues, and walls decorated with plans of estates and neat perspectives or photographs of desirable villas built on them. In the art-architect's "studio" one is likely to find, it must be admitted, less of order and regularity but more of variety and interest; models of various decorative details, treasured bits of wood-carving and mosaic and stained glass; perhaps a statuette or relief presented by a brother artist; and so on. The one regards himself as entrusted with the investment of other people's money in building, and the carrying out of buildings so that the client shall get the best commercial value for his money; the other regards himself as commissioned to produce something which shall be a work of art, and does not concern himself much with routine or system of work provided the result be satisfactory from an artistic point of view. He may perhaps waste some of his client's money and of his own time, but this is forgotten if he produces a building of permanent beauty and interest. The "office" architect is probably much more punctilious both as to giving the client value for his money and getting value for his own time; he has everything cut and dried, and can account for every hour of his and his clerks' time; and his architecture is cut and dried also.

We are supposing examples of the two extremes. There may be modifications; but only we think on one side. An architect whose great concern is to produce artistic and beautiful buildings may nevertheless be methodical and businesslike in his habits; it is better that he should be so, and there is no reason in the nature of things why he should not. But we doubt if the architect whose first thought is order and method and punctuality ever gets beyond orderly architecture. As Crabbe says, after describing how "The Learned Boy" lettered and arranged his books before beginning to read them—

> "The love of order—I the thing receive
> From reverend men, and I in part believe—
> Shows a clear mind and clean, and whoso needs
> This love, but seldom in the world succeeds;
> And yet with this some other love must be,
> Ere I can fully to the fact agree."

We do not see much indication of the "other love" in the book on office management which has mainly suggested these remarks.* Mr. Kaye Parry, who we see is a member of the Institution of Civil Engineers, as well as a Fellow of the Institute of Architects, writes his book "for architects and engineers;" judging from the whole tone of it, he evidently regards architecture purely as a business; and in truth we do not see that any man who gave so much attention to the elaboration of system in business routine would be likely to have much thought to spare for the higher side of the pursuit of architecture. At the same time there is the other side of the truth hinted at by Crabbe, that people without order and method seldom succeed in life; and to those who have not realised the desirability of method Mr. Parry's book may afford valuable suggestions, without their thinking it necessary to follow the author into all the details of his system.

If architecture is to be carried on as a business, the author's suggestions in the first chapter in regard to office organisation and the keeping by every assistant of a diary of his work are admirably to the point. On his system, as he says, the principal will always know what fees he ought to charge for any out-of-the-way and miscellaneous professional work; and where architecture is pursued with the end of pocketing fees this is no doubt most desirable. It may even conduce not only to a definite judgment on the fee to be charged, but to expansion of the fee itself. We heard it said once of an eminent and very business-like architect (long since dead), that he would come down to make a survey of buildings for alterations with four assistants; two of them measured, two looked on, and the principal talked to the client, and charged for his own time and four assistants. But this was in the good old days. To say that there are some people who would rather name a round sum, even a little under the mark, than be troubled with these book calculations, would no doubt seem to Mr. Parry a painful example of human weakness and wrongheadedness. But if it is desired to keep this accurate record, the form of "Every Hour Diary" recommended by the author, and issued by a Dublin publisher, has the great merit of simplicity. And we quite concur with the author's advice to have an "Engagements" diary always in the pocket; engagements should be entered on the spot and at the moment, or it is not certain that they will be entered correctly, if at all; and whatever view our readers take of the architect's calling, we hope they will all be of one mind in considering that punctuality in keeping appointments is a virtue absolutely required from every member of the human society. A man who is not punctual to his appointments is not only his own enemy—as he will discover in the light of a fading practice—he is the enemy of the human race; he wastes the time of blameless fellow-men who have taken him at his word. The first steps towards this vice should be resisted. As De Quincey well says, a man who has once committed murder will not stop there; he will take to burglary; you will next hear of him as a drunkard and a Sabbath-breaker, till he finally sinks into procrastination and unpunctuality. Against such a fate a handy pocket engagements book, duly used, is at least the human means of salvation; and we agree as to the form of it; it should consist chiefly of dated blank pages for writing in, not burdened and made cumbersome for the pocket by the addition of many pages of printed matter which the bearer does not need, at all events, while travelling about.

On the question of regularity in office hours we are a good deal in sympathy with Mr. Parry. He asserts, however, that there is a great laxity in many offices as regards office hours; and if in this sentence he refers, as apparently he does, to the staff, we cannot judge whether he is right or not,

* Office Management: a Handbook for Architects and Civil Engineers. By W. Kaye Parry. London: E. & F. N. Spon. 1901.

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as we have no means of knowing, and we cannot understand how Mr. Parry knows, unless he makes it part of his business to call at early hours at other men's offices and find out whether the clerks have arrived. For our own part, we have rather a conviction that in the main architects' assistants are a great deal more regular in hours of attendance than their principals. As a rule we are inclined to think that the young men who are articled pupils of architects, or who, from having been articled pupils, have soared —if it be soaring—into the position of paid assistants, are a very conscientious race in regard to their duties towards their master or employer; few or none more so. The principals are, no doubt, on different lines, equally conscientious men; but it is very difficult (and here we have some experience to go upon) to catch them at their offices. Unless you have made an appointment with him, we do not know that there is any kind of professional man (if he is "professional" —there we go round the circle again) whom you are so unlikely to find at his office as a London architect of any standing. Almost the stereotyped answers are either that "Mr. —— is not in, and we cannot say when he will be," or that "he will not be here to-day." In comparison with some other professions, this is of course to a certain extent comprehensible. An architect who takes interest in his work goes about a good deal to inspect it; and an architect who gives thought to his designs finds he can best elaborate them at home, where no one can interrupt him. Still, we cannot but think that architects would be wise to have, more often than most of them seem to have, a definite time when they are to be found at their offices, God willing and weather permitting. With the recommendation that the principal will best ensure regularity of attendance by himself keeping the same hours as his staff we are very much in sympathy; there is a wholesome and honest ring about it, and at all events we think it should be followed in regard to the time of arriving at the office. There is nothing better for the progress of work, and (proverbially) for the health of the worker, than an early start. Whether the doctrine is to be pushed to the length of keeping the same hours altogether is another matter. It is one of the dearly-bought privileges of a man who has struggled into a good position in his profession, to be able to feel that he is the master instead of the servant of his time. If he chooses to go off on a bicycle run on a fine afternoon, and make up for it by working at night, he has earned the right to do so. But he should remember that his pupils and assistants, who have not yet gained the pinnacle, have a right to definite hours of leaving off as well as of commencing work. That is their standard of liberty, with which his own must not interfere.

With the author's remarks and recommendations as to the orderly conducting of correspondence we are entirely in agreement, and especially with the recommendation that the day's letters should be opened and the replies dictated before any other business is entered on. And here comes in one of the great advantages of early hours on the part of the principal. Quality and style of letter-paper too, as Mr. Parry observes, is not without its importance, as unknown correspondents judge of a man's status to some extent from these indications. Heading the letter-paper with the architect's name is a frequent practice, but in our opinion not "good form," nor can we call to mind any architect of the highest position who adopts it. The omission of the printed name, however, renders it incumbent on the architect to sign his name legibly and not in a cryptic style; a matter in which men in many professions besides architecture are culpably careless. Then they write unreasonable complaints that their names are wrongly spelt in a paper or a document—the fault lying with themselves.

In regard to the conducting of the correspondence the author remarks—

> "It is most unwise to entrust any one with the responsible task of opening letters addressed to the firm or to the individual professional man. It is scarcely necessary to add that it is destructive to discipline to permit either a client or contractor to address a letter to any member of the staff on any business matter. This must be put down at once, with much firmness, if the principal is to be the master.
>
> Some professional men allow their confidential clerks to receive letters relating to office matters, but it is a practice which cannot be too strongly condemned."

We are inclined to think it is a not uncommon practice in large offices, but we entirely concur in the condemnation of it. It is not only a question of discipline as regards the principal's position in his own office; there are also the rights of the correspondent to be considered. A correspondent may write a letter to the principal which, without thinking it necessary to mark it "private," he nevertheless would not have wished one of the clerks to read; and it may be a considerable annoyance to him to find that the privacy of his communication has been invaded.

Questions of businesslike procedure with regard to an architectural practice may be divided into those which only concern the internal economy of the office, and those in which the interests of outsiders are implicated. The question of the disposal of drawings of works in progress, and still more of those which are completed, and which accumulate to such a formidable extent in a large office, is a serious one which perhaps is not very often dealt with as systematically as it should be. Mr. Parry makes one very simple but really invaluable suggestion, to the effect that each new work, as soon as drawings of it are commenced, should be distinguished by a number, which should be affixed to or imprinted on every copy of drawings or specification referring to that work. There is an immediate convenience in the saving of a great deal of long title-writing on each drawing; but this is doubly apparent when the drawings have to be stocked for preservation and for possible future reference. No system of storage ought to be considered as satisfactory which requires drawings to be either rolled or folded into creases. In a year or two such drawings, if they have to be taken down for use for alterations or additions, have acquired a "set" which renders them very difficult and irritating to deal with. The author contemplates that such drawings may be rolled and pigeon-holed, but he also suggests a better method, viz., binding them with brown paper along the left-hand margin, and letting them lie over one another flat, on shelves, which must be pretty numerous and close together, otherwise the weight of the mass will make it difficult to extract the lowest layer from the shelf. And here comes in the value of Mr. Parry's system of *opus* numbers, for each bound parcel can have its number written large size on a card or label to be fixed to the outer left-hand corner of the parcel, and as the consecutive order of the numbering should always be preserved, the drawings under any number can be found and produced at once. The system would probably take up a little more cubic space than rolling or folding and pigeon-holding, but its increased convenience and readiness should more than compensate for this. Another excellent suggestion of the author's is the keeping of a book of tear-out forms for the requisition of drawings asked for by contractor or client. Contractors frequently have cause to complain that they are kept waiting for detail drawings which they require, and then there comes the chance that no one in the office admits to knowing of the request. Mr. Parry's system is that it should be the duty of any assistant, or of the principal, immediately on being applied to for a drawing, to fill up and date a requisition form for it, giving the *opus* number of the work and the definition of the drawing required. This is to be handed to the head draughtsman, who files it till the drawing is made, and returns it with the drawing and with the date of its being furnished filled in. Until the drawing required is furnished, the requisition order on the file is a standing reminder of it.

On the other hand, the author's chapter dealing with what some people will be disposed to call "the catalogue nuisance" is a great deal too serious. He seems to regard it as a necessary part of a well-conducted practice to file and index every trade catalogue sent in, and has an elaborate system by which any one of them can be turned up at a moment's notice. He is even sarcastic at the expense of those who do not see this:—

> "For those architects who prefer to muddle along anyhow, and whose lofty souls will not stoop to such trifles as the mere arrangement of catalogues, these observations will have no attractions, and the writer has neither the desire nor the power to win converts from such a class."

That such catalogues as the architect judges it worth while to keep by him should be themselves catalogued, or arranged on such a system that any one can easily be found when required, or replaced by a new edition from the same firm, is of course a mere matter of common-sense; but when the author offers his elaborate system for enabling the users of catalogues "to reduce their brain-worry and actually lengthen their days," it may be suggested that a more direct way of achieving this end would be to drop three-fourths of such catalogues into the waste-paper basket. Any architect with his wits about him can judge from a momentary inspection whether a catalogue sent to his office is likely to be of use to him, or to offer him anything better than he has previously had from other firms in the same line of production. If not, it is much better thrown away. There is nothing more unwise than changing from one firm to another for the mere sake of change, or to "give another firm a turn," or even (a reason that seems to be hinted at by the author) to impress your client with your all-round knowledge of everything that is in the market. An archi-

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tect who has once found a firm turn out perfectly good and reliable articles in any special line, will be wise to keep to that firm, and will probably do best for his clients in doing so. And if he goes on that system, a very moderate stock of catalogues will serve his requirements.

In regard to some of the more important points of business procedure in which the interests of others than the architect himself are concerned, Mr. Parry, whose views on questions of this kind are of the soundest kind, refers among other things to the great importance of the architect commanding the full confidence of contractors tendering. As the author puts it, "the higher the character which the architect has for honest straightforward dealing, the better value he will get for his clients. On the other hand, if contractors or business firms fear that the architect may exercise favouritism, they will certainly protect themselves by putting on an extra 5 or 10 per cent." It is also indubitably true that the more complete the drawings and specifications are, the closer will be the tendering. There is, however, another possible explanation of great differences in tendering, besides the two which Mr. Parry names—ignorance on the part of the firms tendering, or ambiguity of plans and specifications. Firms occasionally tender high because they do not want formally to refuse an invitation, but have reasons for not wishing to undertake that particular work. From a further passage in this chapter ("Estimates") we gather that Dublin practice differs a good deal from London, and that the quantity surveyor is not so all-pervading on the banks of the Liffey as on those of the Thames. Under the heading, "Information for Competitors," we read:—

"When no bills of quantities are prepared, each competitor should be furnished with a complete set of copies of the plans and a complete copy of the specifications. These they should be permitted to retain until they send in their tender.

When the tenders are sent in, the plans and specifications should be returned at the same time in a separate envelope suitably endorsed."

The system under which the plans are sent out, with a form attached to them and an envelope for their return, is described; the author does not mention on what system the copies are made. On a previous page of the book he recommends the tracing of drawings in ink from the pencil originals, as more expeditious than putting the latter into ink, and observes that these tracings can be copied by photography for contractors; so they can, as line drawings, but what becomes of distinctive colouring for showing different materials? However, if the drawings were all traced or copied and coloured in several editions, the cost to the client would be much less than that of the quantity surveyor's fee, and the advantage of the system is that it compels the contractor to acquire a personal acquaintance with the drawings of the building he is to carry out, which on the London system he may waive altogether, tendering on the quantities only, and not even knowing what the building is like. Of course the *mot d'énigme* of the situation is that in London profits have been cut so close in competition that builders do not consider it worth their while to tender at all unless they have the quantities cut and dried; but the Dublin system as described by Mr. Parry is a sounder one—provided always that the plans and specifications are full and accurate in every particular; it all turns on that.

Mr. Parry's chapter on "Certificates," which necessarily enters a good deal into the relations of the architect both with client and contractor, is in the words of wisdom from beginning to end, and we recommend its perusal to all young architects. They could not have better advice towards avoiding difficulties with, and doing their duty to, both parties, between whom the architect is properly and naturally an arbitrator, whose duty it is to protect the contractor as well as the building-owner from injustice, although the author mentions that an irate client once stated the case thus—"I pay you, and therefore you should side with me"; an argument which was not, however, allowed to be valid. It is seldom put as crudely as that, but perhaps represents a vague misconception to which the client mind is from time to time liable. The author's advice to the architect, to take every means to let his client have as clear an understanding as possible of what the plans mean, what he is to expect from the building and what he is not to expect, should be duly weighed by the young architect. Clients often feel disappointment and dissatisfaction on the completion of a building from not finding something which they expected, and as to which they might have been enlightened at an earlier stage of the work.

To those who regard architecture mainly as a business to make money by, we should imagine that Mr. Kaye Parry's book would be a kind of professional bible, unless they may possibly consider that some of the items of office administration described are, like the system of catalogue-keeping, more complicated than they are quite worth. To those who regard architecture as an art to be practised for higher ends than mere pecuniary success, a good deal of the book will probably appear to be concerned with matters which are no part of an architect's business at all, and only calculated to burden the mind with details which would interfere with more important considerations. Yet we advise these also to look through the book, for they will find valuable suggestions in it on some important practical considerations which those who pursue architecture as an art and not as a business are sometimes too apt to overlook.

NOTES.

The New Government Offices. On Tuesday night, in the House of Commons, Mr. Whitmore elicited from the First Commissioner of Works, in answer to a question in regard to the carrying out of the design of the late Mr. Brydon for the Government offices in Great George-street, the statement that it had been definitely decided that Mr. Brydon's building, "all the plans of which are in my possession," shall be carried out by the officers of the Office of Works Department. In answer to a question from Lord Balcarres, as to what would be done with the balance of the 26,000*l.* allotted for the architect's fees, it was replied that it was hoped that thereby "a considerable saving would be effected." Every one who knows the ways of English political life knows what this means. The Treasury wants to get the balance of the money, and the architect having unhappily died, it is supposed that any further expenditure on architect's fees may be saved. This may be merely stupidity; but if so, it is a degree of stupidity which, in the case of any one holding the position of First Commissioner of Works, is really culpable. Mr. Akers-Douglas says he has got all the drawings, *i.e.*, he has got the general plans and elevations; but has he got the detail drawings? And is he so en irely ignorant of architecture as not to know that the very life of such a building, architecturally, consists in the manner in which the details are worked out by the architect? There is not the slightest chance that the building will be properly carried out by the Office of Works; we know only too well what sort of work they will turn out. The only right thing to do is to appoint the best and most scholarly man in Classic architecture to design the detail of Mr. Brydon's building as he might have designed it himself had he lived. If this is not done, the building on which half a million or so is to be spent will infallibly be spoiled to save a few paltry thousands. If any such procedure were proposed in France in the case of a great building of which the architect had died, it would be considered a public scandal; and we do not believe it will be allowed to pass, even in this ignorant country, without a very decided protest from the minority who do know something about architecture.

The Small Art Palace at Paris. The Municipal Council, Paris, as mentioned in a footnote to our last "Letter from Paris," have decided on the use of the smaller Art Palace on the Champs Elysées as an Art Museum for the city, and it will henceforth be known as the "Palais des Beaux-Arts de la Ville de Paris," and will receive the collections of works of art which are at present scattered in various places—at the Hôtel de Ville, in other municipal buildings, and in the Magasins des Beaux-Arts at Auteuil. The "Chef de Service des Beaux-Arts" of the Municipality, who will be charged with the arrangement of the new Art Museum, proposes to supply one thing that is wanting at the Luxembourg, by forming a special architectural gallery, in which, along with the principal architectural drawings executed since 1870, will be placed the models of the Hôtel de Ville, the new Sorbonne, the Vaudeville Theatre, the churches of La Trinité, St. Joseph, and other buildings. The lofty gallery along the principal front will be reserved for sculpture, and will have, as its central object, M. Frémiet's group of St. George and the Dragon. The semi-circular gallery around the central garden, which is top-lighted, will be reserved for paintings, and the outer concentric gallery, lighted from the side, will be devoted to engravings, drawings, and special exhibitions. The rooms in the basement will serve for meetings, and committees, and lectures, and for storing sculpture models and casts, and may also be of use for various temporary exhibitions. Under these circumstances M. Girault's beautiful building will probably prove, to lovers of art, one of the attractive places in Paris.

Mr. Long on the Housing Question. We wish very much that responsible politicians would deal less in generalities. Mr. Long, the President of the Local Government Board, made a speech last week in which he figuratively laid his hand on his

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heart and expressed the importance with which he regarded the housing question. But not one single practical remark did he make. He said nothing definite about future legislation, nothing about the action of the Local Government Board in putting pressure on local authorities, nothing as to the working of the Act of last Session by which District and County Councils were under certain circumstances to improve the housing accommodation in rural districts. Mr. Long was satisfied to utter semi-platitudes. Every one appreciates the importance of the subject, and unless a Cabinet Minister has something authoritative to say on this question he had much better hold his peace. From Mr. Long's speech we should judge that the Government has no intention of legislating on this subject; perhaps it is as well they should not bring in a Bill, for they would hardly have the energy to pass it into law.

Trades-Unions and Corporations.

THE decision of the House of Lords this week in what is known as the Taff Vale Railway case is one of far-reaching importance. By that decision the House of Lords have overruled the judgment of the Court of Appeal and have restored that of Mr. Justice Farwell, who held that the Amalgamated Society of Railway Servants could be sued as a corporate body. It is clear that if such a body is liable to be sued, it may become responsible for damages for libels, and its action may be restrained by injunctions from the High Court. Its activity may thus in times of labour disputes be considerably curtailed. This development of the law appears to be entirely in accord with common sense. It would be absurd for combinations of persons, whether artisans or capitalists, to be at once powerful and irresponsible. It is a remarkable and a satisfactory feature of English law that it is constantly accommodating itself to the changes of modern society. There are some who, rightly enough, complain of its want of form, but its very want of symmetry enables it to conform to changing circumstances.

Piccadilly and the Green Park.

IN view of the Coronation ceremonies next June, the widening of Piccadilly along its southern side, by the taking of a strip out of Green Park and the setting back of the railings, will soon be put in hand. Some plans prepared at the Office of Works provide for an increase of the width of the thoroughfare which varies from 68 ft. to about 100 ft. between Walsingham House and Hyde Park-corner, so as to vary from 72 ft. at Walsingham House to 90 ft. at Park-lane, 120 ft. at Hamilton-place, and 170 ft. at the western end by Hyde Park-corner. We understand that whilst the Office of Works will defray the cost of altering the levels of the ground and paths within the park railings, the London County Council will be asked to pay a sum estimated at nearly 30,000*l.* for the widening of the roadway and of making a new pathway, 24 ft. wide, along the outside of the park railings in their new position. The Ranger's Lodge, by Robert Adam, 1768, was pulled down in 1820, and when Lord Duncannon was First Commissioner for Public Works the Queen's Basin, a reservoir of the Chelsea Waterworks, at the north-eastern corner and Cowford Pool fed by the Tyburn, in the valley of the Park, were filled in (1842).

The New York Elevated.

THE electrical equipment of the Manhattan Elevated Railway has been practically completed. As it has 75 miles of line and the 200 trains operating on it carry about 200,000,000 passengers per year, it has been a gigantic undertaking, and the American engineers are to be congratulated on the skill with which they have carried out a daring design. Engineers in this country were inclined to think Mr. Parshall rash when he recommended 1,200 horse-power dynamos for the power-station of the Central London Railway and pointed out the stresses that there would be on a rotating armature weighing 48,000 pounds. These machines are, however, dwarfed by the eight alternators erected in the Manhattan Power Station. Each of these is 7,000 h.-p., and each armature weighs 370,000 pounds, *i.e.*, 165 tons. The efficiency of these machines is guaranteed by the makers to be 97 per cent. at 25 per cent. overload. It will be seen that there is not much room for effecting economies by improving the electrical efficiency of a dynamo. As on the Central London Railway, the third rail system is employed, and to protect workmen from accidental shock and to guard against short circuits by accidental contacts, wooden guard strips 2 in. higher than the rail are fixed on each side of it. This simple precaution might be adopted with advantage on several of the electric railways in this country. The electric current leaves the three-phase alternators at a pressure of 11,000 volts and excites ordinary transformers at the sub-stations. From the low tension terminals the alternating current at 390 volts passes into rotary converters and comes out as direct current at 625 volts at which pressure the third rail is maintained. The power required at this rail is 60,000 h.-p. during "rush" hours and 5,000 h.-p. for the remaining period, the average being about 30,000 h.-p. Unlike the Central London Railway the stations are not elevated above the mean level of the track; and hence the saving of power at the start on the down gradient and the reduction of the braking force required to a minimum on the up gradient, cannot be effected. It is stated that the saving effected by this means on the locomotive working expenses of the Central London Railway is thirty per cent.

Sanitary Work in Liverpool.

THE Annual Report of the Medical Officer of Health for Liverpool is of course largely occupied with matters of purely medical administration. There is evidence, however, that the Liverpool authorities are persevering in their efforts to improve the sanitary condition of dwellings. The courts and alleys continue to decrease in number, owing to the demolition of low-class property for the extension of business premises, or to the removal of insanitary property by the Housing Committee. During the year all courts and alleys having covered entrances were specially washed down and hosed by the scavengers (this appears to be done out of the rates). On the other hand one must regret to see that a most useful clause inserted in the Liverpool Corporation Bill of 1898 to enable the Corporation to make by-laws in regard to the lighting, ventilation, drainage, and general construction of stables, which was confirmed by the unanimous vote of the City Council, was thrown out at the town's meeting, "by persons who gave no reason for their objection to it." The reason could indeed hardly have been a good one. Private, domestic, and office drains are flushed by the City Engineer's staff twice a year; this is a practical recognition of the fact that fouled or impeded drains are a danger to public health, and do not concern only the owners of the drains. Under the head of "insanitary property" we learn that during the past ten years an approximate average of ninety-seven courts, or 679 houses (of an insanitary character), have disappeared annually, somewhat more than half of these having been demolished under the order of the Insanitary Property Committee (now called the "Housing Committee"), the rest having been removed in other ways—some few under the order of the Building Surveyor as being unsafe, but most have been taken down to make room for business buildings. In regard to the provision of dwellings for persons turned out of property which is thus demolished, the Medical Officer remarks:—

"In advocating the desirability of re-housing the people near to their work, the opinion is from time to time expressed that the same number of people who have been displaced must be re-housed upon the sites from which the insanitary property has been removed. No consideration is given to the fact that if this is done the congestion of the people will be as bad as ever it was, nor is it taken into account that in many instances the sites themselves are wholly and entirely unsuitable for the working classes by reason of surrounding warehouses and lofty buildings which shut out the sun, or by reason of the low-lying situation of the sites. Another circumstance which is lost sight of is the fluctuating character of the work, thousands of labourers and their families shifting from place to place and following the work of the contractors at one time at one part and another time at another part of the city. At present the tendency is to locate in the neighbourhood of the Queen's Dock, where extensive works are about to be carried on. Indeed, as the result of a careful inquiry taken in one of the most densely populated labourers' streets, it was found that considerably more than 50 per cent. were engaged in work from a mile and a half to two miles away from their place of residence. These facts prove the practicability of providing for some at least of the dispossessed tenants in the less crowded parts of the city, but within easy access of tram and train."

Unfavourable Conditions in St. James's.

UNDER this heading Dr. Edmunds, in his Report as Medical Officer of Health to the City Council of Westminster, draws attention to the need for doing something to provide more residences or else more transport for the large number of employees in establishments in Bond-street, Piccadilly, and Regent-street. He says that a vast and growing retail trade for fine goods has encroached upon the neighbourhood of Bond-street, Piccadilly, and Regent-street, while the workers in connexion with it have never been provided with facilities for access to the suburbs, in which they ought to live. Imprisoned, under these circumstances, by the exigencies of their work in St. James's, and by the want of cheap, rapid, timely, and comfortable transport to the suburbs, the cost of lodgings has become insupportable. Also that fashionable tailors, court dressmakers, and other retail trades, which have centred themselves in St. James's, employ a vast army of specialised and highly skilled workers. "If these workers are not to crowd into the

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hinterland of St. James's, they must be provided with morning and evening transport between their work-places and their homes—at such hours as will suit their business purposes, so rapid as not to waste time, so cheap as not to encroach too largely upon their wages, and so comfortable as not to fatigue them unduly." From other passages in the Report, we gather that the Medical Officer regards the new form of tube railway as specially suited for the provision of cheap transit to lodgings or dwellings on the outskirts of London. Referring to the congeries of narrow streets east of Regent-street, we quite concur in the opinion that a new street driven through this quarter, parallel to and east of Regent-street, would have a most beneficial effect, increasing the value of sites and leading by degrees to a rebuilding of the whole of this disorganised and labyrinthine area.

Otterburn Tower, Northumberland.

THIS property, comprising about 1,320 acres, with the Manor of Otterburn, has been placed in the market. It is situated on the north bank of the River Rede. The "Tower," upon the east side of the burn, retains some portions of the earlier stronghold during the Tudor period of the Hall family, which was forfeited at the attainder of John Hall who suffered execution of sentence at Tyburn for his share in the "'15." In the Otterburn Ward of Elsdon, at the meeting of the Otterburn and Rede, is the site of the battle fought on August 10, 1388, between the Earl of Northumberland and his son, Sir Henry Percy, Warden of the Marches, and an invading army of Scots led by the Earls of Douglas, Moray, and Dunbar. As they were returning to Jedburgh from Newcastle the latter forces entrenched themselves at Greenchesters, where their camp may yet be traced. Froissart describes the encounter, and upon the old ballad is founded the modern one of "Chevy Chace." The property was withdrawn from sale, at 24,000*l.*, on Tuesday, at the Mart.

The Parish Church, Wymondham.

WE learn that Mr. W. S. Hicks has been appointed as architect for the proposed restoration, at an estimated cost of about 20,000*l.*, of the parish church of Wymondham. The fabric embodies the nave of the church of the abbey which, having been valued at 72*l.* 5s. 4d. per annum, was granted at the Dissolution by Henry VIII. to the Earl of Surrey. The abbey, as so constituted in 1448, had been originally a priory of Black monks founded by William D'Albini, or Daubeney, in 1130, as a cell to St. Alban's, and largely endowed by Henry I. The western tower, with octagonal buttress turrets, was built in 1445-76 by the parishioners to whom the nave and north aisle were assigned in 1349, the choir and chapels being reserved for the conventual church of SS. Mary and Alban; the choir, north lady-chapel, and transepts have become ruined.

Sun Blinds.

IT is a matter of constant surprise that every year the summer sunshine finds the householder little better prepared to alleviate its drawbacks. During the hot weather of the present month any number of people have been inconvenienced and work and pleasure prevented by the want of sun blinds. With a good sun blind a room can be kept a number of degrees cooler and neither work nor pleasure is prevented, as they must be in a room with an abnormally high temperature. To be sure, in many London houses there are inside sun blinds. These, however, are the most useless of all contrivances. The glass behind them gets ever hotter and hotter, and in the winter they are no protection against wind and cold. Wooden sheets, whether plain or rayed, are the simplest of all these systems, and it is surprising that in country districts they are not more utilised. It is positively melancholy to see rows of suburban villas being so baked in a sunshine which is prized under favourable conditions, that the unfortunate occupant longs for the days of cloud and rain. We do not say that sun blinds obviate all the inconveniences caused by a hot sun, because too many English houses are built so that they are useless with a low or a high thermometer. But the universal use of sun blinds would do much to make life more agreeable in the dog-days.

THE ANNUAL EXCURSION OF THE ARCHITECTURAL ASSOCIATION.

THE headquarters of the Architectural Association for the annual week's study of English architecture in the field have been fixed at the ancient town and Roman settlement of Cirencester, a town hitherto unvisited by the Association, but forming an excellent centre for covering ground left beyond the radius of previous excursions from neighbouring centres as Cheltenham, Oxford, and Bath.

The official arrangements, followed by a large proportion of the members, made the departure from London on Saturday last by reserved carriages on the 3.15 p.m. train from Paddington, and the party thus travelling had, spite of the exalted state of the thermometer, a pleasant journey. The advance guard were joined by various detachments throughout Saturday and Sunday in readiness for the grand attack on Monday morning.

Sunday was spent, as is the invariable custom, quietly, a drive being taken by some of the party in the afternoon to the interesting Church of Northleach, dedicated to SS. Peter and Paul. This is a fine large church, with nave and aisles of five bays, a long chancel with north and south aisles, western tower, and south porch. From internal evidence the tower and south porch appear to have been added to an earlier church, possibly of thirteenth century date, at the beginning of the fifteenth century, and later on towards the end of the century, probably about 1489, the date carved on one of the corbels, the nave and aisles were rebuilt. The tower and porch are of vastly superior design to the remainder of the church, and admirable amongst the best examples of perpendicular wall, the porch having the additional interest of the readily decipherable iconography of the original sculpture.

Internally, there is much worthy of notice: an original stone pulpit and font; the mutilated remains of a stone reredos to the altar in the south aisle, still bearing clear traces of colour; a stone altar now in the vestry, which is hardly likely to be its original position, but which is more probably that of the south aisle. There are also the original roofs of the nave and aisles, flat in shape, moulded and carved, but not very richly; a triple sedilia of pleasing design in the chancel; stair to the rood loft on the north aisle wall; numerous brasses of wealthy traders and wool staplers. The piers of the nave arcade furnish one of the somewhat uncommon examples of concave-faced octagonal shafts. Some curious corbels on the second bay of the north nave arcade, which in detail reproduce the sections of the pier caps, afford a good opportunity for speculation and conjecture, which did not appeal to the architect members of the party to the extent that it might have done had they been archæologists. But on an excursion of the Architectural Association, archæology, pure and simple, is at a discount, design and building are the objects of study, beauty and truth the objects of admiration.

Returning, a short halt was made at Coln St. Denys for a glance at the exterior of the small but picturesque church, where a small central Norman tower has formed the stock on which the remainder of the construction has been subsequently grafted at various dates.

Monday.—Fortunately for the excursionists the intense heat of last week was at the start of their hard work moderated by a cloudy sky and north-west wind, whilst occasional bursts of sunshine prevented undue dulness of weather.

Starting eastward, the first halt was made at Ampney Crucis, where the church was the objective provided for study. This is somewhat small, but with considerable interest, commenced evidently at the very end of the twelfth century, with Transitional chancel arch, but mainly Early English, with Decorated and Perpendicular insertions and additions. The plan is cruciform without aisles, with south porch and western tower of sturdy proportion and simple battlemented skyline. The porch is of Perpendicular date, as is also the sanctus-bell cot over the chancel arch. Within the church, amongst the points of interest are some thirteenth-century colour decoration in fair preservation; a piscina with credence shelf in the north transept; Perpendicular nave roof of flat pitch with colour decoration; remains of stair to rood loft on the south side of chancel arch; some late monuments, particularly that of the Floyds or Lloyds, whose name appears amongst the earliest entries in the parish registers, which date from 1566. In the churchyard is a good example of a churchyard cross, which has been judiciously repaired, or rather re-erected, with clear indication by absence of moulding or decorative treatment of what is new and what is old. There is also in the village the relic of another cross, from which the place takes its name rather than from the churchyard cross, for these are in this part of the country too frequent to differentiate one village from a neighbour.

Adjacent to the church is the manor house, the drawing-room in which is the chief architectural interest, possessing a fine moulded plaster ceiling, wood panelled walls, and a remarkable chimney-piece with allegorical sculptured panel representing the Christian man's victory over the world, the flesh, and the devil, and enclosed in excellent architectural design. Thus the whole room is a perfect example of seventeenth-century work.

Proceeding still eastward the members then drove to Fairford, the small but ancient town whose chief attractions are the well-known stained-glass windows and the trout-fishing in the Colne river. The prosperity of Fairford commenced with the purchase of the manor from Henry VII. by John Tame, a wool merchant, whose business ability was more advantageous to the town than the regal possession of the Kings of Mercia in the ninth century or of Queen Maud at the time of the Doomsday survey. The glass is said to have been obtained by the somewhat piratical enterprise of John Tame who, in trading to Italy about the year 1492, is said to have captured a Flemish vessel bound to Rome with a quantity of stained glass on board, and this was utilised for Fairford Church, the erection of which was commenced by John Tame in 1493, and completed by Sir Edmund Tame after his father's death in 1500. How much of this story is true and how much allegorical legend of the Whittington type we cannot pretend to determine, but there is no doubt that the glass is Flemish work of the latter end of the fifteenth century, a time when commerce with Flanders was at its zenith and Fairford in the centre of the wool stapling industry. The church itself is well worthy of study as an example of the latest phase of Perpendicular, the central tower in particular being very clever in design, with that especial cleverness that is not absent altogether from the work of some of our younger prominent church architects of to-day, the cleverness whose effort is apparent rather than felt. This central tower is noticeable both internally for its lantern treatment and externally for its complication of plan and features. The chancel is enclosed by some exquisitely carved screens, and contains the original choir stalls with western seats *in situ*, misereres, and carving complete and perfect. Tombs, monuments, brasses, and colour decoration are all worthy of study, despite the overpowering attraction of the stained glass

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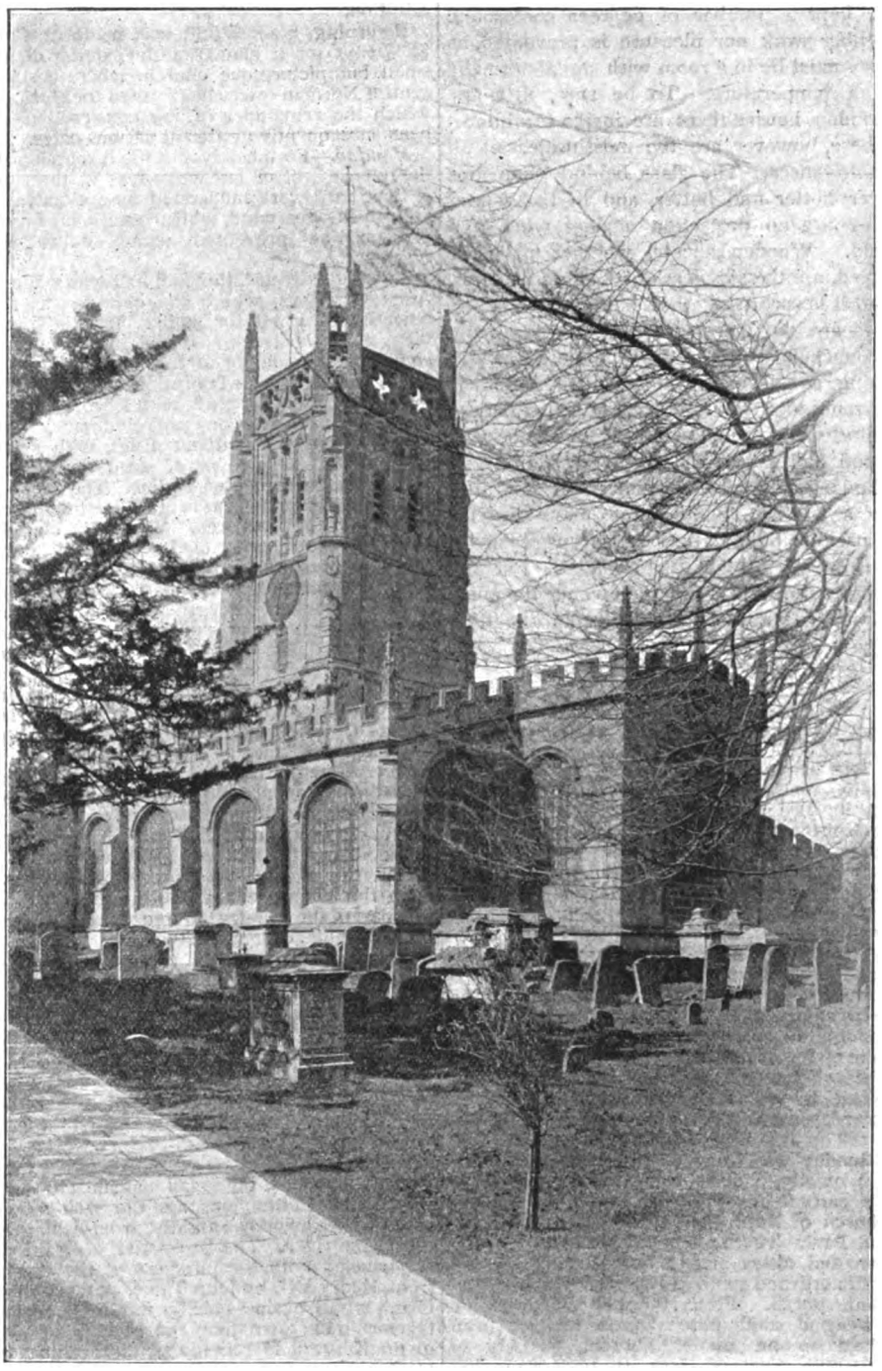

Photographed by J. W. Gardner.

Fairford Church.

From Fairford a forty minutes' drive brought the excursionists to Kempsford, a church restored by the late G. E. Street, simple in plan, consisting originally only of nave and chancel, with tower between them and north and south porches towards the west end of the nave. These porches enclose fine examples of Norman doorways, north and south of the nave, which is in origin of Norman date, whilst the chancel is thirteenth century. The tower, treated internally with fifteenth-century groining, adorned with heraldic insignia of John of Gaunt and other Plantagenets, and with large windows, has one of these filled with stained glass by Mr. Kempe, of which one need say no more than the artist's name to imply that it is admirable. In the chancel is a canopied tomb of fifteenth-century date to an unknown Canon Regular, whose effigy is in fair preservation, though sculptured subjects above in the canopy have been wantonly mutilated. The design is clever and peculiar. Street added a south aisle to the chancel.

The last item on the programme for the day was Down Ampney, on the borders of Wiltshire and Gloucestershire, and the property of the Hungerford family from the time of Richard II. to that of Charles I. Of their residence, the gatehouse, said to have been built by Sir Anthony Hungerford, stands extremely complete; the mansion, of which the great hall bears date 1537, is much diminished, altered, and mutilated. Near the house is the church, cruciform in plan, the nave with aisles, the transepts and chancel without. The tower is at the west end, the porch on the south side. The nave arcade is transitional, the tower Early English with a perfectly plain decorated spire. There are monuments of interest, the richest that of Sir John Hungerford, the earliest said to be that of Sir Nicholas de Vilers or Valers, whose effigy is in chain armour. Adjoining is a canopied wall tomb with female effigy, said to be that of the wife of Sir Nicholas de Vilers or Valers. This family held the manor before the Hungerfords, and the monument is supposed to be of the date 1294. In the chancel on the north side is another wall tomb, with the slab bearing only a floriated cross of rich design. Amongst the most interesting things in the church are the examples of modern woodwork and carving in the rood screen, reredoses, and north transept screen, the last incorporating some remains of the old gallery front with the name and arms of Sir Anthony Hungerford.

On the return a halt of two minutes was made at Latton, on hearsay evidence that there was a good Norman doorway. The evidence was correct, but the remaining interest of the church was infinitesimal.

Tuesday.—Still cloudy and with promise of rain; the cooler temperature, however, fully compensated the members for the lack of sunshine, and rendered work possible. The day commenced with a train ride to Stroud, then a long ascent from the valley made the first part of the carriage excursion a pedestrian effort for the majority of the party, until Lypiatt Manor House was reached. This, though a sixteenth century house, has been so much altered and added to at different periods, and particularly at the beginning of the last century, that picturesqueness and variety of grouping are the main characteristics of the exterior. On the garden side particularly, subsidiary buildings, chapel, dovecote, and flowers make up a piquant composition. Internally the charm of the house is not in its architecture, but in its collection of pictures and bric-a-brac, a collection not so extensive as to be in the foremost rank amongst those of the mansions of England, but such as may be found in many a country house—a Paul Veronese, a Murillo, and so on in variety of selection; representative works of many artists rather than a striking series of any one master. The greatest charm of Lypiatt to the visitor lies rather in the gardens and their arrangement, their connection with and correlation to the house and the remaining buildings—the garden architecture, in fact, and above all the charming views of Cotswold hills and combes amongst which the house is placed. Historically Lypiatt is said to have belonged to the Whitingtons in Plantagenet times, then to the Wyes, and by purchase, in 1610, to Thomas Stephens, a view of whose house and estate by Kip is preserved, and assists one in judging how much of the existing is original. Lypiatt had a small share in the Parliamentary war, being occupied by the Roundheads and taken by the Cavaliers. A cannon shot mark is still shown. Lypiatt is also one of the traditional houses in which the Gunpowder Plot was hatched, but the wide experience of Architectural Association excursionists in country houses leads them to be sceptical about the Gunpowder Plot, the number of places in which it was traditionally concocted bidding fair to run a close second to the sleeping places of good Queen Bess.

From Lypiatt the carriages were accompanied rather than occupied over steep and rough by-roads, with a pause on the way to examine a stone slate quarry, still a going concern, until the midday halt was made at a farmhouse not on the programme, Lower Througham, a charming example of domestic work in the Cotswolds; seventeenth century in date, notable for a stone rain water-pipe with head and shoe complete, but delightful from its grouping of gables and mullioned windows, house and dovecote and its colour of weather-toned rubble, ashlar, and stone slate.

Leaving Lower Througham with pleasurable regret, the pedestrians, slightly assisted by their vehicles, journeyed to Wishanger, where a short stay only was made at the manor house, formerly the home of the Partridge family—a farm inferior in general charm to that last seen, but possessing some detail; fourteenth-century windows of small cusped form, and seventeenth-century porch with eighteenth-century sundial.

Then over hill and dale the party, on their way back to Cirencester, reached Edgeworth, where first of all the church was visited under the guidance of the rector, the Rev. Mr. Shaw, a nephew of Philip Hardwick and John Shaw, and therefore architecturally sympathetic.

The little church at Edgworth, consisting merely of nave and chancel, and south porch with western tower, has many points of interest. The east window is a thirteenth-century uncusped three-light lancet with cusped curtain arch, and below is a single-light small window; also with a "restored" cusped curtain arch. This is conjectured to have been the chancel window of an older building, the floor of which is 2 ft. 9 in. below the present. One window in the chancel—a single light—has a good piece of fourteenth-century glass, which, though not entirely old, has the entire figure of an archbishop, completely vested, with cross, and hand uplifted in benediction. An original stone altar slab is still used for its proper purpose, though carried on modern supports. On the south side are an interesting single sedile and piscina, partly restored from castings of fragments of the original. At the west end are some old pew ends, more quaint than beautiful, which have served as the model for the modern benches.

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The old stairs to the rood-loft remain on the north side, and a modern rood-loft and screen of modern but fairly creditable design has been added to fit them.

After visiting the church the final walk of the day was the inspection of the house, originally built about 1700 by Nat. Ridler, but now just fresh from the hands of Mr. Ernest George, as an example of whose work it was therefore regarded as an example both of what he has added and what he has left. Mr. George has apparently had a free hand, has not been stinted in expense, and the work, therefore, is characteristic. The return to Cirencester was made through Lord Bathurst's famous and extensive park.*

BRITISH ARCHÆOLOGICAL ASSOCIATION:

CONGRESS AT NEWCASTLE-UPON-TYNE.

THE fifty-eighth Congress of the Association was commenced on Thursday, the 18th inst., under the patronage of the Duke of Northumberland, K.G., Dr. Hodgkin, LL.D., F.S.A., being President.

At eleven o'clock the members assembled at the Council Chamber of the Town Hall and were welcomed and formally received by the Mayor and Corporation. After the usual ceremonies, the Corporation plate and insignia, or what remains of them, were inspected. Previous to the establishment of the Reformed Corporation under the Act of 1835 Newcastle was rich in ancient plate and earthenware and other objects of antiquarian value and interest, but in 1836 most of them were sold by auction. Amongst those which remain and were laid out for exhibition were a handsome silver loving cup and salver dated 1681, a mace of the same period, and a seal of James I. One of the most valued treasures now possessed by the Corporation is a finely chased and gold-mounted, two-handed state sword, of the time of Richard II. A description of this sword, by Mr. St. John Hope, F.S.A., was read by Mr. Patrick, hon. Secretary. Newcastle possesses some thirty charters, and three of these, which were produced by the Town Clerk, were of considerable interest. One granted in the sixteenth year of Charles II.'s reign contains a portrait of the monarch, which was contrasted with another portrait of the same monarch upon a second charter granted some twenty years later. The charters are on vellum, and were richly illuminated originally. The Town Clerk explained that as the Corporation was engaged in litigation, no reading of the charters was permissible. After the President, Dr. Hodgkin, had duly acknowledged the Mayor's welcome, a move was made to the Cathedral Church of St. Nicholas, the first place to be visited in the perambulation of the city, to which the remainder of the opening day was devoted, the presidential address being deferred to the evening. Through some misapprehension there was no one present to describe the building. Canon Southwell, however, received the party, and expressed his regret that he, having only just come into residence, was a stranger himself to the history of the church, and was unable to attempt its description. Mr. Thomas Blashill, a V.P. of the Association, thereupon pointed out briefly the more prominent features of the edifice, and sketched in outline its history. The church was consecrated in 1091 by Osmund, Bishop of Salisbury, nephew of the Conqueror; but the original building was destroyed by fire in 1216. The present edifice dates from about the middle of the fourteenth century. A thirteenth century capital enclosed in the wall on the north side internally, and *in situ*, apparently is the only relic left of the earlier church. The nave and choir arches have no capitals, all the work is very plain, but a dignity and repose in the design of the church is agreeable to the eye. The choir is of the second half of the fourteenth century. The famous Lantern Tower crowned with its graceful "steeple" is the great glory of St. Nicholas. There are some six or seven examples in all of this form of steeple, but none are equal to that of Newcastle. It was erected in the middle of the fifteenth century by Robert Rodes, who is said to have been a Prior of Tynemouth, but he is also said to have been a lawyer and a receiver of customs of the Port. When the town was besieged by the Scots in 1644 this beautiful steeple was threatened with destruction by the Earl of Teren, if it did not surrender, but the brave defender, Sir John Marley, was equal to the occasion. He placed the Scotch prisoners in the lantern of the tower and told the Earl that if he destroyed the beautiful structure he would at the same time bathe his hands in the blood of his own countrymen who were placed there on purpose, "either to preserve it from ruin or to die along with it." There are some fine Jacobean monuments to members of the Maddison family and an effigy of a knight, which, from the style of the hauberk and surcoat, Mr. Blashill considered to belong to the early part of the reign of Edward II. It is not known to what family the knight belonged, but Edward II. is recorded to have paid for the funeral services of one Peter-le-Marechal, who was shield-bearer to Edward I., so it is likely this effigy represents that individual. In the Eastern chapel is a fine painting, said to be by Tintoretto, the subject being the "Washing of the Disciples' Feet." In the vestry is preserved a beautifully-written and illuminated Bible, the work of one of the monks of Hexham some 700 years ago.

St. John's Church was next visited, and Mr. Chas. Lynam, F.S.A., pointed out the chief features of the building. A twelfth-century window head in the north wall of the chancel indicates that the church is older than any part of the cathedral, but its actual date is unknown. The tower is at the west end, and is an engaged tower, as at St. Nicholas. The transept aisles are on the west side, and there were no eastern chapels.

After luncheon, the party assembled in the great hall of the castle keep, where Mr. Cadwallader J. Bates told the history and dates from 1172-1177. The members next wended their way to the Black Gate, not far from the castle, wherein are most carefully preserved the fine collection of Roman altars, inscriptions, and other antiquities belonging to the Newcastle Society. The Black Gate is said to derive its name from Patrick Black, who lived in 1617. It was the main entrance to the castle, and is considered to be the work of Henry III. about 1247. Leaving the castle, the party proceeded, under the guidance of Mr. Olive Heslop, one of the Secretaries of the Newcastle Society of Antiquaries, to the Trinity House, noticing on the way the south postern, a bit of the old castle said to be the only remaining Norman postern in England. In the chapel of the Trinity House, which is said to date from 1490, are some good carved bench ends. Mr. Heslop then conducted the party round the west walls, and pointed out the various features. Notwithstanding the destruction which, in the last fifty years, has taken place, owing to the march of modern improvement, Newcastle still retains a considerable portion of its old walls with their towers and gates, and in some parts its embrasures and parapets are intact and in very fair condition. A thunderstorm put an end to the perambulation of the city, and the party returned to the hotel to prepare for the conversazione at the Durham College of Science to which the Congress was invited by Sir Benj. C. Browne and Dr. Hodgkin, and where the President delivered his address, of which we take the following *résumé* from the *Newcastle Daily Leader*:—

Dr. Hodgkin, in the course of his address, welcomed the representatives of the British Archæological Association, and said he had a firm belief in the advantages which learned societies both conferred and received by these itinerating visits to different parts of England. In considering what should be the subject of his address to them that evening, he had thought that a paper entering in detail into some one special subject would not so efficiently serve the purposes of the congress as a more general survey of the history of the county, prepared with some special reference to the scenes to which each day's excursions would conduct them. At the risk of being considered utterly superficial and of insulting a learned audience by the repetition of facts which "every schoolboy knows," he would give a slight outline sketch of the history of Northumberland. He thought they had to confess that, as compared with some other districts of England, they were not rich in pre-historic remains. They had some well-marked British villages or hut circles. They had many barrows, containing evidences of methods of disposing of the dead—both by sepulture and cremation. They had also some remarkably fine specimens of those mysterious cup markings incised on rocks which had aroused so much interest among antiquaries, and which, whatever might have been their purpose—religious, epigraphic, or simply artistic—might, he supposed, be safely stated to be the oldest remains of any kind to be found in Britain. But as they did not propose to make any of these prehistoric monuments the goal of their pilgrimage during the ensuing week, he would not longer dwell upon them, nor invite them to discuss the interesting question whether they were to be assigned to the earliest inhabitants of our island, or rather to their better known Celtic conquerors. For convenience' sake, the year of our Lord 100 should be their starting point, and he would divide the eighteen centuries which had since glided by into six periods of 300 years each, and describe as briefly as he could the leading features of each of these six periods. The Roman period lasted, roughly, from A.D. 100 to A.D. 400. In these three centuries the history of Northumberland was practically the history of the great Roman Wall, and of the Roman roads which ran either along it from sea to sea or across it from the river to the mountains. Dr. Hodgkin then sketched the principal events of the period—the work of the Roman soldiers, the ravages of the Caledonians, and, finally, the Roman exodus. There could be no difficulty, he continued, in deciding which of the excursions arranged for their party best illustrated the period he had thus summarily delineated. On Monday they were invited to visit the two finest camps on the line of the Wall—Chesters, once known as Cilurnum, overlooking the lovely glen of the North Tyne and Housesteads, or Borcovicus, seated on the crest of a high basaltic wave, commanding a wide view of Northumbrian moorlands. The former of these camps they knew to have been garrisoned by a troop of Asturian cavalry from the North of Spain; the latter by a cohort of Tungriens from the country which we now call Belgium. But though the Roman Wall was a military work, and the camps which they would visit were camps and not graceful cities, he prayed them not to let their imaginations repeople them only with scenes of war and bloodshed. In the centuries of Roman dominion there were undoubtedly long intervals of comparative tranquility. So large a force of fighting men—not less than 10,000—with all their camp followers, wives, and children settled on the narrow neck of land between Tyne and Solway, must have exerted a powerful influence on the economic condition of the country. He had sometimes startled visitors by suggesting that the middle region through which the wall runs was far more populous, and possibly more prosperous, in the second century after Christ than it is at the present day. His next period must be called "Chaos, and the Northumbrian Kingdom." For the first century and a-half after the departure of the Romans nothing is known with any certainty as to the history of Northumbria. The pall was partially lifted for us when Ida, the Anglian chieftain, first of Northumbrian kings, builds his wooden burgh on the high basaltic rock of Bamburgh. And yet even then, though they heard something of the succession of kings, and of wars with the Britons of Redesdale, there was for us no history of living interest till the year 617, when Edwin of Deira began his too short, but glorious, reign. Edwin, Oswald, Oswy—these three Christian kings of Northumbria, whose reigns covered the better part of the seventh century (617-670), seemed likely to found a dynasty, which would extend its rule over the whole of Southern Britain. But for some obscure and unexplained events in the eighth century, Bamburgh might have been the London, or at any rate the Windsor, of our island. And if Bamburgh was the Windsor of that great Northumbrian dynasty, Holy Island might fitly be called its Westminster. Having referred to St. Aidan and St. Cuthbert, Dr. Hodgkin said the death of the latter saint brought them to the year 687—very near the end of his second period, but he must be excused a little overlapping, for the kingdom of Northumbria lasted for a century longer, and that closing century, the eighth, though in many ways less glorious than that which preceded it, was illumined by the sanctity and genius of the man who should always be placed in the first rank of English scholars—the Venerable Bede. With what existing edifices did they associate the memory of that great man? The answer at once rose to their lips—With the two churches of Monk-

* To be concluded next week.

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wearmouth and Jarrow. He feared they would see both places grievously changed from that quiet loveliness which they may have worn on a spring morning when Bede thus vibrated between them. "Sweet Jarrow" especially was now overhung with smoke, and resounded to the ringing blows of the sons of Tubal Cain. The chapter of Northumbrian greatness must be considered closed, at latest, in the year 793, when Holy Island was ravaged by the terrible Danish pirate, Ragnar Lodbruk. Dr. Hodgkin next dealt with the subject of the Danish devastations in Northumbria, suggesting that at the present day the ordinary Northumbrian inhabitant was a different being from what he would have been if, during two critical centuries, Northumberland had not been overshadowed by the ghastly-flapping wings of the Danish raven. For after the Danes came the awful wasting of the lands north of the Humber by the order of William the Bastard, and then, at no great interval, the Border wars with Scotland. A people who for so many centuries had much ado to live at all could hardly be expected to develop the arts that adorn life—poetry, music, and painting—like their more fortunate brethren of the South. The world little knows what it may have lost when Holy Island was ravaged by the Danes, and when Jarrow and Monkwearmouth were given to the flames. Proceeding to give briefly the story of the migration of the body of St. Cuthbert until it reached Durham, Dr. Hodgkin said they had now accomplished half of their review, but the remaining three stages would be more rapidly traversed. He had purposely lingered a little over these 900 years in order to remind them and himself of the fact which, to him, though well known, was ever strange and difficult to apprehend, that the Norman Conquest came somewhere more than half-way down in the history of our country—that there was really a longer interval from Julius Agricola to Canute, the Dane, than from Canute to his present Majesty King Edward VII. Let them, then, take their stand at the year 1000, that fateful year which, as men deemed, was to be the end of the world, and see what were the characteristics of the new era upon which they now entered. Though not the end of the world, it was potentially the end of the old order of things in old Saxon England. Ethelred the Unready was now contracting that close alliance with Normandy which caused him to seek a refuge in that land from the victorious Danish King which caused his son Edward the Confessor, son of a Norman mother, to be more Norman than English in heart, and which led by no doubtful chain of causes and effects to the great Norman Conquest of 1066. The Normans came, and whatever other thing they might have left unchanged in our island, they certainly changed the character, as well as enormously increased the number, of its fortresses. He believed it was generally admitted that the pre-Conquest fortresses, the Saxon Burghs, had consisted chiefly of a high mound of earth, surmounted by a wooden palisade, without masonry. The Normans introduced the massive rectangular keep, or its sister, the lighter shell keep. He thought he might term that, their fifth period, the age of castle building, remarking at the same time that here, too, he was not able to avoid a certain overlapping of periods, as the year 1300, which should end his castle building age, marked instead the transition from the old Norman type of the solitary and massive keep to the later concentric type of castle, with barbican, gatehouse, curtain wall, postern, and all the other appliances for combined and converging defence, with which an inspection of almost any fourteenth century castle made them familiar. Now, for that period no excursion could be more instructive than that which they would take the following day, when they would visit, under the most competent guidance, the two great castles of Alnwick and Warkworth, the visible memorials of the greatness of the feudal barons of the house of Percy. But, moreover, the "New Castle" which gave our city its name, and which they had visited that day, erected by Henry II., the nearly contemporary castle of Bamburgh, which, he trusted, they would visit on Tuesday, and the Castle Palace College of Durham, which would be the goal of their pilgrimage on the day following, would, he trusted, be considered by them not unworthy specimens of that triumph of defensive architecture (in the days previous to the introduction of villainous saltpetre), the keep of the masons from Normandy. Of course, while emphasising the military character of most of the Norman remains in our district, he had not altogether forgotten their ecclesiastical glories. To mention the great minster of Durham and the daughter-mother abbey church of Holy Island was to call up the remembrance of some of the noblest and most daring of Norman church builders. His fifth period (1300 to 1600) he would call the period of the Border wars. And here, at last, they came to a time in which there was none of what he had called overlapping. In 1292 John Baliol did homage to Edward I. for the crown of Scotland. By 1296 the lord had goaded his new vassal by countless insolences into rebellion. By 1305 a part of the dismembered body of the patriot Wallace was displayed at Newcastle-on-Tyne. Scotland was changed, happily not for ever, from a friendly neighbour into a bitter and vindictive enemy. The era of the Border warfare, with all its romance and all its misery, with all its deeds of heroism and all its squalid lawlessness, with its ballads, its poverty, its sharpening up of international dislikes, jealousies, contempts, this strange wild archaic era had begun, and was to endure for three centuries, till it was ended in the springtide of 1603 by that auspicious journey by which James Stuart of Scotland, great grandson of Henry VII. of England, crossed the Border amid the acclamations of his new as well as of his old subjects. It was on April 9 that he entered our town, when the mayor and aldermen knelt before him and presented him with that pleasantest of all testimonials, a purse of gold, the tradesmen and their apprentices, the flatcaps rending the air meanwhile with such vociferous huzzas that James, with unwonted modesty, whispered to one of his Scottish lords, "By ma soul, these men are eneuch to spoil a guid King." He (the speaker) had now brought his hearers to the happy ending of these three centuries of feud, but he asked them to think what they must have meant practically to the daily life of the dwellers in Northumberland and the sister county of Cumberland. Not as it was to the rest of England, one great, solemn military expedition every ten or twenty years, with its chances of glory or plunder to be won on the other side of the Tweed, but one unceasing, monotonous story of raids and petty plunderings; for the herdsman no certainty that ere nightfall the "raiders" would not appear in his valley and drive off the best of his cattle; for the townsman the irksome duty of mounting guard on the town walls, the occasional agony of seeing his dwelling wrapped in flames and the accumulations of a lifetime destroyed by the ravages of the Scots. To illustrate the romantic, but unhappy, Border time, the secretaries had arranged an excursion for the 25th inst., when he hoped to have the honour of conducting them over the ever-memorable battlefield of Flodden. And now, for the last three hundred years (1600-1900) what could they call them but, notwithstanding some interruptions from civil war and from two soon-suppressed rebellions, on the whole an era of peace and prosperity. For them he could only use the hackneyed quotation, "Si monumentum quaeris circumspice." The wilderness of houses in the midst of which they met, the bridges, the factories, the ironfoundries, the long lines of dull streets, lined with grim classical architecture, the smoke, the clangour, the Central Railway station — that maelstrom of man — all or nearly all of this busy world has sprung into existence since the Mayor of Newcastle-on-Tyne kneeled to James Stuart, and to most of these there is no corresponding ray in the archæological spectrum. Only, since the beginnings of all mighty changes should have an interest at any rate for the historian, he would ask them when on Monday they were travelling westward by the Newcastle and Carlisle railway to get their guide to point out to them a little inconspicuous house on the north bank of the Tyne between Ryton and Wylam. There lived for some years, and not far from it was born, the man who, by a simple mechanical invention, had revolutionised both worlds, that of commerce and that of war, the only man, he thought they might say, who had been the cause of such changes in the surface of our globe, as with telescopes such as we possess, might be seen from the nearest planet —the inventor of the locomotive, George Stephenson. He (Dr. Hodgkin) would gladly have described to them at some length what archæology had achieved and suffered during that most changeful period, how some of our most interesting monuments had fallen victims to what was called architectural or industrial "improvement," and how, on the other hand, a noble succession of students — Horsley, Hodgson, Bruce, and their living successors (whom he named not, though he trusted they would soon make their personal acquaintance) —had carried on the work of Camden and of Cotton. In conclusion, he expressed the hope that the arrangements for the survey of the county might be successfully carried out, and that their visit to Northumberland might be in the retrospect not the least agreeable, nor the least interesting, of the memoirs of the Archæological Association.

BUILDERS' BENEVOLENT INSTITUTION:

ANNUAL MEETING.

THE fifty-fourth annual meeting of the Builders' Benevolent Institution was held on Thursday, July 18, at the offices, 35, Southampton-row, Bloomsbury, W.C. Mr. J. T. Bolding presided, supported by Messrs. C. Bussell, E. V. New, Thos. Stirling, T. Stirling, jun., J. Carmichael, and other friends of the charity.

The Secretary (Major R. A. Brutton) read the Annual Report, which stated that when the unprecedented pressure of the times upon all classes of society was remembered, and how the great charities of the Metropolis had suffered, it was a subject of congratulation that this Institution had not been more seriously affected. At the same time, the falling-off had been chiefly in the annual subscriptions, which must always be the mainstay of the charity. It was, therefore, hoped that those gentlemen who already subscribed would use their influence with any friends who had not done so. The Institution owed a debt of gratitude to the President, Mr. John Greenwood, C.C., for his efforts in making the Annual Dinner such a financial success. The Committee had again been able to elect all the eligible candidates this year, and it was a source of thankfulness that the members seeking election had not been sufficiently numerous to entail the necessity of a contested election. It was, however, expected that the number of applicants would be greater in the future, in consequence of Rule III., Section I., altering the age of candidates from sixty to fifty-five, having been sanctioned at the last general meeting. Only three deaths amongst the pensioners had occurred during the year, all of whom were men; while five pensioners had been elected. The annual dinner would be held at the Carpenters' Hall, on Thursday, November 14 next, when Mr. James Carmichael, of Wandsworth, who had consented to be President, would be in the chair.

Mr. Thomas Stirling moved the adoption of the report and accounts, adding, that so long as they were on the right side, and elected all the applicants, he believed the subscribers would be well satisfied.

Mr. New seconded the motion, which was unanimously agreed to.

Mr. C. Bussell proposed a cordial vote of thanks to the retiring president, Mr. John Greenwood, for the valuable services rendered to the charity during his year of office. It must be a satisfaction to Mr. Greenwood to leave the Institution in a somewhat better position than when he took office, and he would move that he be requested to become a member of the Committee.

Mr. T. Stirling seconded the motion, which was carried by acclamation.

Votes of thanks were also passed to the Vice-Presidents, the Trustees, the Treasurer (Mr. J. Howard Colls), the Committee (the retiring members being re-elected), and to the hon. auditors (Messrs. J. T. Bolding and R. J. Ward).

The Chairman next proposed the election of Mr. James Carmichael as President, and congratulated the meeting on being able to get so well-known a man connected with the building trade to take the post.

Mr. Stirling seconded the resolution, which was agreed to *nem. con.*

Mr. Carmichael replied, and announced his determination to do his utmost for the Institution.

A vote of thanks to the Chairman closed the proceedings.

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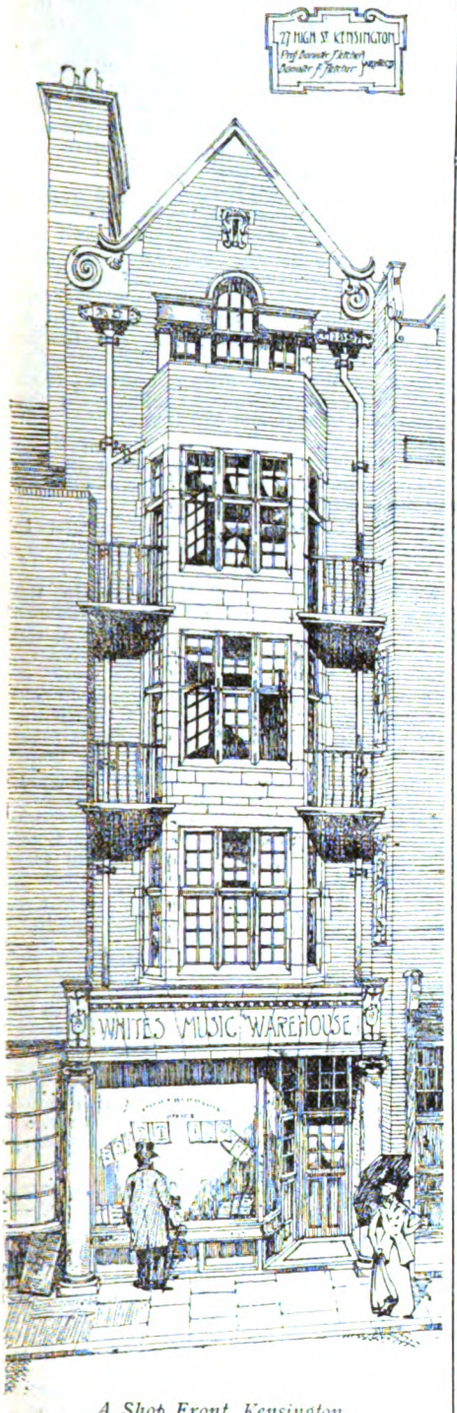
A SHOP FRONT, KENSINGTON.

THESE premises, forming No. 27, High-street, Kensington, have recently been erected, and consist of a music shop and practising-rooms on the ground floor, the upper floors being occupied as flats.

The front has its boundaries recessed in the upper portion, and a bay window taken up for three stories, thus forming a balcony on either side. The return walls have been treated with



A Shop Front, Kensington.

glazed tile panels representing famous musicians, by which means a certain amount of colour and interest is given to the façade.

The materials used are Lawrence's red bricks and Kedon stone, and steel casements fitted with leaded lights for glazing. The builder was Mr. A. H. Bird, and the works were designed and carried out under the superintendence of the architects, Messrs. Banister Fletcher & Sons.

PALESTINE EXPLORATION FUND.—At the recent annual meeting of the Fund, Mr. J. D. Crace was unanimously elected Hon. Secretary *vice* the late Sir Walter Besant. Dr. Bliss and Mr. MacAlister are preparing a detailed and illustrated description of their excavating work at Tell-es-Safi and in the vicinity, to form a companion volume of the "Memoirs" of the survey of Western Palestine. It is anticipated that the Sublime Porte will grant a renewed firman for the continuance of operations at Tell-es-Safi

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MIDLAND Counties district meeting of the members of the Association of Municipal and County Engineers was held at Swadlincote on Saturday, July 20. On arrival at the Council chambers from Church Gresley Station the members were received and welcomed by the Chairman and other members of the Council. The President (Mr. E. G. Mawbey, C.E., of Leicester) presided, and amongst those present were Messrs. J. Price (Birmingham), C. F. Wike (Sheffield), G. Hodson (Loughborough), W. T. Creswell (Weedon), T. W. A. Hayward (Sudbury), G. F. Lynam (Burton-on-Trent), S. S. Platt (Rochdale), P. O. Fell (Norwich), A. D. Greatorex (West Bromwich), J. T. Eayrs (Birmingham), and others.

Mr. J. H. Stevens, Chairman of the District Council, offered the members a hearty welcome to what he described as practically a new district.

The President, having acknowledged the welcome accorded to the Association, moved a vote of sympathy with the three members of the Association — Messrs. J. S. Pickering (Nuneaton), F. S. Yates (Waterloo), and Coates (Market Harborough)—in the motor accident they met with at Leicester, with sincere wishes for their recovery.

Mr. T. Kidd, A.M.Inst.C.E., surveyor and waterworks engineer, read a paper on the "Public Works of Swadlincote." He said that to-day Swadlincote was looked upon as the largest sanitary-pipe producing district in the world, and that day they would have the pleasure of visiting one or two of these typical works through the kindness of Messrs. J. Woodward, Limited, and Messrs. T. Wragg & Sons, Limited, who had consented to keep open their works so that the members present might have an opportunity of witnessing the actual manufacture of the appliances now so common to municipal and sanitary engineers. There were also splendid seams of fireclay from which the large Sheffield steel and iron firms were supplied with firebricks, which spoke as to the quality of these for withstanding intense heats. The finer kinds of crucible clay were mixed similarly to coal and were in great request by steel-smelters, both in England and abroad, and had even been purchased by the progressive Japanese. A later industry was the manufacture of glazed bricks. Swadlincote had a large export trade with France, Germany, Belgium, and other Continental countries, also with India, Africa, South America, Australia, and elsewhere. The district, considering the nature of the employment, might be looked upon as healthy, the death-rate for 1900 being 14·46 per thousand. The population, which was 4,094 in 1851, was 18,014 in 1901. The main sewerage system was designed and carried out by the late Mr. Marshall at a cost, including the purchase of land, of 30,770*l*. The ventilation of the sewers by open gratings at the street level had been in many instances a source of constant complaint owing to the stench, therefore a system of ventilation by means of cast-iron shafts with air inlets had been adopted and, where carried out, had given every satisfaction. The sewage was delivered by gravitation on to the sewage farm, 64 acres in extent, laid out in beds with distributing carriers and chambers, and was underdrained 5 ft. to 6 ft. deep, by 9-in. pipes laid herring-bone, 66 ft. apart; the crops grown thereon being rye grass, oziers, mangolds, turnips, carrots, cabbages, celery, potatoes, &c., part of the produce being consumed on the farm and the remainder sold. The cost of working the farm for the year ended March, 1900, including rates and taxes, was 578*l*. 7s. 10d., and the receipts for produce sold 557*l*. 9s. 2d., leaving a balance of 20*l*. 18s. 8d. to be provided by the rates. The water supply was derived from the Milton Watershed, and after being pumped into Woodville reservoir gravitated into the district, the consumption being equal to an average of about 10 gallons per head per day. The gasworks were purchased by the Urban District Council, the cost, with extensions, being 47,833*l*. 19s. 11d. In the making up of private streets the Council had in every case assisted the property owners where the streets had been in existence any length of time and built up, by paying the whole cost of storm-water sewers, gullies, branch drains, street lighting, &c. The average amount charged to the owners had been about 20s. per yard lineal on a 30-ft. street. The joint waterworks at Milton were designed by Messrs. G. & F. W. Hodson to supply a population of 27,000 persons at 20 gallons per head per day; the hardness of the deep-seated water being 20·12 deg. before boiling and 6·64 deg. after, while the water from the upper gravels was only 15·89 deg. before boiling and 4·69 deg. after. In order to reduce the hardness it was decided to adopt the Archbutt-Deeley softening process, the hardness being principally due to carbonates and not to the sulphate of lime. The works for abstracting the water were of the simplest nature, and consisted of a series of Abyssinian tube wells distributed over the site in such a manner as to intercept the upland water, and of the construction of filter tunnels through the adjoining lands. The well was 20 ft. internal diameter, and was sunk through the gravel, which was 23 ft. in thickness, down to the red marl. Filter tunnels were constructed and formed by excavating close-timbered trenches down to the marl, and all undulations were cut through so as to allow a true gradient of 1 in 300 throughout. The water, after being treated and softened, was pumped through a 12-in. rising main to the Woodville reservoir. Two sets of 9½ in. by 15 in. treble ram pumps were provided, and when working together were capable of delivering 45,000 gallons per hour to a vertical height of 420 ft. through the rising main. Since the works were brought into full operation the water had undergone a change, the hardness being now not less than 26 deg., and besides being very hard contained in solution a certain amount of iron, which precipitated on exposure of the water to light and air. The iron was successfully and completely removed, and the hardness of the water reduced from 26 deg to an average of 9 deg. The mechanical operations involved with the softening and purification of hard water by the Archbutt-Deeley process included the preparation of the reagent, the mixing of it with the hard water, the separation of the precipitate, and the subsequent bicarbonating of the softened water. The apparatus and process employed were of the simplest possible character compatible with efficiency, and were applicable to the removal of both temporary and permanent hardness. The precipitate, by lying at the bottom of the tank, became segregated into coarse flakes, which, when stirred up and allowed to settle again, carried down the fine particles of fresh precipitate so rapidly that in less than thirty-five minutes the water cleared itself to such an extent that the suspended matter remaining, even at a depth of 6 ft. from the surface, did not exceed 1 grain per gallon. The apparatus was designed to treat 45,000 gallons per hour, which was easily softened and purified in four tanks 10 ft. 6 in. deep, each having a working capacity of 27,000 gallons, being three-fourths of its depth, about 2 ft. 6 in. of water and mud being allowed to remain when the water was drawn off, while a margin of 6 in. at the top was left in filling, which was done by means of a supply-pipe from the hard-water tank. The reservoir, which had a capacity of over one million gallons, was situate to the north-east of Woodville, at an elevation of 550 ft. above O.D. The total cost of the works was 30,502*l*. 9s.

Mr. J. Price, Birmingham, moved a vote of thanks to Mr. Kidd for his paper. It referred to a district which had been nicely progressive—no great jump, but still steadily increasing in population. It was evident the District Council, since the amalgamation, had been successful—at any rate the death rate seemed to show that, because in 1894 they had a death-rate of 17·57, and in 1900 it had dropped to 14·46, which pointed to useful sanitary work. That the District Council had not been behindhand in facing expenditure they could see by the spending of 30,000*l*. on sewerage and sewage disposal—work which came out at 2*l*. per head of the population, which was considered rather heavy. On looking through the tabulated statement of the gasworks they could not help noticing the very large apparent leakage, equal to 23 per cent. of the make, if he read the figures correctly.

Mr. C. F. Wike, Sheffield, who seconded, said, with respect to Urivale-street works, he had experienced great difficulty in Sheffield with the dedication of streets. He had eighty miles of undedicated streets, and they had proposed almost every kind of construction to meet the owners who had to pay the cost.

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But whatever kind of construction they adopted it was always unsatisfactory unless it was done for nothing. They had made rebates to owners, with the result that they were running close to being the highest rated town in England.

Mr. J. T. Eayrs, Birmingham, also called attention to the enormous amount of gas unaccounted for. He remembered when he was a public officer the leakage at West Bromwich was between 6 and 7 per cent., and that was a mining district which might fairly be compared with Swadlincote.

Mr. A. D. Greatorex, West Bromwich, said the recent report of the Gas Committee showed a loss from leakage of 4·36 per cent. For the loss at Swadlincote there must be some reason, and it would pay the Council to find it out and remedy it.

Mr. S. S. Platt, Rochdale, said as to the price of sewerage and sewage disposal he thought the Council ought not to consider the price excessive; 2*l.* per head was not excessive when dealing with a small population. He congratulated Mr. Kidd upon the good results of the sewage farm, for to work the farm and get a good effluent with a loss of only 20*l.* a year was doing very well indeed.

Mr. Lynam, Burton-on-Trent, expressed his surprise at the small cost of construction of streets and the small quantity of water consumed per head of the population.

The President having closed the discussion, a hearty vote of thanks was accorded to Mr. Kidd for his paper.

Mr. Kidd, on replying, said the county medical officer (Dr. Barwise) had said the effluent from the Swadlincote sewage farm was the best in the county of Derby. With respect to the cost of private street works, they had all the underbedding given them and had only to cart it. With reference to the loss of gas, the district was subject to mining operations and in one part was really pulled to pieces, which was the reason for the loss of 23 per cent.

The members then visited the sanitary and glazed brickworks of Messrs. James Woodward, Limited, and the sanitary pipeworks and claypits of Messrs. T. Wragg & Sons, Limited, and were afforded an opportunity of seeing all the process of manufacture of the various productions of both firms. They then drove in brakes to Bretby Park, the residence of the Earl of Carnarvon, where they were entertained by the two firms previously mentioned to luncheon in the park. Mr. T. Wragg presided, and after luncheon several toasts were honoured. Following the luncheon the members visited the pumping station and witnessed the process of softening the water by the Archbutt-Deeley process. The meeting was in every respect a most successful one.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Fulham Borough Council 5,875*l.* for acquisition of and laying-out Pryors Bank as an open space; Hackney Borough Council, 8,000*l.* for the purchase of land for an electric lighting station and destructor, and 34,200*l.* for electric light installation and dust destructor; Hammersmith Borough Council, 1,900*l.* for the purchase of electric light meters; Kensington Borough Council, 16,440*l.* for contribution to street improvement; Lambeth Borough Council, 10,800*l.* for paving works; Poplar Borough Council, 5,980*l.* for paving and channelling works; Southwark Borough Council, 20,990*l.* for paving works; Stepney Borough Council, 12,000*l.* for the purchase of a wharf; Woolwich Borough Council, 20,000*l.* and 27,805*l.* for electric light works, street lighting, and meters; Battersea Borough Council, 7,860*l.* for street improvement; Hampstead Borough Council 9,623*l.* for electric light installation; Islington Borough Council, 2,500*l.* for the same purpose, and 2,018*l.* for the purchase of electric light meters; and Lambeth Borough Council, 2,348*l.* for paving works.

The Chief Engineer.—It was decided to advertise for a new chief engineer at a salary of 2,000*l.* to fill the vacancy caused by the resignation of Sir Alexander Binnie.

Tramways.—The Highways Committee reported that difficulties had arisen in regard to the projected generating station at Camberwell, for the purposes of which it had been intended to acquire property at a cost of 80,000*l.* They therefore recommended an alternative scheme at Greenwich which would involve only 30,000*l.* cost as to land, but in regard to which there was the disadvantage of distance from the centre of the tramways system and consequent leakage of current.

It was agreed to apply for Parliamentary powers next session to acquire compulsorily the land required at Greenwich.

The meeting was made special for the consideration of resolutions to acquire compulsorily certain portions of the tramways owned by the South London Tramways Company at Wandsworth and Battersea, and by the Woolwich and South-East London Tramways Company at Woolwich and Plumstead.

The purchase resolutions were adopted without discussion.

The Tooting Housing Scheme.—The Housing of the Working Classes Committee recommended a vote of 30,000*l.* for paving and sewer works on the Totterdown Fields Estate, Tooting, which is in course of laying out for the erection of industrial dwellings.

The recommendation was agreed to.

The Widening of Piccadilly.—In connexion with the proposed widening of Piccadilly between Hyde Park Corner and Walsingham House, the Improvements Committee brought up a report and the following recommendation:—"That the working drawings, specification, and estimate of the cost—29,400*l.*—of the paving and other works connected with the widening of Piccadilly between Hyde Park Corner and Walsingham House, by the addition to the public way of the strip of the Green Park in question, be referred to the Manager of the Works Department, with a view to the work being carried out without the intervention of a contractor."

Mr. W. H. Dickinson said the widening proposed would not do away with the traffic difficulties, and he moved, as an amendment, to preface the recommendation by the following words:—"Provided that the plans be so amended as to provide for the retention of the greater number of the trees at present proposed to be cut down." He pointed out that the cutting down of trees was a serious matter, and he suggested that the trees might be left standing in the road.

Lord Monkswell seconded the amendment, and said every effort ought to be made to get the Government to retain the trees.

On a division there was a tie, 56 for and 56 against the amendment, and the Chairman declared the amendment not carried.

On the motion of Mr. Cornwall, it was agreed that the Improvements Committee again confer with the Office of Works, with a view to saving more of the trees than now contemplated.—As thus amended, the recommendation was agreed to.

Strand Widening.—The Improvements Committee recommended that the Council should vote 50,000*l.* towards the cost of widening a portion of the Strand to 80 ft. at Nos. 89, 90, and 94, to 104, east of the Hotel Cecil, which was proposed to be carried out by the Westminster City Council. The Committee reported that it might be possible at an early date to deal with three other properties.

The recommendation was agreed to.

The View from Richmond Hill.—Replying to Mr. Burns, M.P., Lord Monkswell said he had received a letter on behalf of the owners of the Richmond Hill property, offering to sell the property in question to the Council for 70,000*l.* The conditions attached to the offer were that a deposit of 3,500*l.* should be paid down on the signing of a formal contract, which should be forfeited if the Council did not complete the purchase by December 31 next. The balance of the purchase money was to bear interest at the rate of 4 per cent. The owners, on their part, agreed to stop all development work until December 31. That letter would be considered by the Parks Committee on Friday.

New Technical Institutions.—The following recommendations of the Technical Education Board were agreed to:—

(*a*) That the plans, specifications, and quantities in respect of the Poplar Technical Institute be approved; that, in the event of the manager of the Works Department being prepared to carry out the work in connexion with the buildings at the amount of the architect's estimate, the Technical Education Board be authorised to refer the same to him, and that in the event of his not being so prepared the Board be authorised to invite tenders for the work.

(*b*) That the plans, specifications, and quantities in respect of the Brixton Technical Institute be approved; that, in the event of the manager of the Works Department being prepared to carry out the work in connexion with the buildings at the amount of the architect's estimate, the Technical Education Board be authorised to refer the same to him, and that in the event of his not being so prepared the Board be authorised to invite tenders for the work.

Hampstead Fire Station.—The Fire Brigade Committee recommended, and it was agreed, that the estimate of 1,736*l.* submitted by the Finance Committee be approved; that the Council do sanction an expenditure of 1,620*l.* for adapting for the use of the brigade the premises erected on plot 45, Holly-hill, Hampstead; that the work be executed by the Council without the intervention of a contractor; and that the drawings, quantities, specification, and estimate be referred to the manager of works for that purpose.

Shallow Underground Tramways.—A report was submitted by the Highways Committee to the effect that the electrical engineer and the tramways manager be authorised to visit America at the expense of the Council, to inquire into the system of shallow underground tramways, and also as to the latest system of tramway traction in America. The matter arose in connexion with the suggestion to make a shallow underground tramway from Westminster to Finsbury-pavement, *via* the Strand, Fleet-street, and Cheapside.

Replying to Captain Swinton, Mr. Benn said the officers could pay attention to the developments in motor-cars in America if they had the opportunity.

Victoria Embankment.—It was agreed to expend 5,660*l.* for remetalling the carriageway of Victoria Embankment.

Rebuilding No. 17, Fleet-street.—On the recommendation of the Historical Records and Buildings Committee it was agreed that the work of rebuilding the rear portion of No. 17, Fleet-street, and of executing such works as may be required to the front portion, be carried out without the intervention of a contractor, and be entrusted to the Works Department upon the basis of the Department being allowed the prime cost plus the usual percentage for use and waste of plant and establishment charges, and in addition, at the discretion of the Historical Records and Buildings Committee, a further allowance to represent contractor's profit.

Holborn to Strand.—The Improvements Committee recommended, and it was agreed—

(*a*) That the working drawings, specification, and estimate of the cost (28,000*l.*) of the paving and other works in connexion with the widening of the Strand between Catherine-street and a point to the west of St. Clement Danes Church, be referred to the manager of the Works department, with a view to the work being carried out without the intervention of a contractor.

(*b*) That the Improvements Committee be authorised to engage at the weekly wages of 3*l.* 13*s.* 6*d.* a clerk of works in connection with the widening of the Strand.

Old-street and Goswell-road.—The same Committee recommended and it was agreed—

(*a*) That the working drawings, specification, and estimate of the cost (8,520*l.*) of the paving and other works in connexion with the Old-street and Goswell-road improvement be referred to the manager of the Works department, with a view to the work being carried out without the intervention of a contractor, it being understood that the works will be proceeded with by night as well as by day.

(*b*) That the Improvements Committee be authorised to engage at the weekly wages of 3*l.* 13*s.* 6*d.* a clerk of the works in connexion with the Old-street and Goswell-road improvement.

Tenders.—The following tenders were accepted:—

Grease separator at Crossness outfall: Messrs. W. B. Haigh & Co., 105*l.* Repair of delivery trough, Deptford Pumping Station: Messrs. Fletcher, Son, & Fearnall, 1138*l.* Tar paving materials, Plumstead Common: B. S. Jones, bottoming, 19*s.* per ton; topping, 1*l.* 2*s.* 6*d.* per ton; dust, 19*s.* per ton; and spar 1*l.* 10*s.* per ton.

Having transacted other business, he Council adjourned.

BRITISH MEDICAL ASSOCIATION.—For the sixty-ninth annual meeting of the British Medical Association, which will be opened at Cheltenham on Tuesday next, Mr. J. Hall, A.M.Inst.C.E., has made plans for the renovation, at a cost of 10,000*l.*, of the Winter Garden, in which the annual exhibition and museum will be held.

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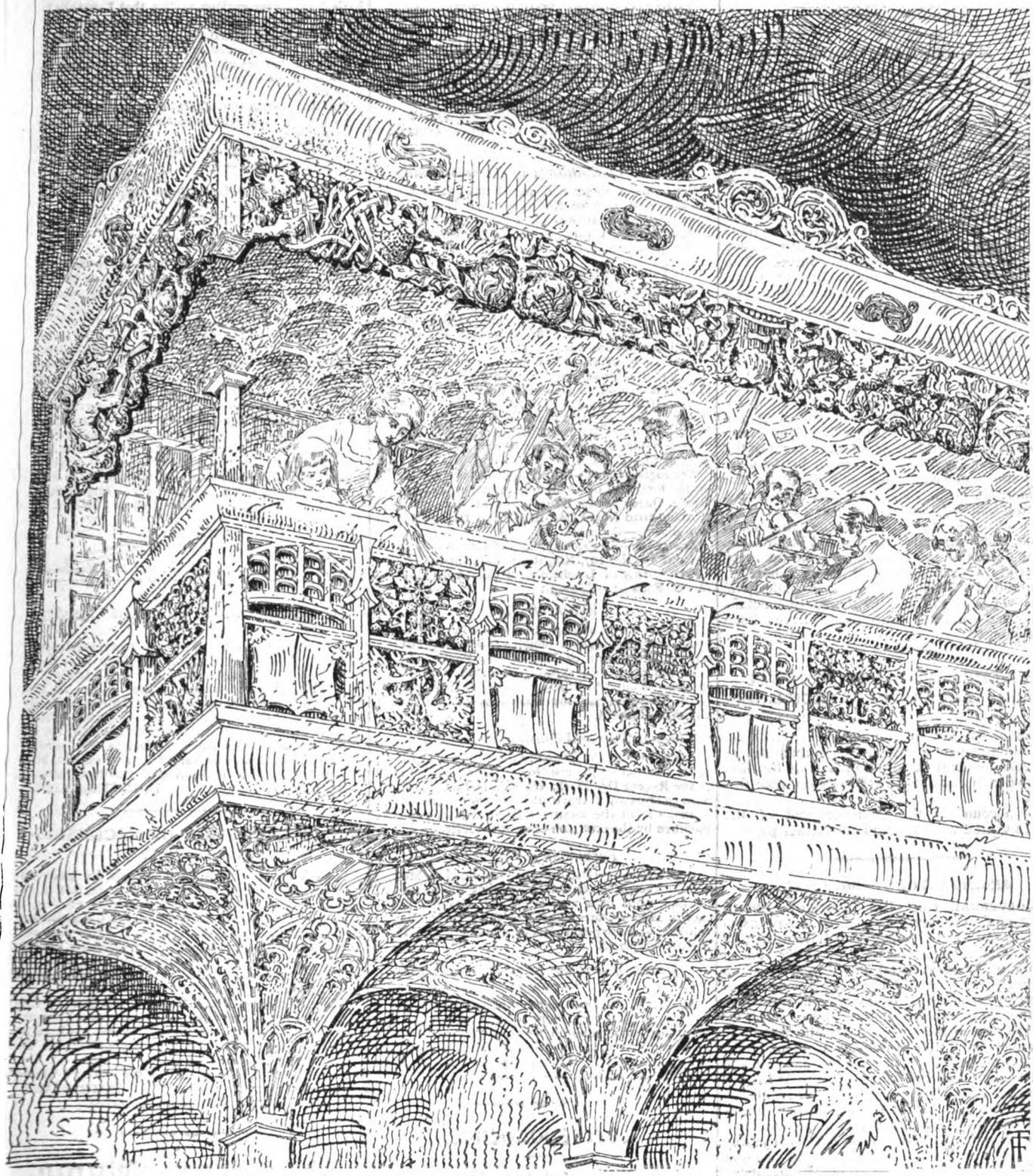

Musicians' Gallery, Adel Towers, Leeds. Messrs. Bromet & Thorman, Architects.

MUSICIANS' GALLERY, ADEL TOWERS, LEEDS.

THE Musicians' Gallery, here illustrated, formed part of some alterations and additions recently carried out at Adel Towers. It is constructed entirely of pencil-cedar, to correspond with the remainder of the woodwork in the house. Mr. Ralph Hedley, of Newcastle-on-Tyne, was the carver. Messrs. Bromet & Thorman, of Tadcaster and Leeds, are the architects.

A NEW DOCK (PORT OF LONDON).—Lord Morley's Committee of the House of Lords have ordered to be reported to the House for third reading the Bill promoted by the London and India Docks Company. The measure, which has passed the House of Commons, will confer powers for raising further capital to the extent of 2,000,000*l.*, with the usual power to borrow a third as much more, for the construction of a large new dock at West Ham in view of the rapid growth of trade in the Port of London.

COMPETITIONS.

NEW BATHS AND WASH-HOUSES, OLD KENT-ROAD.—Mr. A. Saxon Snell has been appointed assessor in the competition in respect of designs for the Public Baths and Wash-houses which the Camberwell Borough Council propose to build upon a site in Old Kent-road.

SCHOOL, RANMOOR, YORKSHIRE.—The Building Committee of the Sheffield School Board, having received a report from Mr. Robson respecting the seven sets of competitive plans for a school at Ranmoor, recommended:—"That the plans submitted by Messrs. Holmes & Watson be accepted and adopted for the above-named school, subject to the conditions set forth in the instructions for the guidance of architects and to any modifications which may be deemed necessary, subject also to the approval of the Board of Education. That premiums of 15*l.* each be awarded to Mr. H. I. Potter and Messrs. Hemsoll & Paterson, whose plans are adjudged to stand second and third in the order of merit." Plans submitted by Messrs. Holmes & Watson for the erection of a senior mixed department in connexion with Tinsley Park-road school, to accommodate 750 children, have been adopted.

BOOKS RECEIVED.

THE PARISH CHURCHES OF NORTHAMPTONSHIRE, illustrated by wills, *temp.* Henry VIII. By the Rev. J. Charles Cox, LL.D., F.S.A. (Harrison & Sons.)

THE LATER RENAISSANCE IN ENGLAND. By John Belcher, A.R.A., and Mervyn E. Macartney. (B. T. Batsford.)

THE ROYAL TOMBS OF THE EARLIEST DYNASTIES. Part II. By W. M. Flinders Petrie. (Egypt Exploration Fund.)

DIOSPOLIS PARVA. By W. M. Flinders Petrie. (Egypt Exploration Fund.)

CATALOGUE OF PRINTED BOOKS ON HERALDRY, in the National Art Library, Victoria and Albert Museum. 2*s.* (Eyre & Spottiswoode.)

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Illustrations.

MALMESBURY ABBEY.

ALTHOUGH the foundation of the abbey at Malmesbury is said to date from the time of Aldhelm, in the seventh century, nothing in the existing part of the Benedictine church is older than the Norman period. Much of it is Transitional in character, and the clearstory and some other details are of Decorated work of the fourteenth century. The presbytery and the two towers (western and central), the north transept, and the monastic buildings on the north side have disappeared. Of the nave of nine bays, six are vaulted, and form the parish church. The remaining three are more or less in ruins. There are fine Norman doorways on the south and west (the latter a mere fragment), some curious Decorated window tracery in the south aisle, and the lower part of the "pulpitum" or rood-screen, now against the present east wall under the western arch of the "crossing." Three out of the four piers that supported the central tower are still standing, with the north and west arches of the "crossing," and the west wall of the south transept to a considerable height. Most of the features already noted are shown in the view from the south-west now published. In the *Builder*, March 2, 1895, a ground plan of the existing building was given; also a view from the south side, the nave arcade, the south porch, and a descriptive article and illustrations of the details of the rood screen, and the tomb generally known as that of King Athelstan. The abbey church has recently undergone some repair, and many of its external details that had become dangerous have been strengthened.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

THESE sketches, made especially for this occasion by Mr. W. Curtis Green, illustrate some of the places visited by the members of the Architectural Association during the first days of their excursion in Gloucestershire this week.

An account of the excursion and of the places visited will be found on another page.

ARCHITECTURAL SOCIETIES.

WOLVERHAMPTON AND DISTRICT ARCHITECTURAL ASSOCIATION.—This is a new association, just formed under the above title, with the following objects as stated under Rule 2 in its prospectus:—"(a) The fostering of a feeling of brotherhood and mutual respect and intercourse between local qualified architects. (b) the consideration of any matter affecting the interests of the profession in the town and neighbourhood; (c) to endeavour to maintain the established code of professional practice and charges as laid down by the R.I.B.A." The Association is to consist of Members, Associates, and Honorary Members. Members being duly qualified architects who have been in actual practice for at least two years; Associates, shall be architects who are not eligible as Members; and Honorary Members, who shall be gentlemen eminent for distinguished attainments, or who have rendered special services to the Association or profession. The entrance fee for Members and Associates is to be one guinea, payable on election, and the annual subscription for Members, 15s.; and for Associates, 10s. 6d. The following is the list of officers:—President—Mr. J. Lavender, F.R.I.B.A.; Vice-President—Mr. G. H. Stanger, F.R.I.B.A.; Council—Messrs. F. Hunter Lynes, A.R.I.B.A., T. H. Fleeming, and S. H. Eachus (London); Hon. Treasurer—Mr. J. Harrison Weller; and Hon. Secretary—Mr. W. Edwards (25, Darlington-street, Wolverhampton).

THE ROYAL ACADEMY SOIREE.—The annual soirée of the Royal Academy was held on Wednesday evening at the galleries at Burlington House at 9 p.m. Ehe guests were received at the entry to the octagon room by the President, Sir E. J. Poynter. There was the usual large attendance of people of artistic and social eminence, and the whole entertainment was much as usual. The Royal Artillery band played beautifully, in the Lecture-room, during the greater part of the evening, and conversation, the pictures, and the refreshments furnished the remainder of the evening's amusement.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Erection of Buildings in Norwood-road.

Norwood.—A public hall, and houses with shops, on the west side of Norwood-road, Norwood, to abut also upon York-road, Ullswater-street, and Harpenden-street (Mr. J. S. Quilter for the freeholders).—Consent.

Lines of Frontage, and Projections.

Bermondsey.—A building, to be used as a girls' school, on the north side of New Kent-road, Southwark, next Buckenham-square (Mr. W. C. Jones for the Governors of St. Saviour's and St. Olave's Foundation).—Consent.

Kensington, North.—A bay window in front of No. 79, Ladbroke-road, Notting Hill (Messrs. Hukins & Mayell for Colonel Fanshawe).—Consent.

Bow and Bromley.—A covered way over the stairs leading to the northern platform at the Wellington-road Station, Bow-road, Bow (Mr. C. A. Brereton for the Whitechapel and Bow Railway Company).—Consent.

Kensington, North.—Buildings, to be used as shops, on the forecourt of a building known as the Norland Castle, Queen's-road, Kensington, at the corner of Norland-road North (Mr. A. Gordon for the Salvation Army).—Consent.

Lewisham.—The enlargement of two bay windows in front of No. 107, Ringstead-road, Rushey-green, at the corner of Laleham-road (Mr. A. L. Guy for Mr. C. Fookes).—Consent.

Width of Way.

Poplar.—Two buildings, to be used as a doctor's house and dwellings for female officers respectively, on the south side of High-street, Poplar, at less than the prescribed distance from the centre of a roadway leading to Poplar workhouse (Messrs. J. & S. F. Clarkson for the Guardians of the Poplar Union).—Consent.

Width of Way and Construction of Building.

Poplar.—That the Council's resolution of April 30, 1901, sanctioning the erection of an open iron shed at the Regent Dry Dock, West Ferry-road, Millwall, with the forecourt fence at less than the prescribed distance from the centre of Regent Dock-road, be modified by the omission of words.—Agreed.

Formation of Streets.

Wandsworth.—That an order be issued to Messrs. Farebrother, Ellis, & Co., sanctioning the formation or laying-out of a new street for carriage traffic on the Mount Clare Estate, to lead from Roehampton-lane to Priory-lane, Roehampton (for Mr. H. C. Smith).—Consent.

Means of Escape from Top of High Buildings.

St. George, Hanover-square.—Means of escape in case of fire on the top story of the southern portion of a block of residential flats on the west side of Harewood-place, on the site of No. 14, Hanover-square, St. George, Hanover-square (Mr. P. Hoffman, for Mr. H. Lovatt).—Refused.

Correspondence.

To the Editor of THE BUILDER.

PORTLAND CEMENT TESTING.

SIR,—I considered the article on "Portland Cement Testing," in your issue of 13th inst., very interesting. I agree that a very large number of engineers, architects, and surveyors would get very much better results, and often prevent unnecessary expense and trouble, if they made it a rule to have the cement tested.

The article very clearly states that it is very possible for unskilled labourers to mix the raw materials in a faulty manner at the cement works, and that the testing would at once find the mistake.

But when the statement is also made that "with proper plant, which at the most would cost say under 20*l.*, an office boy or labourer with ordinary common sense can do all that is necessary," &c., I entirely disagree.

It is pointed out, and rightly so, that the tensile test is generally looked upon as the most important of all, and I do not think any one with a practical knowledge of cement would be willing to trust the office boy or a labourer to make the briquettes, which must be well made for the test of 400 lbs. per square inch.

Then I do not see anything in the article as to the coolness of the cement.

I have tested some hundreds of tons recently, and from various makers, and one case with which I had to deal was very curious, seeing that I was able to pass a large consignment of cement one month after I had condemned it, and during that time the cement had been turned over and properly aërated and cooled, and its tensile strength increased from an average of just over 200 lbs. to nearly 500 lbs. to the square inch.

The reason was the works were turning out such large quantities of cement that this consignment was new and hot.

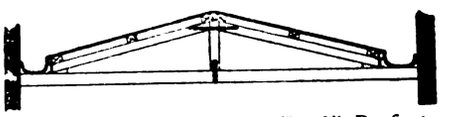
In conclusion I would only advocate that experienced people test cement.

ROBERT H. REED.

County Bridge Works, Fordingbridge, Hants.

"TEXYL" ROOFING.

SIR,—Permit me to thank you for the courteous notice of our Glasgow Exhibition pavilion in your recent issue. Whilst fully endorsing what you say about the importance of the cement used in a composite roofing material such as "Texyl," I should like to say that this system has now undergone a practical test for some years past, being constructed by country builders with ordinary Portland cement. At a house near Uxbridge a large pitched roof and flat, with tiles bedded paving-wise in the cement, was erected in 1896. The surrounding roofs of the same house, built about the same time, have the usual overlapping tiles, and whilst these have occasionally called for repairs and new tiles the "Texyl" roof has required none, but is perfectly sound at the present time, though the flat is liable to be used as a balcony promenade. The enclosed section of the pitched roof will show you that the



Roof-span and Gutters in "Texyl" Roofing.

gutters are continued in the same material instead of being flashed with lead, and these also have answered expectation perfectly. In addition to roofs, Mr. Benson (whose partner I am in this matter) has built a water-tower at Uxbridge mainly of "Texyl" throughout—viz., corrugated sheets stiffened and coated with cement bonded by his patent method. The exterior effect is like plaster or stucco, but it can be varied to any extent, as is shown by the little half-timbered pavilion now at Glasgow.

H. C. MARILLIER.

LOAN EXHIBITION OF ECCLESIASTICAL ART.

SIR,—You have been good enough in previous years to allow me space for a few lines for a reminder of the approach of the time for sending in the list of loans to the Ecclesiastical Art Exhibition. As the time is now drawing near, I hope you will kindly allow me to say that if any of your readers intend assisting the Exhibition by the loan of articles of interest I shall be very glad to hear from them at once.

The collection will, as before, embrace every kind of gold- and silversmith's work, art metal work, tapestry, needlework, carvings in wood and ivory, MSS., paintings, and articles of ecclesiastical and archæological interest.

For church plate and embroidery we are always particularly grateful.

JOHN HART.

Maltravers House, Arundel-street, Strand.

The Student's Column.

GAS AND GAS FITTINGS:

4.—STATION METERS, GASHOLDERS, STATION GOVERNORS, DISTRIBUTION.

STATION METERS.—The gas leaving the purifiers usually passes next to the "station" or "works" meter (fig. 7), in order that the total quantity of gas made may be ascertained and recorded. The meter case is usually rectangular for large meters and cylindrical for those of smaller capacity. Sometimes a separate meter is provided for each retort house. The station meter is always one of the variety known as "wet" meters, in which a drum revolves in a chamber partly filled with water. The drum has three or four internal compartments of equal capacity.

The meter is filled with water to a level a little higher than the axle on which the drum revolves. The gas entering one of the chambers causes it to slowly revolve. As the chamber becomes filled with gas its inlet passes beneath the water level, and the inlet to the next chamber at the same time rises above the water level, and allows gas to enter and continue the revolving motion of the drum.

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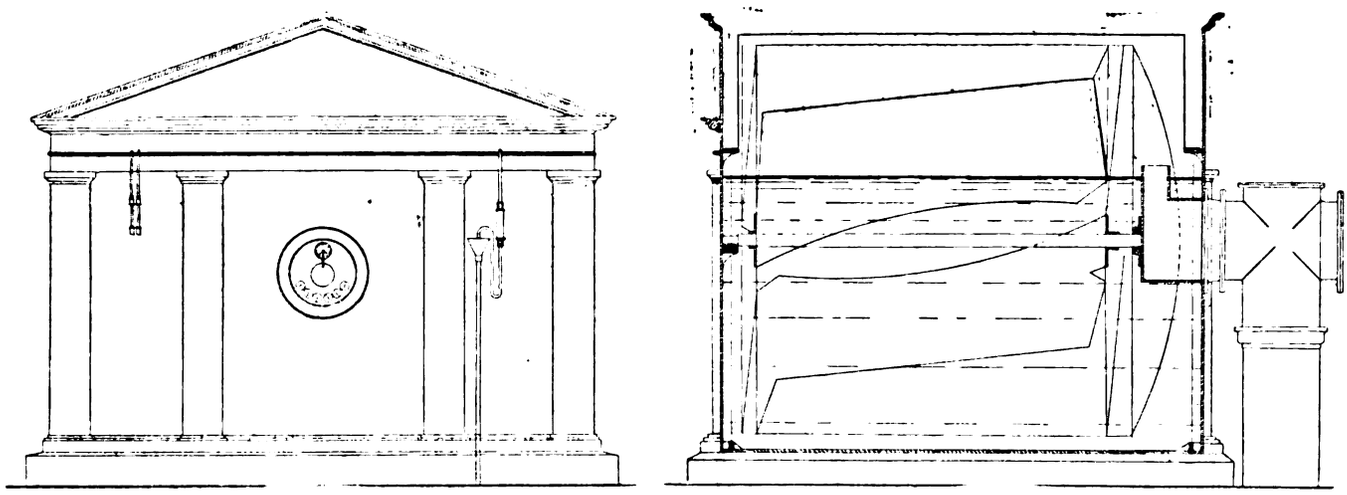

Elevation. Section.

Fig. 7.—Rectangular Station Meter.

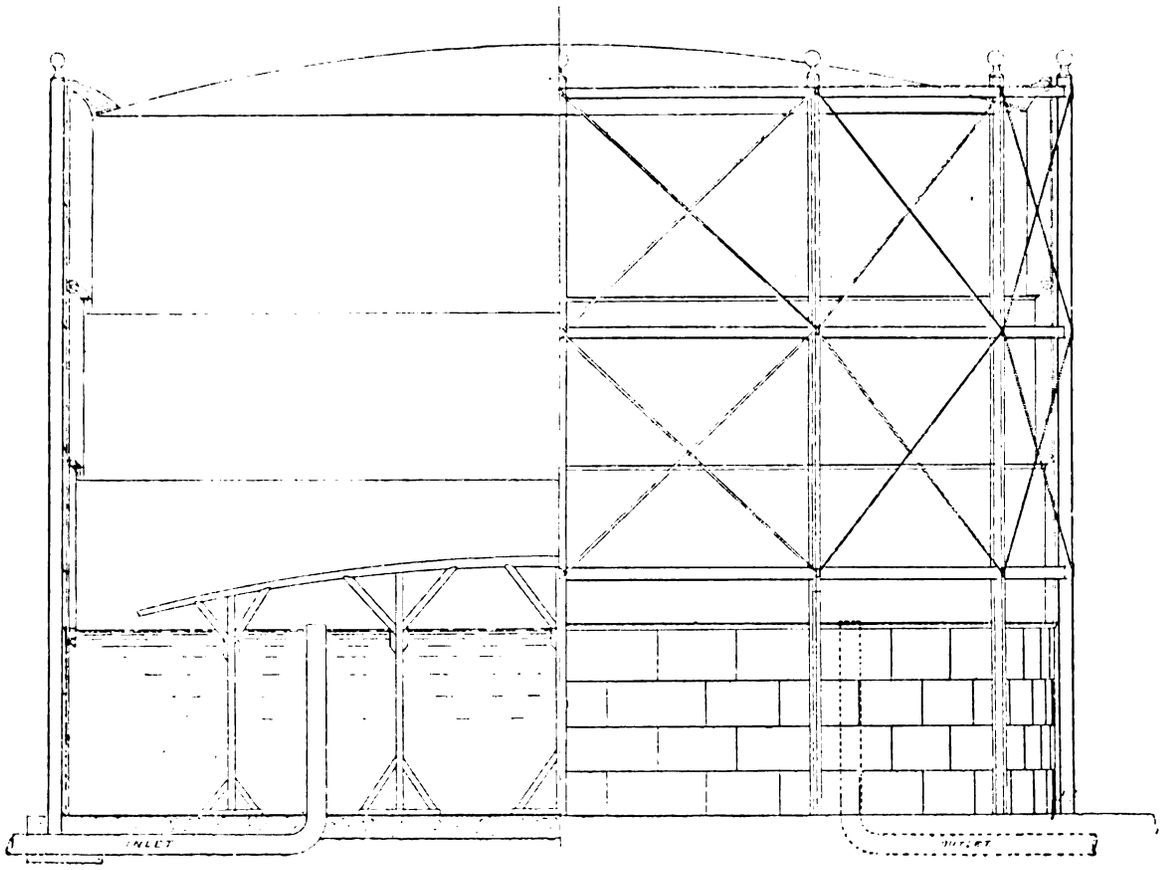

Fig. 8.—Three-Lift Gasholder: showing Tank.

The capacity of the chambers of the drum is dependent on the level of the water; when the water level is too low the gas capacity of each chamber is increased, and the meter registers a smaller quantity of gas than has in reality passed through it, and when the water level is too high the gas capacity of each chamber is decreased and the meter indicates a larger consumption than the correct amount. It is necessary therefore to maintain the water at a constant level, and this is accomplished by supplying the meter with a small but continuous stream of water, and a siphon overflow pipe which prevents the water from rising above the proper water line.

Gasholders.—From the station meter the gas passes into the gasholder (fig. 8). The gasholder is often called a "gasometer" by those not connected with gas undertakings, but the term has long been discarded by gas engineers. The gasholder still remains a gasometer inasmuch as it is possible to estimate roughly the quantity of gas in the gasholder by counting the number of riveted plates (of known dimensions) in a vertical line above the water level in the tank. From the height of the holder above the water, and from its diameter, it is easy to calculate the contents of the holder; but the introduction of the station meter has rendered the use of the gasholder as a meter unnecessary. The gasholder consists of a cylindrical bell which is free to rise and fall in a tank containing water. It is maintained in equilibrium by suitable supports, and has its lower end, which is open, always immersed beneath the surface of the water. The holder may be single or telescopic, the bell which contains the gas being technically known as a "lift." A telescopic holder may have several lifts, but the dome of the top lift serves for all the other lifts, which are merely telescopic cylinders. In a telescopic holder the lower edge of the smaller upper lift is turned outwards and upwards to form an annular trough or "cup," which is filled with water and which receives the turned-over upper edge of the larger cylinder. A gas-tight seal is produced, and when the inner cylinder is filled with gas and continues to rise, its cup is caught by the turned-over edge of the lower and outer cylinder, which is then drawn up out of the water tank without breaking the water seal in the cup. The pressure on the gas within the holder may be as great as 12 in. of water, but varies with the weight of the holder.

The largest gasholder in the world is that erected by Mr. Livesey at the East Greenwich works of the South Metropolitan Company. This holder has six lifts, is 300 ft. in diameter, rises when filled to a height of 180 ft., and has a capacity of 12 million cubic feet. The two topmost lifts ascend above the top of the framing.

The gasholder tank is usually a circular excavation walled with concrete, brick, or stone; a circular or conical mound termed the "dumpling" or "cone" being commonly left in the centre of the tank. Modern gasholder tanks are sometimes constructed in steel and built above ground. Leakages in such tanks are more readily stopped than in those of brick or concrete. Steel tanks are cheaper than brick or concrete tanks, and are said to be almost as durable.

Station Governor.—After leaving the gasholder the gas passes to the station governor (fig. 9), which enables the pressure of gas passing forward to be reduced and regulated to any desired point. The governor most commonly employed consists of a cast-iron water

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tank, through the bottom of which the gas from the gasholder is conducted up by a pipe which terminates in an open end just above the surface of the water. Within the tank is a floating bell which covers the gas inlet and outlet pipes, and from the crown of which a conical or parabolic valve with its apex upwards is suspended. When the bell rises

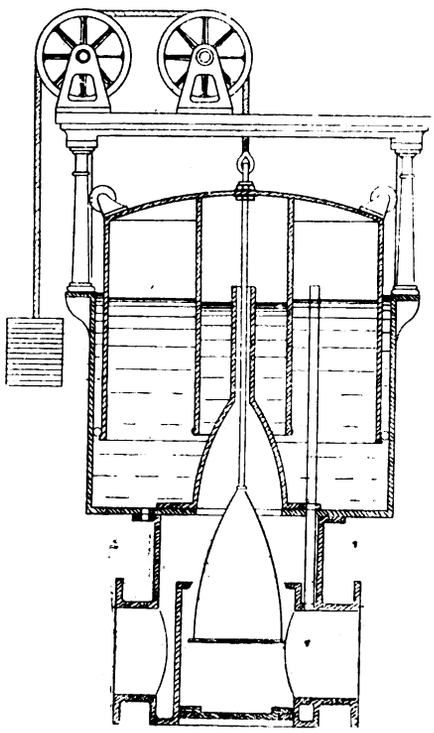

Fig. 9.—Station Governor.

this valve is drawn up with it, and partially blocks the passage through which the gas flows into the bell, and thus diminishes the volume of gas admitted to it. When the bell descends, the cone also descends, and a larger volume of gas can enter the bell. The bell rises when gas is entering at a greater rate than it is being withdrawn by the consumers, and descends when the consumers are withdrawing the gas at a greater rate than it is entering the bell. Thus the varying requirements of the consumers are automatically satisfied without changing the gas pressure. The pressure of the gas at the outlet of the governor is controlled by increasing or decreasing the weight of the bell, which is supported by one or more chains passing over pulleys, each chain terminating in a rod furnished with removable weights. In addition to this governor, a governor is usually fitted to the throttle steam valve of the exhauster engine to control the speed of the exhauster, and sometimes governors are provided in different parts of the district to control variations of pressure produced by the supply of gas over rising ground.

Distribution.—The term "main" is commonly applied to the principal pipe in each street, while "main-service pipes" are those which convey gas from the main to the consumer's meter. The "service pipes" are those which convey the gas from the meter to the point of consumption. Sometimes, however, the main-service pipe is called the service pipe, and the service pipes within the building are spoken of as "fittings."

Mains.—From the gasworks the gas is usually distributed over the district under a pressure of from 1 in. to 4 in. of water. The mains were formerly almost universally made of cast-iron, but wrought-iron and steel mains are now frequently employed. The loss by leakage is much less than it was a few years ago, although higher pressures are now used. The leakage is, however, still too large, and that it is possible in practice to secure gas-tight mains is demonstrated by the fact that at Royersford, near Philadelphia, 20-candle carburetted water-gas is being distributed under a pressure of 20 lbs. to the square inch through wrought-iron mains tested and found gas-tight under a pressure of 60 lbs. to the square inch. From the high-pressure mains the gas is distributed into low-pressure mains, and the former, in which the pressure is allowed to vary, play the part of gasholders. A number of consumers are, however, served direct from the high-pressure mains, house governors being interposed on the main-service pipes. The mains should be so connected that the gas is always in circulation, for gas which is allowed to stagnate in "dead ends" often deteriorates considerably. Mains in level ground are laid with a slight inclination, and provided at the lowest point with a siphon or drip box to collect the liquid which condenses from the gas. The condensed liquor is pumped out of these boxes periodically.

Discharge of Gas Through Pipes.—Tables giving the volume of gas in cubic feet which will pass through pipes of different lengths and different diameters under different pressures, will be found in "Hurst's Surveyor's Handbook," and in most other books dealing with gas supply. The rate of flow diminishes as the length of pipe increases, and varies also with the specific gravity of the gas. The following is the formula deduced by Dr. Pole for calculating the quantity of gas which will pass through pipes of different sizes :—

$$Q = 1{,}350\, d^2 \sqrt{\frac{h \times d}{s \times l}}$$

Where Q = quantity of gas passed in cubic feet per hour.

d = diameter of pipe in inches.
l = length of pipe in yards.
h = initial pressure in inches of water.
s = specific gravity of the gas.

The following figures from the tables of Newbigging and Barlow, which have been calculated from Pole's formula, will serve to indicate the effect of increasing the length of pipe upon the rate of flow of the gas (sp. gr. 0·4), the retarding influence exerted by friction between the side of the pipe and the flowing gas being considerable :—

Diamcter of Pipe 1 in.

Length of pipe in yards	10	20	30	50
Cubic feet of gas delivered under initial pressure of 1 in.	675	476	389	301
Cubic feet of gas delivered under initial pressure of 1·2 in. ...	738	522	427	329

Diameter of Pipe 36 in.

Length of pipe in yards	1,000	5,000	10,000
Cubic feet of gas delivered under initial pressure of 1 in. ...	530,000	234,000	166,000
Cubic feet of gas delivered under initial pressure of 2 in. ...	741,000	332,000	234,000

In practice, however, the actual discharge is considerably less than the theoretical quantity, especially in the case of small pipes. The smaller the pipe the greater the friction per unit of gas delivered. Hurst gives a table based on actual experiments showing the gas (sp. gr. not quoted) discharged through small service pipes of various lengths, from which we take the following :—

Diameter of Pipe 1 in.

Length of pipe in yards	10	20	30	50
Cubic feet of gas delivered under initial pressure of 1 in.	337	233	190	148
Cubic feet of gas delivered under initial pressure of 1½ in.....	368	260	212	164

It will be seen that the discharge of gas obtained at the burners from small service pipes is only about one-half the volume that should, according to Pole's formula, pass through the pipes if perfectly straight and horizontal

Even for larger pipes the volumes of gas discharged quoted by Hurst are much smaller than those given by Newbigging, as will be seen from the following comparative figures :—

Diamcter of Pipe 12 in.

Length of pipe in yards	500	1,000
Cubic feet of gas delivered under initial pressure of 1 in. (Hurst)	33,255	23,515
Cubic feet of gas delivered under initial pressure of 1 in. (Newbigging)	47,433	33,631
Cubic feet of gas delivered under initial pressure of 2 in. (Hurst)	47,030	33,255
Cubic feet of gas delivered under initial pressure of 2 in. (Newbigging)	67,262	47,433

In practice it is better to adopt the figures quoted by Hurst, for the introduction of angles and curves in the pipes, and the accumulation in them of liquid or solid matter tends to diminish their delivering capacity. The smaller the pipes the greater their liability to become blocked with naphthalene, tarry matter, rust, or water. The present tendency in gas supply is to distribute it at a considerably greater pressure than 1 in. The delivering capacities of the pipes vary approximately directly as the square root of the pressure and inversely as the square root of the length. If the pressure is increased four times the volume of gas delivered is doubled. If the length of pipe is increased four times the quantity of gas delivered is halved.

Main-service Pipes.—The main-service pipes should be of wrought iron, unless the employment of this material be prohibited by the corrosive action of the soil. Cast-iron pipes are often used, but are apt to have leaky joints, and lead pipes are apt to become distorted owing to subsidence of the ground in which they are buried. The diameter of the service-pipe required is dependent upon the description and number of the appliances to be supplied. It is usual to assume that each burner requires 5 cubic feet of gas per hour, but as most consumers use a large proportion of the gas consumed for purposes other than lighting this rule is now of little service. Domestic gas fires commonly consume over 30 cubic feet per hour, ring burners from 12 to 15 cubic feet, while cookers and water heaters use an indefinite quantity but require a comparatively large volume for a short period. The capacity of the pipes required should not be calculated npon the average hourly consumption, but upon the consumption when every gas-consuming appliance in the building is in use at the same moment, and at the lowest pressure permitted by Act of Parliament. As a rule, the gas manufacturer provides and fits the main service-pipe and meter; and, owing to the comparatively heavy cost of pipes of large diameter, frequently supplies a pipe barely large enough for the duty required from it when the gas is first connected to the building, and as additional fires and stoves are usually introduced from time to time after the service-pipe has been laid, it frequently happens that the pipe is not sufficiently large for the work it is expected to perform. The consumer obtains a very low efficiency in light or heat per unit of gas consumed, and naturally concludes that the manufacturer is supplying "bad gas," and regards it as an additional injury that his gas appears to be worst just at the time he most urgently needs an ample supply (as on a cold, foggy day), and all his neighbours are simultaneously drawing heavily upon the supply. The fact that the gas bill is a little less heavy does not in any way compensate for the fact that the gas fails to perform its legitimate duties.

Fig. 6a.—A correspondent asks, in reference to our last week's article, why valves and by-passes are provided in the connecting pipes to a set of purifiers, as shown in fig. 6(a), published in the issue of last week. They are provided to enable the gas to be sent in any order of rotation through the purifiers, and to enable any purifier to be disconnected from the other purifiers in the set without putting the whole set out of action. Our illustration shows the connexions for a set of three purifiers, Nos. 1, 2, and 3, and it will be seen that with the arrangement of pipes and valves there figured it is possible to send the gas in the

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order of rotation Nos. 1, 2, 3, or Nos. 3, 1, 2, or to cut off No. 2 for recharging, and allow the gas to continue to be purified by passage through Nos. 1 and 3. Any number of purifiers may be placed in circuit in a set, and several sets may be connected together; but provision must always be made for continuous purification. A clean purifier must always be in readiness to be put into action immediately the gas at the outlet of the last purifier in use begins to come through "dirty." In London the gas companies are liable to a penalty of 50*l.* per day if even an infinitesimal trace of sulphuretted hydrogen be found in the gas supplied to consumers, and great care has to be exercised to prevent any unpurified gas escaping into the mains.

OBITUARY.

MR. H. YEOVILLE THOMASON. — The death of Mr. H. Yeoville Thomason, formerly of Birmingham, and whose name is well known as the architect of the Municipal Buildings and Art Gallery in that city, took place last week at his house at 9, Observatory-gardens, Campden Hill, London. From a notice in the Birmingham *Daily Post* we learn that Mr. Thomason belonged to an old Birmingham family, and his grandfather, Sir Edward Thomason, held the position of High Bailiff before the incorporation of the Borough, and was a manufacturer who was also interested in art. Mr. H. Yeoville Thomason was born in Edinburgh in 1826. When it was decided that he should follow architecture as a profession, he was articled to a Birmingham architect, Mr. Charles Edge, and subsequently became manager of the architectural department in the Borough Surveyor's office. Subsequently he travelled a good deal and made a study of architecture in Italy. Before he was engaged on public buildings he was chiefly occupied in designing private residences in Edgbaston and other suburban districts of Birmingham, from 1840 to 1870. Among important buildings which he carried out may be mentioned the Aston Workhouse (about 1865), one of the largest works on which he was engaged; the Acocks Green Congregational Chapel; the Birmingham District and Counties Bank, in what may be described as a neo-classic style—it is one of the best of the larger street fronts of Birmingham; the Birmingham *Daily Mail* offices; and the Birmingham *Daily Gazette* offices Among manufacturing works and warehouses which he carried out were the Atlas Works for Messrs. Horace Woodward; a block of offices and shops for Messrs. Thos. Hope Bros., at the corner of New-street and Cannon-street (Birmingham); the large establishment of Messrs. Lewis, the first concrete and iron building erected in Birmingham, and his last large executed work, completed in 1886, after which he retired from practice. The Municipal buildings of Birmingham, part of which forms also the Corporation Art Gallery, a very large building in a grandiose style, will keep his name in memory in that city, where it seems to have given every satisfaction to his municipal clients. Mr. Thomason considered that his arrangement of the seating in the Council Chamber at Birmingham had furnished a model for the arrangement of several subsequently erected Council rooms. Though Mr. Thomason adopted the Gothic style in some churches and in some of his houses, his preference was always for classic architecture, and he was a great admirer of Wren. During his many years' residence and practice in Birmingham Mr. Thomason took no part in public affairs, his interest being entirely absorbed by his professional work, and he continued after his retirement from practice to take an interest in everything connected with architecture and architectural work.

Mr. Thomason was elected a Fellow of the Institute of Architects in 1862. We gave illustrations of the Municipal Buildings and of the Union Club House in connexion with the article on Birmingham architecture ("Architecture of Our Large Provincial Towns") in the *Builder* of November 27, 1897.

GENERAL BUILDING NEWS.

CHAPEL, KING'S NORTON.—The foundation-stone has just been laid of a new Weslevan chapel at King's Norton. The architect is Mr. Ewen Harper. The building is to be built of red brick with York stone dressings, and will consist of a nave and aisles divided by granite columns. Immediate provision is to be made for 480 sittings, and the plans permit of further accommodation being secured when necessary by the addition of transepts and a chancel. The main entrance is to face Middleton Hall-road, and the porch consists of a moulded stone archway with pinnacles and pediment. There is a second entrance from the front, in the tower, by which access is gained to the gallery. The builders are Messrs. Harley & Son, of Smethwick.

CATHOLIC CHURCH EXTENSION, WITHINGTON.—The foundation-stone was laid recently of additions that are being made to the Church of St. Cuthbert, Withington, Manchester. Messrs. Goldie, of London, are the architects.

ADDITIONS TO CONGREGATIONAL CHURCH, WALSALL.—The memorial-stones have just been laid of an enlargement of the Wednesbury-road Congregational Church, Walsall. The architects are Messrs. Crouch & Butler, Birmingham, and the designs include the addition of a chancel, and about 200 additional sittings to the church.

WESLEYAN METHODIST CENTRAL HALL, BIRMINGHAM.—On the 16th inst. the foundation-stones were laid of a new central hall for the Birmingham Wesleyan Methodists. The site of the new building is nearly opposite the Assize Courts. It covers an area of 2,766 square yards, and the building will have frontages to three streets—to Corporation-street, which is the main elevation, measuring 224 ft., to Ryder-street 113 ft., and to Dalton-street 276 ft. In the centre of the building is a tower, rising to a height of 180 ft. On the ground floor are fifteen shops, with basement shops, together with sale rooms, warehouses, and other offices for commercial purposes. One basement, capable of accommodating 500 children, will be retained by the mission as a ragged school, and will be fitted up with cooking arrangements for the feeding of the poor in time of need. On the first and second floors are the large hall, synod hall, and other rooms for Methodist purposes. The main entrance under the tower leads into a hall, where two staircases lead to the first floor landing. Here, by turning to the left, access is gained to the synod hall and church house, and by turning to the right and ascending a few steps the level of the great hall is reached at the platform end. The corridors which run round the great hall give access on the outside to twelve committee-rooms; and on the inside are frequent entrances to the great hall. The hall is 140 ft. long, 90 ft. wide upstairs, and 48 ft. high, with seating accommodation for 2,300 persons (300 being on the orchestra and 2,000 in the auditorium). There are no seats under the gallery. On the lower or left-hand side of the tower is the church house. The corridor leading from the stairs already mentioned has on its left (or Corporation-street side) a committee-room and the synod hall, which will seat 500 persons; and on the right another committee-room and the Sunday-school. Along the corridor are two rooms, the library and the ladies' parlour, which look out on Ryder-street. On the floor above are twelve club and classrooms. There are in all five entrances. The chief material employed in the façade is red terra cotta. The entire cost of the scheme is estimated at from 60,000*l.* to 65,000*l.* The plans were prepared by Mr. Ewen Harper, and the contractors are Messrs. John Bowen & Sons.

CHURCH, EAST KIRKBY, NOTTS.—A new church is being erected at East Kirkby. The building will consist of a nave 78 ft. long and 27 ft. wide internally, with aisles (merely passages 4 ft. wide), a chancel 30 ft. long and 21 ft. wide, vestries for clergy and choir, with heating chamber under, and bell turrets at the west end. The principal entrance will be at the west end facing Lowmoor-road, the highway between Nottingham and Mansfield, and an internal porch will be formed by a screen and swing doors. The church is planned to accommodate about 360 adults, and to admit of lateral extension by increasing the width of one or both the aisles according to future requirements. The nave and aisles are divided into five bays, with octagonal stone columns and moulded arches springing from the piers without capitals. The chancel arch will be enriched with carving. The roofs will be of open timber construction, with hammer-beam trusses, the wood being stained dark walnut colour. The floor under the seats will be of wood blocks, and in the passages, &c., of terrazza and marble mosaic. The walls will be of brick, with red facings and stone dressings externally, and plastered and distempered internally, except where stonework is used. The windows will be of stone, the arched heads being filled with tracery. The glazing will be of leaded cathedral glass, in small quarries. The roofs will be covered with red tiles, and the turret roofs with lead. The heating will be by means of hot water on the low-pressure system. The architect is Mr. Louis Ambler.

CHURCH, PONTARDULAIS.—The new Church of St. Michael and All Angels, Pontardulais, was opened by the Lord Bishop of St. David's recently. The architect of the church was Mr. E. M. Bruce-Vaughan, Cardiff, and the contract was entrusted to Messrs. John Thomas & Sons, Pontardulais. There are 302 sittings. The church consists of a nave, chancel, vestry, and organ chamber. The walls are of grey stone, and the roof is covered with green slates. The nave and organ chamber and vestry walls are pierced with two-light traceried windows, the west wall of the nave with a five-light, and the east wall of the chancel with a three-light window. The window and door dressings, as well as the copings to gables, are all executed in Box ground stone. The double bell-cote surmounting the chancel arch is chiefly built of Box ground stone. The roof of the chancel is waggon-shaped. The nave and chancel seats are in pitch pine.

CHURCH, SPARKBROOK, BIRMINGHAM.—The new Church of St. Agatha, at Sparkbrook, was dedicated by the Bishop of Worcester recently. St. Agatha's Church, says the *Birmingham Post*, has cost 15,000*l.*, and this amount will be paid out of the proceeds of the sale of Christ Church, which was for many years a well-known landmark in the centre of the city. The original foundation-stone of the old church has been built into the base of the tower of the new structure, and among other things taken to Sparkbrook from New-street are the font and communion-table; the single bell, bearing the inscription "John Rudhall, Gloucester, Fect. 1813"; and a quantity of the mahogany panelling of the old pews of Christ Church, which has been used in the new baptistry and in the clergy vestry. The church occupies a site adjoining the Board Schools in the Stratford-road, and has been erected from the designs of Mr. W. H. Bidlake, and under his superintendence. "It is in the late decorated Gothic style, with an original interpretation of traditional forms," and accommodation is afforded for more than 1,000 worshippers. The materials employed are buff brick facing within, and red and blue brick without, with Hollington stone and Bath stone dressings. The roofs are covered with grey-green Whitland Abbey slates. The tower is 120 ft. high to the top of the parapet, and is surmounted by a fleche rising 40 ft. higher. From the base of the tower projects a semi-octagonal baptistry, over which is the west window, which is in turn surmounted by sculpture in canopied niches, representing Christ in majesty, supported by the angels of Justice and Pity, and surrounded by angels. On the north and south sides of the tower, and forming with it a symmetrical façade, are porches, whose tympana are filled with sculpture illustrative of the martyrdom of St. Agatha; whilst the arch mouldings are decorated with cherubs' heads. The interior consists of a nave 120 ft. long and 29 ft. wide, separated from wide aisles by arcades of Hollington stone arches. Projecting shafts rise between the arches, and, terminating at the cornice level in corbels of leaf sculpture, carry transverse timber arches supporting the timber ceiling, which is partly decorated in colour. The clearstory, and, indeed, the church generally, is lighted by traceried windows, nearly every window being of different design. The chancel is also terminated with a traceried window, which it is hoped may be filled with painted glass. The chancel is separated by arcades from a choir transept, over which is the organ chamber on the north side, and from an ambulatory which communicates with the vestries on the south. The choir seating is of fumigated oak, that of the nave being of sequoia wood. The pulpit, also of fumigated oak set on a stone base, is the gift of Mr. A. M. Chance. The builders were Messrs. John Bowen & Sons.

EXTENSION OF ST. ANDREW'S SCHOOLS, WIGAN.—The foundation-stone of an extension of St. Andrew's Schools, Wigan, was recently laid. The architects for the work are Messrs. Heaton, Ralph, & Heaton, whilst the new premises will be built by Alderman C. B. Holmes.

EXTENSION OF U.F. CHURCH TRAINING COLLEGE, ABERDEEN.—A scheme of extension is in contemplation in connexion with the United Free Church Training College, Aberdeen. Some time ago Mr. Wm. Kelly, architect (of Messrs. W. & J. Smith & Kelly), prepared plans of a new practising school which it is proposed to build on a site of what is known as Hector's building yard, with the frontage to John-street. These plans are at present being considered.

BUILDINGS IN ABERDEEN.—The Plans Committee of the Town Council have approved of the plans of the following new buildings in Aberdeen: Alterations and additions in connexion with premises No. 54, Skene-square, per Mr. R. G. Wilson, architect; addition to Carden House, Carden-place, per Mr. R. G. Wilson, architect; two houses on the north-west side of Wallfield-crescent, for Mr. Alexander Cheyne, builder, per Mr. A. H. L. Mackinnon, architect; additions to stonecutting sheds on the south side of Froghall-lane, for Mr. James Forbes, sculptor; alterations in connexion with premises No. 3, M'Combie's-court, per Messrs. W. & J. Smith & Kelly, architects; re-roofing of workshop on the north side of Huntly-street, for the Royal Fire and Accident Co., Ltd., per Mr. John Milne, architect; alterations in connexion with premises Nos. 43-44, Castle-street, per Mr. William Ruxton, architect; dwelling-house on the north side of Rubislaw Den South, per Mr. R. G. Wilson, architect; workshop at the rear of No. 56, Hutcheon-street; nine dwelling-houses on the west side of King-street and south side of University-road, per Mr. William Ruxton, architect; addition to premises on the east side of Old Ford-road, per Messrs. Brown & Watt, architects; fishcuring premises at North Esplanade, per Mr. Alexander Craigen, draughtsman; alterations in connexion with Robert Gordon's College, for the governors, per Messrs. Jenkins & Marr, architects; alterations in connexion with sheds on the east side of Regent-road, per Messrs. W. & J. Smith & Kelly, architects; two dwelling-houses on the south side of Elmbank-road, per Mr. John Cameron, architect; dwelling-house on the west side of Holburn-street, per Mr. John Cameron, architect; church on the east side of King-street, at its junction with Urquhart-road, for the Deacons' Court of the Commerce-street U.F. Church, per Messrs. D. & J. R. M'Millan, architects.

MUNICIPAL LODGING HOUSE, ST. PHILIP'S, BRISTOL.—With regard to the proposed municipal lodging-house to be erected in St. Philip's, the Health Committee recommend that the house shall

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contain 120 beds instead of 102, as originally intended. The site selected is at the junction of Wade-street and River-street. The building will be of brick, the only freestone ornamentation being at the main entrance at the angle formed by the junction of the two streets. It will consist of basement and four floors, and the roof will be of Bridgwater tiles. The clear height from floor to ceiling on each floor will be 11 ft., except the basement, which is 10 ft. 6 in. The plans have been prepared in the City Engineer's office. The basement will contain a series of lockers for the use of the lodgers, a laundry, a lavatory, linen store, baths, boiler house, and other offices. The ground floor will comprise entrance lobby, vestibule, and corridor leading to a large reading-room, 27 ft. 6 in. by 14 ft. 6 in., beyond which will be situated the dining hall. On the right of the hall will be the main staircase, of pennant stone, leading to the floor above. There will be a lodgers' kitchen, 31 ft. by 16 ft., in which the lodgers will do their own cooking, and the arrangements will also include wash-up sinks and other requisites, while at the rear of the building there will be a large open paved yard. The residence of the superintendent will be on the ground floor, and this will be provided with a separate entrance. The main entrance will be fitted with turnstiles. On the first, second, and third floors the accommodation in each will consist of forty cubicles, 8 ft. by 5 ft., approached by corridors, 4 ft. 3 in. in width. Each cubicle will have a separate door and window, and screen walls will form the partition. The estimated cost of building, including site, but exclusive of furniture, is 7,100*l.*—*Western Press.*

NEW BRIDEWELL, DUBLIN. — A new central Bridewell for Dublin is being built at the west side of the Police-courts. The building has a frontage of 170 ft., and is 40 ft. high and 45 ft. deep. It will provide accommodation for upwards of 130 prisoners, in fifty-two cells. In many cases each cell will be occupied by only one prisoner. There are, however, a number of cells—about thirty—which will contain more than one inmate, one of them having as many as six beds. The single cells are 13 ft. 9 in. long by 6 ft. 8 in. wide, and 9 ft. 6 in. high, while the largest of the common cells is 38 ft. long by 13 ft. 9 in. wide. On the ground floor there will be accommodation for nineteen men and fifteen women, while on each of the two floors higher there will be cells for seventeen women and thirty men. There are 122 beds altogether. In addition to the cells there are apartments for an inspector, offices, dayrooms, male and female warders' rooms, men's and women's receiving-rooms, escorts' offices, &c. The roof is a flat concrete and asphalte one, while the centre of it will be covered with glass in order to light the corridors beneath. On the top of the building is a studio and darkroom for photographing the prisoners and developing the photos. The whole building will be heated with hot air on the Plenum system. The floors are of concrete and expanded metal. The building will be connected with the police-courts by an underground passage. The contractors for the work are Messrs. John Lowry & Son, Belfast, and the architect is Mr. J. H. Pentland, of the Board of Works.

HALL AND BRANCH PUBLIC LIBRARY, EDINBURGH.—The plans of the new Nelson Hall and Branch Library in Leith Walk are now before the Dean of Guild Court. The front buildings towards Leith Walk have been made three stories high, and those towards M'Donald-road two stories. The Nelson Hall and the Library, which are behind, are kept one story. The two upper flats towards Leith Walk contain a house for the librarian and for a caretaker, entering by a separate stair from Leith Walk. The upper floor, towards M'Donald-road, contains a large hall, which it is proposed to fit up as a gymnasium. It measures 55 ft. by 30 ft. wide, and retiring-rooms and lavatories have been provided. The corner has been emphasised with an octagonal and round tower. The main entrance is placed near the corner in M'Donald-road, and leads into a large entrance hall, from which access is obtained to the library and halls. On the plan, right in front of the entrance is the lending library—40 ft. by 30 ft.—where accommodation is provided for 20,000 volumes. To the left of the library, occupying the frontage to Leith Walk, is the reading-room, measuring 55 ft. by 21 ft. It is separated from the library by a row of columns and arches. The lower part of the tower is formed into a large corner oriel window. This room will be supplied with newspapers, weeklies, magazines, &c. The Nelson Hall measures 78 ft. long by 50 ft. wide, and is divided by two rows of columns and arches, which in turn carry the open roofs. The main part of this hall will be lighted from the roof, but the front portion will have large mullioned windows to the front. The whole of the building will be heated with hot water and lighted with electric light. The architect is Mr. H. Ramsay Taylor (of Lessels & Taylor).

HOME FOR CRIPPLES, BANGOR, CO. DOWN.—The Mrs Stewart Memorial Home for Cripples, Bangor, was opened recently. The builder was Mr. James Kidd, and the sanitary fittings were by Messrs. John Dowling & Sons. The plans for the structure were prepared by Mr. W. J. W. Roome, of Belfast.

WESLEYAN CHAPEL, WALKHAMPTON, DEVONSHIRE.—The foundation-stones were laid recently of a new Wesleyan church at Walkhampton. The new building is to be erected by Messrs. Toop & Sons, of Horrabridge, from designs by Mr. H. J. Snell, of Plymouth. The building is to be of local stone, with brick dressings, and a slated roof.

ISOLATION HOSPITAL FOR HANDSWORTH.—Mr. W. E. Fletcher, M.B., inspector of the Local Government Board, held an inquiry at the Woodhouse Endowed School recently, into the application of the South Rotherham, Handsworth, and Kiveton Park Isolation Hospital District Committee, to borrow a sum of 16,000*l.* for the purchase of a site and erection of a hospital at Aughton. Mr. H. L. Parry said that the site was contiguous to the Rotherham and Pleasley-road, and there was easy communication by road to all parts of the district. The altitude was 325 ft. The number of beds proposed to be provided was thirty-two, and the estimated cost of the buildings was 14,301*l.*, made up as follows: Administrative buildings, 3,300*l.*; laundry, mortuary, and stables, 1,966*l.*; lodge, 367*l.*; scarlet fever block, 2,807*l.*; enteric fever block, 1,455*l.*; isolation block, 1,207*l.*; boundary walls and entrances, 800*l.*; roads and laying-out grounds, 350*l.*; drainage, 210*l.*; architect's commission, 620*l.*; furnishing wards, 640*l.*; furnishing administrative block, 450*l.*; total, 14,301*l.* Mr. J. W. Webster, (Sheffield), the architect for the hospital, explained the plans at some length.

THE EXTENSION OF LEEDS PUBLIC HOSPITALS.—The Sanitary Committee of the Leeds City Council, at a special meeting on the 18th inst., had under consideration the policy to be adopted in the letting of the contracts for the extension of the Seacroft, until lately known as the Manston Hospitals. The subject was introduced by a deputation representing the master plumbers, plasterers, slaters, and painters of the city. They requested the Committee to let the work for the extension of the hospitals, when the time came, to the separate trades, instead of, as is frequently done at present, to a general contractor. One reason for the change, they urged, was that at times they were liable to the loss of their money. The Committee decided to let the work in one contract, subject, however, to these conditions:—(1) That the contractor should have power to sub-let to such master tradesmen as might be approved of by the Committee; and (2) That a clause should be inserted requiring the chief contractor to produce to the architect a receipt for the payments to subcontractors before he himself should be paid by the Council. The meeting was presided over by Mr. E. E. Lawson (chairman), and Mr. J. T. Hall, the architect of the new hospitals, was in attendance. The extension scheme, which has already received the sanction of the Council, will cost about 200,000*l.*—*Yorkshire Post.*

PARISH HALL, CLAPTON. — The Countess of Shaftesbury laid the foundation-stone recently of a parish hall to be erected on the south-west side of St. James's Church, Clapton, on a portion of the ground which forms the freehold of the vicar. Mr. W. D. Caroe is the architect.

BUILDING TRADES' EXCHANGE, SHEFFIELD.—The Sheffield Building Trades' Exchange Company, Limited, have recently purchased from the Corporation land in Upper Charles-street and Cross Burgess-street, containing about 263 square yards, and upon it are erecting premises for the purpose of an exchange and club, with large saleshop under. The exchange has its entrance front in Cross Burgess-street. The entrance porch is 7 ft. wide, with an arched outer opening with wrought-iron gates, and with inner doors leading into a circular hall 16 ft. diameter, with columns all round it. The exchange-room opens directly from the inner hall by six doors, and is an apartment 40 ft. long, 30 ft. wide, and 18 ft. high. The secretary's office, also opening from the inner hall, and commanding a view of the exchange-room, is 14 ft. 9 in. by 14 ft. 6 in. There is ample cloakroom accommodation and a telephone boxroom. The staircase is to be of stone, 4 ft. 6 in. wide, leading up to the committee-room, 38 ft. by 14 ft. 6 in., and 14 ft. high, which will also be used for arbitration cases. A little further up the staircase is a billiard-room the same size as the exchange-room below, and a refreshment bar. In the upper floors are a committee-room, a kitchen, and a caretaker's house. There is a back staircase and a hoist from top to bottom of the building for communication from the kitchen to each floor. The saleshop is in Upper Charles-street, and is below the exchange-room. The elevations to the two streets are in brick, with stone dressings. The contractors for the work are B. Powell & Son, masons and bricklayers; J. S. Teanby, joiner; Inman & Hayhurst, plumbers; W. Proctor, slater; Hudson & Dore, plasterers; Smith & Snape, painters; T. W. Ward, ironfounder; and the architects are Messrs. Gibbs & Flockton.

AGRICULTURAL COLLEGE, WYE.—New buildings have been erected at the South-Eastern Agricultural College, Wye, and these have just been opened by the Rt. Hon. R. W. Hanbury, M.P. The new buildings and alterations to the college were begun early in 1900 and finished at Easter, 1901, Mr. T. E. Collcutt being the architect, and Mr. J. J. Wise, of Deal, the contractor. The work consisted of the extension of the quadrangle, begun in 1894, as far as the boundary of the college property, and the addition of a further wing, together with additions and rearrangements in the kitchens and other domestic buildings. The biological laboratory has hitherto been also used as a subsidiary lecture-room; this is now discontinued, a second laboratory bench has been made running down the middle of the room, so that there is now working space for thirty students. Opening from this laboratory a smaller one has been built for the professor of botany. A similar laboratory has been built for the special work of the lecturer in zoology and economic entomology. Adjoining these laboratories is the museum. The adjoining lecture-room is also new. The drawing office occupies one corner of the new quadrangle; it is 33 ft. long, and provides working space for twenty-four students. The eastern side of the new quadrangle is completed by the principal's offices and a common room for the students. The chemical laboratories occupy the ground floor of the new wing, which runs to the eastward of the main block of buildings. The general students' laboratory measures about 45 ft. by 30 ft., and gives working space for thirty students, besides other benches for special work. Separated from the main laboratory by a glazed partition is the balance-room and the larger of the special laboratories for analytical work and research; adjoining this comes a smaller room reserved for gas analysis, &c., and lastly there is a small room for furnaces, a drying chamber and space for ether extractions and other operations involving the use of inflammable liquids. The old building, formerly used as a laboratory, is now taken into the domestic offices. On the first floor of the new buildings additional students' rooms have been built, so that there is now accommodation within the college for fifty students and two members of the staff.

FOREIGN.

FRANCE.—M. Puech, the sculptor, has completed the model for the monument to Jules Simon to be erected in the Place de la Madeleine. He has represented Simon as standing, with arms folded, by the side of a tribune. The pedestal is adorned by two bas-reliefs, one of them representing Simon, at the Collége de France, protesting against the *coup d'état* of 1852; the other shows him surrounded by figures symbolising his philanthropic work.——M. Daumet, the architect to the Palais de Justice, has found in the cellars of that building four ancient tapestries which formed part of the famous "Chancelleries" collection. They have been sent to the Gobelins manufactory for repair.——The General Council of the Seine has decided on the creation, at Paris, of a school of "Arts et Métiers," to be built on the site of the old abattoirs at Villejuif.——There is talk of the formation of a "Commission Archéologique" to search for and preserve antiquities in the Department of the Seine.——The city of Lyons is about to open a competition for a new fire brigade barracks.——The exhibition of works in painting executed by the candidates for the Prix de Rome has been opened at the Ecole des Beaux-Arts. The subject given was "Christ Healing the Sick, at Evening, before the Gate of a Town." Among the competitors M. Clément Gontier, a pupil of M. J. P. Laurens, has produced a very good work. The award is not yet made.——At Lyons a building is to be erected as a conservatoire of music together with a concert hall and an art exhibition gallery.

UNITED STATES.—The supervising architect of the Treasury has invited several eminent American architects to submit plans for the new building for the Department of Agriculture.——Judging from the progress made in constructing the rapid transit subway from the New York Post Office to Kingsbridge, this important work will be finished and opened for traffic in the autumn of 1903.——Plans are being prepared for a new subway in Brooklyn, the preliminaries having been approved by the city authorities.——The War Department has approved the plans for the North River bridge, from Fifty-ninth-street to Weehawken, New York. The bridge is estimated to cost sixty millions of dollars.——The foundations of the public library building in Bryant Park, New York, are completed, and the contract for the superstructure awarded. The building will occupy the greater part of a city block, and will be built of marble throughout.

INDIA.—The platform and other improvement works at Lahore Railway Station have now been practically completed.——We learn that it has been decided to roof in all drinking water reservoirs connected with cantonments in India, and the work is to be taken in hand as funds become available. The object is to reduce the possibility of contamination from dust.——The Secretary of State has sanctioned the expenditure for doubling the section of the main line of the Bombay, Baroda, and Central India Railway between Dahanu and Sachin, a distance of eighty miles.

OPEN SPACES (LONDON). — The Leyton-square public garden, Peckham Park-road, has been recently opened. The freehold was acquired for 3,000*l.*, the London County Council and the Camberwell (old) Vestry contributing one-half of that sum respectively. The Metropolitan Public Gardens Association laid out the ground at a cost of about 600*l.*

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MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Lincoln & Co., of Glasgow, manufacturers of fireclay goods and sanitary ware, have opened a London office at Broad-street House, New Broad-street, E.C., and have appointed Mr. Edward Huxley as their London representative.——Mr. S. G. Thacker, surveyor, has changed his address from 22, Montague-street, Russell-square, to 90, High Holborn.

INCORPORATED CHURCH-BUILDING SOCIETY.—This Society held its usual monthly meeting on the 18th inst. (being the last for the present session) at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Badshot Lea, St. George, near Farnham, Surrey, 75*l.* for the first portion; Bristol, All Hallows, 200*l.* in lieu of a former grant of 150*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Alberbury, St. Michael and All Angels, near Shrewsbury, 15*l.*; Clapham, St. Peter, Surrey, 70*l.*; Claverley, All Saints, near Bridgnorth, Salop, 30*l.*; Fletton, St. Margaret, near Peterborough, 20*l.*; Hoo, All Hallows, near Rochester, 10*l.*; Landulph, St. Dilphe and St. Leonard, near Hatt, Cornwall, 50*l.*; Stepney, St. Faith, Middlesex, 100*l.*; Tetbury, St. Mary, Glos., 10*l.*; Ticehurst, St. Mary, near Hawkhurst, Kent, 20*l.*; and Tremaine, near Egloskerry, Cornwall, 15*l.* Grants were also made from the special Mission Buildings Fund towards building mission churches at Cowper Quay, near Blyth, Northumberland, 20*l.*; and Walthamstow, St. Luke, Essex, 50*l.* The following grants were also paid for works completed:—Carlisle, St. Aidan, Cumberland, 1,000*l.*; Douglas, St. Matthew, Isle of Man, 130*l.*; Eastleigh, Church of the Resurrection, Hants, 200*l.* on account of a grant of 250*l.*; Notting Hill, St. Columb, Middlesex, 220*l.* on account of a grant of 250*l.*; Horndon-on-the-Hill, St. Peter and St. Paul, Grays, Essex, 25*l.*; and Bishopwearmouth, St. Gabriel, Sunderland, 50*l.* In addition to this, the sum of 134*l.* was paid towards the repairs of thirteen churches from Trust Funds held by the Society.

CHARTERED INSTITUTE OF PATENT AGENTS.—In terms of the Register of Patent Agents' Rules, 1889-91, will be held next autumn a final qualifying examination of candidates for certificates entitling them to be entered in the Register of Patent Agents. The examination is open to pupils or assistants during seven consecutive years of registered patent agents, to solicitors of the Supreme Court of Judicature in England or Ireland, or law agents of the Court of Session in Scotland, and to persons who have passed certain preliminary examinations at our Universities, the entrance examinations for Woolwich or Sandhurst, the Civil Service Examinations for first-class clerkships, or for the Indian Civil Service, to Whitworth scholars or exhibitioners, Associates of King's College, London (Engineering and Science Department), to Bachelors of Science of Durham University, &c. The scientific portion of the examination extends to applied mechanics; electricity, chemistry, and heat; and mechanical drawing; and candidates will be examined in the law and practice relating to patents, trademarks, and designs, foreign patent law and practice, case law, the preparation and interpretation of specifications, and manufacturing processes.

THE NEW PUBLIC BUILDINGS.—In the House of Commons, on the 18th inst., Mr. Lewis asked the Secretary to the Treasury whether he could state the remuneration fixed by the agreements entered into with the architects for the new War Office, Whitehall, the new Public Offices, Westminster, and the Science and Art Buildings, South Kensington, and whether such remuneration had been fixed as a lump sum or by way of commission on the total cost; if so, at what rate per cent., and whether the commission was subject to variation in respect of additional, substituted, or abandoned works; and could he say who were the architects appointed under the agreements, and what was the amount of commission payable to each, assuming that the work was carried out on the present plan.—Mr. Austen Chamberlain: I am informed by my right hon. friend the First Commissioner of Works that the amounts in each case were fixed by agreements with the architects as follows:—For the new War Office, 23,750*l.*; for the new Public Offices, Westminster, 26,000*l.*; for the Science and Art Buildings, South Kensington—(*a*) Victoria and Albert Museum, 25,000*l.*, (*b*) Royal College of Science, 10,000*l*—total, 35,000*l.* These lump sums were arrived at by taking a percentage of 5 per cent. by way of commission on an agreed total estimated cost, and they are subject to variations as stated by the hon. member. If more details are desired the First Commissioner will be happy to show the agreements to any hon. members who may wish to see them. The architects were in each case respectively the late Mr. W. Young, the late Mr. J. M. Brydon, and Mr. Aston Webb, A.R.A.

THE RICHMOND HILL VIEW.—On Friday last week at the County Hall, Spring-gardens, a conference of representatives from the London, Surrey, and Middlesex County Councils, and various public bodies, was held to consider what steps could be taken to preserve from threatened disfigurements the view from Richmond Hill. Mr. A. Torrance, Chairman of the London County Council, presided. The proceedings were conducted in private. Eventually the following resolution was unanimously passed:—"That, in the opinion of this conference, it is vitally necessary that the view from Richmond Hill be preserved, and that with that object it is expedient that those present or invited to this meeting form a general committee, with power to add to their number, for the purpose of considering what steps are necessary and practicable to attain the object desired. The general committee to have power to appoint an executive committee to prepare a scheme and report."

WIDENING OF HAMPSTEAD-ROAD.—The St. Pancras Borough Council have agreed to contribute 28,125*l.* towards the cost of widening the southern end of Hampstead-road. The total cost will be 225,000*l.*

TAPE INDICATOR MAP OF LONDON.—Messrs. C. Smith & Son, of Charing Cross, have issued a new edition of their useful indicator which enables one to find any street on the map of London at once.

DICTIONARY OF THE WORLD'S PRESS.—Mr. Henry Sell's Dictionary of the World's Press for 1901 is the "coming of age" issue of a useful and well-arranged work. The present edition has been compiled with the care which has characterised previous issues. Besides apparently exhaustive lists of newspapers and magazines published in the British Isles, and lists of foreign and colonial papers, the Dictionary contains several articles of special interest to journalists and others. There are articles dealing with newspapers and journalism of the old and new centuries; journalism and the South African War; the Institute of Journalists; American railway advertising; tariff charges of the United States and Canada, &c., &c. The work contains many portraits of journalists, and the present issue, which numbers nearly 1,000 pages, has as a frontispiece a photograph of the late Queen.

DIRECTORY OF THE ENGINEERS' AND IRON AND METAL TRADES.—We have received from Kelly's Directories, Limited, the ninth edition of their excellently-arranged and clearly-printed Directory of the Engineers' and Iron and Metal Trades and Colliery Proprietors. It comprises, according to the interesting preface, complete lists of all the various trades connected with metal, or having any connexion with engineering. It includes places, grouped under their respective countries, in England, Ireland, Scotland, Wales, the Channel Islands, and the Isle of Man, with the names of persons carrying on business in each arranged alphabetically in counties or towns; lists of trades arranged alphabetically, in London and suburbs, England, Scotland, and Wales, and Ireland, and several useful indices. The Directory also includes useful facts as to population of places and early closing and market days, and the information it contains is, as far as we are able to tell, up to date and reliable.

PROPERTY SALES.—On Tuesday next, at the Mart, Avery Hill, Eltham, which was during many years the residence of the late Colonel J. T. North, popularly known as the "Nitrate King," for whom some extensive alterations, with enlargement, of the house were carried out under the superintendence of, as we read, Mr. T. W. Cutler. The interior of the house was fitted and decorated at a lavish expense. The principal apartments include a picture gallery and ballroom, a sculpture gallery, and a Turkish bath. There are also a winter garden 100 ft. square, a large fernery, and a stud-farm.——On Thursday next, New Grove House, in The Grove, Hampstead, formerly occupied by the late George Du Maurier, who, in 1894, removed thence to No. 17, Oxford-square, W., where he died on October 8, 1896; and the adjacent premises consisting of the Holly Bush tavern and the Hampstead Constitutional Club, which, with the large garden and the three adjoining cottages in The Grove, cover a building site of nearly 10,000 ft. superficial, with frontages to Holly-hill and Holly-mount. In October, 1796, George Romney, who first took lodgings at Hampstead in 1788, bought the copyhold of the old red-brick house on The Mount, in Heath-street. In 1799 he removed to some premises in the rear, which he had built for himself on Holly-hill, facing Holly-mount, comprising a large gallery for pictures and statues, at a cost of nearly 3,000*l.* In 1808, six years after Romney's death, his residence at Holly-hill was taken by the Committee of the Assembly, or New Subscription, Rooms. The premises, of Romney's time, now constitute the tavern and the clubrooms, the large timber-framed clubroom, upon a brick basement, being his studio or gallery, as converted for purposes of the assemblies; the parlour, kitchen, and offices of the club were, it seems, added about eighty-five years ago, by means of a tontine for an enlargement of the Assembly Rooms. We published a view of the tavern and the club premises in our number of July 23, 1898.

FIRE PREVENTION.—Count Kamarowsky, President of the International Fire Council, which held its Congress at Berlin last month, is now on a visit to London. The International Council proposes to form a Technical Research Committee on the Continent, with objects not unlike those of the British Fire Prevention Committee, and it was with the view of deciding on the preliminary arrangements that Count Kamarowsky made a careful inspection of the London Committee's Testing Station, and several public buildings in which fire preventive measures have been applied. Facilities were also accorded him to view the stations of the Metropolitan Fire Brigade and the London Salvage Corps.

TESTIMONIAL TO A BOROUGH SURVEYOR.—As a result of the London Government Act, 1899, the District Board of Works Office at Putney has been abolished, and the Council of the new Borough of Wandsworth have awarded the former surveyor, Mr. J. C. Radford, a liberal retiring allowance which he takes with him into private practice, after twenty-five years' public service. The ratepayers of Putney have also subscribed for a valuable service of plate to be presented to Mr. Radford.

ARBITRATION CASE.—The award of the arbitrators has been made in respect of work done in the erection of a house in Vernon-road, Edgbaston, by Hiram Willcox, late of Bradford-street, builder, for Mr. Charles Sharp Smith, architect, of Cannon-street. The work was done under contract on an estimate based on quantities supplied by the architect, who measured up the variations and claimed a balance of 66*l.* 0s. 10d. in his own favour, based on a claim for penalty for alleged delay and other matters. The builder's statement on a valuation by his surveyor showed a balance due to him of 258*l.* 16*s.* 8d. The arbitrators, who awarded 227*l.* as due to Mr. Willcox, were Messrs. Anthony Rowse and J. Kirkham Dale. Mr. O'Connor appeared as solicitor for Mr. Willcox, and Mr. Tanner for Mr. Sharp Smith.—*Birmingham Daily Gazette.*

CAPITAL AND LABOUR.

THE PENRHYN QUARRY.—As has already been stated, the Penrhyn Quarry was reopened on the 11th ult. with something under 600 men, or rather less than a quarter of the usual number. The output during the first quarry month (four weeks) was over 2,000 tons of slates, and every week, we are informed, some fresh men and boys resume work, about eighty having gone in during the past six weeks. The workmen now employed held their first meeting on pay Saturday, the 20th inst., and passed the following resolution:—"We, the workmen in the Penrhyn Quarry, wish to tender our hearty thanks to Lord Penrhyn for the generous bonus of 5 per cent. given to us this month in addition to the 5 per cent. rise given to us voluntarily by Lord Penryhn in January, 1896. We also avail ourselves of this opportunity to acknowledge gratefully the constant kindness of his Lordship towards us as workmen and neighbours at all times, but especially in time of sickness and distress. Yet more do we wish to place on record our warmest thanks for the relief the funds of our Benefit Club have had by his Lordship generously taking upon himself the expenses of the hospital and the doctor's salary. Also for the help given in a quiet and unobtrusive way to the sick during their convalescence by sending them to and bearing their expenses in convalescent homes, and for other gifts we know of well enough. . . ." The above resolution has been acknowledged by Lord Penrhyn's chief agent.

SETTLEMENT OF A LEEDS BUILDING TRADE DISPUTE.—A little more than six months ago the slaters and slaters' labourers in Leeds sent in an application to the employers for an advance of wages and an alteration of rules, to date from July 1. The district officials of the Gasworkers' and General Labourers' Union met the employers a few evenings ago and reported the result of their interview to a meeting of men on the 19th inst. The slaters' labourers did not seem very pleased, and it was only after a long discussion, in the course of which it was pointed out that the masters had consented to fix the minimum wage for this kind of labour at 6½d. per hour, that the meeting passed a resolution not to strike.—*Yorkshire Post.*

TEES-SIDE BRICKLAYERS.—A ballot of the members of the Tees-side and District Master Builders' Association was taken a few days ago in regard to the Hartlepool bricklayers' dispute, when it was decided to lock out all bricklayers working on Tees-side. At a subsequent meeting, however, it was agreed to defer the lock-out for a week so that a conference might be arranged with the men's executive.

LEGAL.

SOUTHWARK BUILDING DISPUTE.

THE case of Davis *v.* Gibbs and another came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Vaughan Williams and Stirling, on the 22nd inst., on the appeal of the defendants in the action from an order of Mr. Justice Bucknill in chambers obtained by the plaintiff giving him leave to sign summary judgment under Order XIV.

Mr. Bassett Hopkins appeared for the appellants (defendants), and Mr. Norman Craig for the respondent (plaintiff).

It appeared from the statement of Mr. Bassett Hopkins that the plaintiff was the trustee in the bankruptcy of a builder named Ham, and he claimed 744*l.*, the balance certified as due by the architect under a building contract for work and labour done at the Gibraltar public-house, St. George's-road, Southwark. The defence, which was in the nature

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of a counter claim, was that, under the agreement, if the work was not completed by a given day a penalty of 10*l.* a week was to be paid by the builder until the work was completed. The work, by the contract, was to have been finished in twenty-two weeks from its commencement in September, 1899, namely, in February, 1900, whereas the final certificate of the architect was not given until March, 1901, so that the delay had gone into over a year. The Master had given the defendants leave to defend the action if they brought the whole amount of the claim into Court. Mr. Justice Bucknill, however, varied the order, and leave to defend was given if 450*l.* was brought into Court. The learned counsel contended that the defendants were entitled in the circumstances to unconditional leave to defend. The business had to be carried on by the publicans during the whole time that the house was being rebuilt, and that, apart from the liquidated damages for delay and inconvenience, they had also suffered a very great loss to business from the time the work had been about. He submitted, therefore, that there was a distinct cause of action raised by the counter claim, apart from the question of liquidated damages, and that unconditional leave to defend ought to be given.

The Master of the Rolls asked the cause of the delay.

Mr. Bassett Hopkins said that his witnesses attributed it in no small measure to the impecuniosity of the builder. The publicans had faithfully paid as and when the architect gave his certificates.

The Master of the Rolls: It seems that you have made out a good case. These were licensed premises, and I can very well understand that the publicans suffered damage far in excess of 10*l.* a week.

Mr. Norman Craig, for the plaintiff, said that there was no defence that the sum claimed was due. What the defendants said was that their counter-claim came to more than the claim, but, extra work having been ordered, the penalty clause for non-completion by a certain date became void.

Lord Justice Vaughan Williams asked the learned counsel what evidence he had of extra work having been ordered.

Mr. Norman Craig read an affidavit by the builder to the effect that he could not get on with the work for several days, owing to the defendants not having obtained the necessary sanction of the ocal Authority.

The Master of the Rolls: Even supposing that the statements in the affidavit were proved at the trial, the defendants would still be entitled to damages sustained to their trade. Besides, there is nothing there about extra work being ordered.

Mr. Norman Craig said that if the contract had not been a good one, the Receiver would never have brought the action, for it would have been a loss instead of a gain to the estate. If the counter-claim were not struck out, the result of it would be that the builder had done some 744*l.* worth of work on the public-house, and the damages for non-completion would wipe out the bill—and more, possibly.

In the result the Master of the Rolls, in giving judgment, said that the appeal must be allowed. In his opinion, having regard to the fact that the premises were licensed premises and business was being carried on during all the time the rebuilding was in process, there was a substantial and not a nebulous defence. He thought the defendants were entitled to unconditional leave to defend. The order appealed against would therefore be set aside and the issue go to trial in the ordinary way.

The Lords Justices concurred.

Order accordingly.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

5,617.—A BOILER FOR HOT-WATER APPARATUS: *G. Newsum and F. Newsum.*—The boiler, which is adapted for apparatus for heating buildings, has a waggon-shaped and corrugated fire-box with an arched crown; a hopper serves for the introduction of fuel, and openings are provided for the escape of the products of combustion.

5,632.—CONTRIVANCES FOR USE IN ROOF-GLAZING: *R. White.*—The lower edges of the glass sheets are supported at the ends of the bars with clips or stop pieces fashioned out of metal rods, strips, or wires bent crosswise around the bars and fastened with bolts, or the ends of the rods and wires may be bent or twisted through holes in the bars; in one shape a bolt beneath the bar clips a flanged stop-plate to the notched end of the bar, the plate being provided with drainage holes.

5,659.—MANUFACTURE OF CEMENTS, CONCRETES, &C.: *W. Wright.*—The inventor seeks to furnish means of improving the setting and working properties of Portland, Roman, and other cements with concretes and artificial stone compounds, particularly those that contain chalk, which are made up in the shapes of paving bricks and slabs, window-sills, and similar goods. In preparing the cement he mixes carbonate of potash or some other alkali with the water, or combines sulphur with a strong alkali, and after the material has become set he hardens it with sulphuric acid.

5,664.—METAL COLUMNS: *R. Rau.*—For enhancing the strength of long columns and for ornamenting their exterior a sheath is cast around a tubular wrought-iron core and is left to form part of the finished column; water, or saturated steam or air, is circulated through the core in order that it may not become too heated, and its temperature may then be increased, before the process of casting, by the admission of hot air or superheated steam.

5,670.—FEED MECHANISM FOR CIRCULAR SAWS: *N. Tailby.*—In this contrivance, which constitutes an improvement of the mechanism specified in No. 24,807 of 1896, upon the axis of the main roller is pivoted an auxiliary arm, at the end of which is mounted a supplementary roller which a weight, hanging from a cord, forces against the wood, whilst the roller presses the wood upon the fence between the saw and the main feed-roller so as to serve especially for the sawing of short lengths of wood.

5,671.—AN APPLIANCE FOR USE WITH LADDERS: *A. Warburton.*—At the top of the ladder is affixed a tray or shelf for holding tools, &c., by means of side rods sliding in guides, the notched and flanged end of each rod will engage with another eye-piece or guide at the back of the ladder.

5,700.—EARTH-CLOSET APPARATUS: *M. F. Adams.*—It is contrived that the casing, which should be made of sheet iron, shall further serve as a receptacle. A handle works the earth-box, which is placed under and behind the seat.

5,704.—A FASTENING FOR SCAFFOLD-POLES, &C.: *F. Seabourne.*—For fastening the poles together in a line or angle-wise the inventor has devised U-shaped bolts or straps, which he inserts through holes cut in a squared plate and tightens with nuts when they have been put over the poles.

5,706.—A CIRCULAR-SAW GUARD: *R. Halkes.*—The front and back of the saw are covered with two shields that are hinged on to a socket mounted upon the squared end of a bracket. A slotted stay sustains the front shield so that the wood may pass freely beneath it, whilst the wood as it is passed forwards will raise the back shield. A collar in which is clamped the vertical portion of the bracket holds up the bracket for being turned (with a set-screw) in a bearing which is secured with bolts to the back of the bench, and so one can swing the shields away from the saw.

5,710.—AN ELECTRICAL CURRENT METER: *P. J. S. Tiddeman.*—For indicating the extent of exhaustion of the separate cells of a storage battery, each of them is connected with a fuse to a separate electro-magnet which under normal conditions will sustain an armature lever, but will allow the lever to fall should the cell pressure be reduced to less than any limit required, each of the levers being either hinged below the corresponding electro-magnet or suspended from a pivot. Numbered openings in a front plate register with the several indicating plates of the levers, and each lever may be caused to close the circuit of an electric bell by means of contact with a stop.

5,725.—A HINGE FOR SLIDING WINDOW SASHES: *G. H. Parker.*—The hinge, which is intended for temporary use when it is desired to swing the sash inwards, comprises two discs that are mounted upon a rod and two other discs that will turn freely upon the rod. To both the top and bottom of the sash are secured a pair of headed pins, and another pair are secured to the jamb of the window; the dovetailed slots of the discs mounted upon the rod take the heads of the pins so that after the removal of the stop-bead upon the opposite side one can turn the sash about the rod.

5,743.—APPARATUS FOR FIRE ALARMS: *E. H. Griffiths, W. C. D. Whetham, and Cambridge Sentinel Manufacturing Company.*—In order to indicate when a certain limit of temperature has been reached, a container is filled with fusible metal, or alloy, or some similar material, which will melt when the limit of temperature is attained, whilst by means of the action of a spring or gravity the alloy is caused to close an electrical circuit for the sounding of a bell alarm, and so on. In one modification a glass or some other insulating piece which is supported by a weighted metal arm reposes upon the alloy that is laid within a metal cup; in another form the alloy is laid in a tube which is inclined at its base and can be turned upon a lug for purposes of resetting; the alloy, as it melts, effects contact with an insulated wire that is inserted through an insulating plug at the upper end of the tube.

5,747.—A CONTRIVANCE FOR USE WITH DRAWING COMPASSES: *E. T. Boden.*—The insertions or removable points of half-sets of mathematical compasses are adjusted and secured by means of a slotted flat piece which is fixed between the sides or jaws of a grooved arm; grooves are made in the flattened ends of the insertion pieces and will correspond with the solid portions of the strips which have grooves that will fit over the solid flattened portions of the removable points; in some cases the entire shank of the pin-point may be flattened.

5,755.—AN ELECTRICAL INSULATING MATERIAL: *C. Jung, A. Brecher, and A. Kittel.*—Castor, rape, or linseed oil is mixed and kneaded with casein; sulphur may be added, and gutta-percha or some other suitable substance is then added to the mixture.

5,758.—A CIRCULAR SAW: *G. Schlegelmilch and F. A. Mann.*—The main shaft will drive a chain placed in gear with the teeth of a chain-wheel on to which the saw—which has internal teeth—is bolted, and a screw controls the fall of a radial arm upon which the saw is mounted; provision is made for holding the work angle-wise, and several saws with distance-pieces can be clamped together when it is required to cut off an amount of short pieces.

5,768.—TRIPOD STANDS: *A. H. Dupeyron.*—The tubular legs of a telescopical stand are hinged on to the top, and when they have been extended, two projections which a spring presses into apertures in one section will fasten that section to the next one, the inclined edge of one of the projections will be pressed inwards as the upper section is forced down upon it, so that the leg can be shut up by only pressing inwards the catch of the top section; a disc that may have a ball-and-socket joint on the top of the tripod has a screw at its centre on to which the instrument is secured.

5,790.—APPLIANCE FOR TESTING DRAINS: *F. Barrow.*—The bell-cover works within an annular chamber formed by the concentrical walls of a combustion chamber, and, as it is being worked, air will be admitted through a pipe inlet fitted with non-return valves, and, being charged with the smoke of a combustible laid upon the grating, passes away through the outlet into which is screwed a short length fitted with a non-return valve and a pressure gauge.

5,791.—A FASTENER FOR WINDOWS, &C.: *E. F. How and H. King* (*F. Hill & Co.*).—For holding fanlights and ventilation hoppers at an angle, the inventors mount the fanlight upon the pins of arms that are worked with screws in such a manner that one can withdraw the pins from engagement if it is desired to remove the fanlight. Spring catches upon the fanlight engage with holes or recesses cut in the quadrants, and a catch at the top of the fanlight will retain it when closed. For a fanlight having butt-hinges the side catches are placed near its top, and the sash can be lowered (for purposes of cleaning it) beyond the quadrants by turning the nut or turn-buckle which fastens the pivoted flange of each hopper or quadrant.

5,829.—MANUFACTURE OF ARTIFICIAL STONE: *F. F. de Naeyer.*—Small quantities of powdered asphalt or tar, or concentrated gas tar mixed with pulverised coal-cinders, together with sulphate and aluminate of soda, are mixed up with dry sand and cement or lime, and there may be added an admixture of quicklime and powdered coal-cinders. The moulds containing the compound are treated with boiling water, and then with super-heated steam at a pressure of six or seven atmospheres.

5,843.—BRICKS AND BLOCKS FOR BUILDERS' USE: *W. Wright.*—The blocks and bricks are fashioned with plain, ornamented, coloured, or glazed tile faces. In the case of outside work the faces may be weathered or inclined, and the faced bricks may be made in the shape of ornamental weather tiles.

5,852.—A CONTRIVANCE FOR CLOSET-SEATS: *H. H. Green.*—In order to provide adjustment for different heights and the unevenness of the floor-level, the inventor devises screw feet for the brackets or standards that support the seat.

6,073.—A DISCONNECTIBLE COUPLING FOR FLUSHING-PIPES: *E. H. Burgess.*—Flushing-pipes are connected to the horns of closet-basins with an indiarubber ring set in a rounded flange that is pressed against the horn by a screwed sleeve, which is made fast with a set-screw, and is fitted upon a ring which is attached to the inlet-pipe.

MEETINGS.

SATURDAY, JULY 27.

Builders' Foremen's Association (Memorial Hall, Farringdon-street).—Quarterly meeting. 7.30 p.m.

MONDAY, JULY 29.

Institution of Junior Engineers.—Visit to Electric Lighting and Tramway Installation of the East Ham District Council, Nelson-street, East Ham. 6.30 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 6.—By G. S. ANDREWS (at Norwich).

Old Buckenham, Norfolk.—The Hall Farm, 232 a. 0 r. 26 p., f. and c.	£3,800

July 10.—By W. R. NICHOLAS & Co. (at Hereford).

Cusop, Hereford.—Tycoch Farm, 159 a. 0 r. 36 p., f.	2,400

July 11.—By BIDWELL & SONS (at Ely).

Hilgay, Norfolk.—Beaton's Old Farm, 595 a. 2 r. 3 p., f.	8,025
Southery, Norfolk.—Brandon Creek Farm, 150 a. 3 r. 35 p., f.	3,700

July 12.—By Messrs. COBB (at Sittingbourne).

Lynsted, Kent.—Monk's Farm, 30 a. 1 r. 13 p., f.	840
Boyle Farmhouse and 17 a. 1 r. 13 p., f.	1,900
A freehold orchard and two cottages, 5 a. 2 r. 38 p.	1,250
Three freehold cottages and 0 a. 2 r. 11 p.	320
School House Field, 5 a. 3 r. 11 p., f.	450
Milsted Field, 4 a. 0 r. 34 p., f.	420
Races Orchard, 1 a. 1 r. 30 p., f.	400
Cellar Hill House and 4 a. 2 r. 16 p., f.	1,700
Nailbourne Cherry Orchard, 13 a. 1 r. 9 p., f.	3,650
Newhouse Farm, 123 a. 3 r. 38 p., f.	8,200
Blacklands Enclosure, 14 a. 0 r. 9 p., f.	735
Tickham Farm, 46 a. 2 r. 3 p. f.	3,200
Four cottages and 0 a. 0 r. 30 p., f.	375
Seward's Farm, 148 a. 2 r. 1 p., f.	7,700

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Lynsted-street Orchard, 3 a. 2 r. 6 p., f. £1,225
Old Park Enclosure, 13 a. 2 r. 6 p., f. 840
Two houses and shops, six cottages, and 2 a. 0 r. 29 p., f. 1,485

By MILLAR, SON, & Co.

Harrow, Middlesex.—1 and 3, Northwick-villas, u.t. 50 yrs., g.r. 12*l.* 310
Marlborough-rd., a freehold stable, r. 20*l.* 435
Marlborough-hill, 17 plots of building land, f... 1,990
Marlborough-hill, f.g.r. 20*l.*, reversion in 69 yrs. 505

By PHYSICK & Co.

Marylebone.—1, 1a, 2, and 2a, William-st., u.t. 77½ yrs., g.r. 66*l.* 13*s.* 4*d.* 3,050
Chelsea.—85 and 86, Oakley-st., u.t. 65 yrs., g.r. 21*l.* 10*s.*, r. 130*l.* 1,160
Kilburn.—Carlton-vale, three freehold building plots 300

By R. PRICE & SON.

Wandsworth.—12, Dent's-rd., u.t. 79 yrs., g.r. 7*l.* 16*s.*, r. 48*l.* 410

By TRAFFORD & CARTER.

Plaistow.—47, Whitwell-rd., f. 245
Southwark.—48, Pardoner-st., f. 725
Bethnal Green.—25 and 27, Palm-st., u.t. 31 yrs., g.r. 6*l.* 6*s.* 385
Victoria Park.—375, 377, and 379, Victoria Park-rd., u.t. 36 yrs., g.r. 6*l.*, r. 90*l.* 760

By WINDRAM & CLEAVE.

Plaistow.—7 to 17 (odd), Abbey rd., part f. and part u.t. 61 yrs., g.r. 8*l.* 690
Poplar.—58 to 72 (even), Guildford-rd., u.t. 52 yrs., g.r. 85*l.* 4*s.* 1,360
Stratford.—1 to 7 (odd), Marcus-st., u.t. 72 yrs., g.r. 12*l.* 500

By HUSSEY & SON (at Exeter).

Brampford Speke, Devon.—Chamberlain's Farm, 43 a. 2 r. 21 p., f. 2,000
Camel Plot Field, 3 a. 2 r. 34 p., f. 125
Broad Park, &c., Closes, 11 a. 2 r. 1 p., f. 347
Long and French Moor Orchards, 4 a. 2 r. 5 p., f. 166

By SCOBELL & LAKE (at Felixstowe).

Felixstowe, Suffolk.—12 and 13, Manor-ter., u.t. 75 yrs., g.r. 3*l.*, r. 50*l.* 590

By BEADEL, WOOD, & Co. (at Diss).

Hinderclay, Suffolk.—Five enclosures, 32 a. 1 r. 17 p., f. 280
Enclosures of land, 24 a. 2 r. 33 p., f. 260

By MORRIS, MARSHALL, & POOLE (at Bishops Castle).

Whitcott Keysett, Salop.—A freehold farm, 42 a. 2 r. 17 p. (in lots) 2,805

July 13.—By S. WALKER & SON (at Guildford).

Guildford, Surrey.—Waterden-rd., Waterden, with builder's yard and premises in rear, f 1,200

By BIDWELL & SONS (at Norwich).

Burgh, Norfolk.—The Burgh Hall Estate, 475 a. 2 r. 18 p., f. 10,750

By SEWELL & BARNES (at Norwich).

Tivetshall St. Margaret, Norfolk.—Farmhouse and 55 a. 1 r. 2 p., f. and c. 750
Pulham St. Mary the Virgin, Norfolk.—A freehold farm, 64 a. 1 r. 4 p. 110
Carleton Rode, &c., Norfolk.—Farmhouse and 34 a. 3 r. 16 p., part f. and part u.t. 665 yrs., g.r. nil 600

By HOOKER & WEBB (at Warlingham).

Upper Warlingham, Surrey.—Main-rd., a plot of building land, 0 a. 3 r. 8 p., f. 220
Main-rd., three plots of building land, f. 395
Mark's-rd., fifteen plots of building land, f. 889
Eglise-rd., Glen View, f., r. 40*l.* 800
Main-rd., five freehold meadows, 7 a. 1 r. 29 p. 1,182
Whyteleafe, Surrey.—Godstone-rd., a corner building site, f. 320

By H. DUKE & SON (at Dorchester).

Winterbourne St. Martin, Dorset.—Ashton Estate, 640 a. 1 r. 39 p., f. 7,550

July 15.—By J. H. BETHELL.

Hackney.—176 to 182 (even), Well-st., u.t. 41½ yrs., g.r. 5*l.*, r. 166*l.* 8*s.* 2,250
218, Well-st., u.t. 43¾ yrs., g.r. 6*l.* 10*s.*, r. 65*l.* .. 860
Upton Park.—212, Gipsy-lane, u.t. 77 yrs., g.r. 6*l.*, r. 36*l.* 385

By BROWETT & TAYLOR.

Sydenham.—Sydenham-rd., The Grange and Hanover Lodge, area 5 a., f. 4,850
Bow.—147, Bow-rd., u.t. 28 yrs., g.r. 8*l.*, e.r. 90*l.* 700

By ELLIS & SON.

Great Tower-st.—3 and 4, Water-lane, and 5 and 6, Fowkes-buildings, u.t. 73 yrs., g.r. 370*l.*, e.r. 2,000*l.* 9,950

By FIELD & SONS.

Lambeth.—2, 3, 4, and 5, Lanfranc-st., f. 1,210
37 and 38, Lanfranc-st., f. 655
7 to 11, Burdett-st., f. 1,260
31 to 38, Murphy-st., f. 1,380
Rotherhithe.—32 to 62 (even), Fawcett-rd., f. 6,000

By G. B. HILLIARD & SON.

Rochford, Essex.—Gusted Hall Estate, 221 a. 3 r. 13 p., f. 2,600
Walbasea Island, Essex.—The Barn Farm, 223 a. 0 r. 39 p., f. 1,000
Tillett Marsh Farm, 229 a. 3 r. 6 p., f. 620

By MILLAR, SON, & Co.

Holloway.—1, 3, 5, and 7, Miranda-rd., u.t. 53 yrs., g.r. 40*l.*, r. 143*l.* 805
2 to 32 (even), Miranda-rd., u.t 53 yrs., g.r. 160*l.*, r. 596*l.* 4,355
2, 4, 6, and 8, Lysander-gve, u.t. 49 yrs, g.r. 35*l.* 10*s.*, r. 152*l.* 1,120
354 and 356, Camden-rd., u.t. 41 yrs., g.r. 12*l.*, r. 145*l.* 1,200
366, Camden-rd., u.t. 41 yrs., g.r. 20*l.*, r. 75*l.* .. 375
372, 374, 378, 380, and 382, Camden-rd., u.t. 41 yrs., g.r. 100*l.*, r. 330*l.* 1,815

By A. SAVILL & SON.

Tottenham.—1 to 6, Fountain-pl., also three cottages in Station-rd, and timber yard and land, total area 1 a. 3 r. 20p., f. 3,000
Abbotts Roothing, Essex.—Leader's Farm, 42 a. 2 r. 7p., f. 450
Abbott's Field, 3 a. 3 r. 10 p., f. 150

By WHITE, BERRY, & TAYLOR.

Belgravia.—45, Grosvenor-pl., and 45, Dorset-mews, u.t. 39½ yrs., g.r. 2*s.* 8,800

By HENRY HENDRIKS (at Birmingham).

Stirchley, Worcester.—The Mossberg Works, area 10,186 yds., f. 3,150

By FENN & Co. (at Clacton).

Little Clacton, Essex.—Shelley Lodge Farm, 59 a. 0 r. 8 p., f. and c. £710

By FRANKLIN & JONES (at Reading).

Watlington, Oxon.—A freehold farmhouse, residence, and 222 a. 2 r. 21 p. 2,650

By GRIFFITHS & CHENNELL (at Newmarket).

Newmarket, Suffolk.—Langrange House and 6 acres, f. 10,000
Snailwell-rd., a building plot, f. 760
Exning, Suffolk.—6 and 8, Heathside, f., r. 31*l.* 4*s.* 500
Stetchworth, Cambs.—A copyhold paddock, 2 acres 140

July 16.—By DAVID BURNETT & Co.

Brixton.—6 and 8, Hayter-rd., u.t. 66 yrs., g.r. 20*l.*, e.r. 100*l.* 760
Brompton.—1, North-ter., u.t. 5 yrs., g.r. 8*l.*, e.r. 65*l.* 100

By C. RAWLEY CROSS & Co.

Shepherd's Bush.—16, Askew-rd., u.t. 62 yrs., g.r. 6*l.*, e.r. 45*l.* 475
69, Lawn-pl., u.t. 91 yrs., g.r. 10*l.*, e.r. 70*l.* 785
8, Hetley-rd., f., r. 42*l.* 680
Acton.—2 to 20 (even), Southfields-rd., u.t. 97 yrs., g.r. 50*l.* 2,500
Hildenborough, Kent.—Selby's Farm, 55 a. 2 r. 1 p., f. 2,500

By DEBENHAM, TEWSON, & Co.

St. Pancras.—77 and 79, Charrington-st., u.t. 43 yrs., g.r. 12*l.*, r. 100*l.* 950
Glen Cottage and 3 a. 1 r. 8 p., f., r. 14*l.* 250

By FARADAY & RODGERS.

Waddon, Surrey.—Godson-rd., f.g.r. 14*l.*, reversion in 98 yrs. 350
Plumstead, Kent.—Bannockburn-rd., f.g.r. 5*l.*, reversion in 95½ yrs. 125
Camden Town.—37, Rochester-rd., u.t. 42¾ yrs., g.r. 5*l.*, r. 40*l.* 360

By F. MILLER & REID.

Balham.—115, Ramsden-rd., u.t. 67 yrs., g.r. 5*l.* 12*s.* 6*d.*, e.r. 32*l.* 245

By MORGAN, BAINES, & CLARK.

Sutton, Surrey.—Robinhood-lane, Westness, f. .. 1,600

By PHILIP STOCK.

Brixton.—366, Coldharbour-lane, u.t. 40 yrs., g.r. 9*l.* 11*s.*, r. 45*l.* 445
63, Geneva-rd., u.t. 65 yrs., g.r. 6*l.*, r. 36*l.* 360

By A. H. TURNER & Co.

Woodspeen, Berks.—The Lee and 4 a. 2 r. 26 p., f. 1,425

By FRED. WARMAN.

Bedford-row.—11, John-st., f., e.r. 200*l.* 4,000
Regent's Park.—161 and 163, Gloucester-rd., u.t. 61 yrs., g.r. 20*l.*, r. 100*l.* 1,005

By S. WALKER & SON.

Winchmore Hill.—8, Park-villas, u.t. 78 yrs., g.r. 9*l.*, r. 60*l.* 570
Herne Hill.—11, Deronda-rd., u.t. 57 yrs., g.r. 8*l.* 8*s.*, e.r. 45*l.* 325

By WM. WESTON.

Fulham.—74, Shorrold's-rd., f., r. 32*l.* 425

By T. G. WHARTON.

East Ham.—Halley-rd., f.g.r.'s 100*l.*, reversion in 98 yrs. 2,350
Fulham.—Mablethorpe-rd., f.g.r.'s 38*l.* 10*s.*, reversion in 96 yrs. 940
Bronsart-rd., f.g.r.'s 31*l.*, reversion in 96 yrs... 775

By WALTON & LEE (at Newcastle).

Doxford, Northumberland.—The Doxford Hall Estate, 609 a. 0 r. 6 p., f. 32,200

By S. MEALING MILLS (at Norwich).

Norwich.—St. Giles-st., The Norfolk Hotel, area 21,060 ft., f. 6,800

By ROBERTS, SON & TORY (at Yetminster).

Yetminster, Dorset.—Enclosures of land, 39 a. 1 r. 32 p., f. and c. 1,330

By S. & G. KINGSTON (at Spalding).

Surfleet, Lincs.—Enclosures of land, 13 a. 3 r. 3 p., f. 750
Gosberton, Lincs.—Two enclosures, 16 a. 3 r. 23 p., f. 855
Fleet, Lincs.—Freehold messuage and 48 a. 0 r. 32 p. 2,000

By WM. ROLFE (at Masons' Hall Tavern).

Bermondsey.—Alscott-rd., The Prince Alfred p.-h., u.t. 17½ yrs., r. 100*l.*, with goodwill 2,500
Southwark.—Lant-st., The Crown p.-h., f., with goodwill 1,250

July 17.—By FRANCIS DOD & Co.

Harringay.—71 and 73, Wightman-rd., u.t. 91 yrs., g.r. 14*l.* 14*s.*, e.r. 90*l.* 800
Stoke Newington.—60, 62, and 66, Spencer-rd., u.t. 57 yrs., g.r. 9*l.* 640
12, Park-lane, u.t. 65½ yrs., g.r. 12*l.*, r. 52*l.* 10*s.* 420

By FERRIS & PUCKRIDGE.

Whitchurch, Devon.—A freehold rent-charge of 259*l.* 11*s.* 8*d.* 2,975

By P. & G. GREEN.

Cheshunt, Herts.—Church Path, Ryston and St. Claire, r. 62*l.*, also l.g.r. 2*l.*, u.t. 95 yrs., g.r. 6*l.* 600

By HAROLD GRIFFIN.

Battersea.—10, Musjid-rd., u.t. 76 yrs., g.r. 5*l.* .. 260
38, Granfield-st., u.t. 65 yrs., g.r. 4*l.* 5*s.* 250
Wandsworth.—6, Oberstein-rd., f., r. 35*l.* 550
4, 5, and 6, Brussels-rd., f., r. 110*l.* 1,670
Battersea.—22, 24, 30, 32, 56, 58, and 64, Shillington-st., u.t. 58 yrs., g.r. 32*l.* 1,365
29, Shillington-st., u.t. 58 yrs., g.r. 4*l.* 215
35, Shillington-st., with yard and buildings in rear, u.t. 58 yrs., g.r. 6*l.* 300
53 and 55, Este-rd., u.t. 58 yrs., g.r. 8*l.* 430

By HENRY HOOPER.

Peckham.—181, Choumert-rd., f. 455
Caledonian-rd.—24, Edward-sq., u.t. 39 yrs., g.r. 5*l.* 260
Teddington.—Hampton-rd., St. Helier's, f., r. 90*l.* 1,175

By HUMBERT & FLINT.

South Mimms, Middx.—Nightingale Cottage, f., r. 80*l.* 1,405

By G. B. SMALLPEICE & Co.

Stratford.—Station-st., f.g.r. 28*l.*, reversion in 68¾ yrs. 695
84, Station-st., f., r. 16*l.* 200
Stratford.—High-st., &c., l.g.r.'s 1,074*l.*, u.t. 62½ yrs., g.r. 606*l.* 5,000
Martin-st., &c., i.g.r.'s 815*l.* 11*s.*, u.t. 56 yrs., g.r. 220*l.*; also Station-st. f.g.r. 42*l.*, reversion in 56 yrs. 7,000

By THURGOOD & MARTIN.

Fleet-st.—Red Lion-court, Red Lion House, u.t. 28 yrs., g.r. 10*l.*, r. 200*l.* 2,200
Beckenham.—19 and 21, Wickham-rd., f., r. 38*l.* £700
South Kensington.—8, Wetherby-mews, u.t. 72 yrs., g.r. 12*l.*, e.r. 65*l.* 450

By Messrs. SPELMAN (at Norwich).

Norwich.—Chapel-la., seven freehold cottages .. 575
Chapel-la., nine freehold houses 1,350
Chapel-la., a piece of garden ground, f. 120
91, 93, 94, and 96, Lawson-rd., f. 550
Unthank-rd., &c., nine freehold building sites.. 900

By BELCHER, ADKIN, & BELCHER (at Wantage).

Childrey, Berks.—Burson's Farm, 71 a. 2 r. 31 p., f. 2,600
Enclosures of land, 21 a. 2 r. 23 p., f. 1,018
Two freehold cottages 250
Straightway and Whiting's Pieces, 24 a. 2 r. 15 p., f. 665
Field Barn Farm, 111 a. 3 r. 4 p., f. 1,600

By WATERS & RAWLENCE (at Trowbridge).

Trowbridge, Wilts.—Closes of land with buildings thereon, 20 a. 0 r. 22 p., f. 1,500
Holbrook Farm, 106 a. 2 r. 18 p., f. 4,500
Cockhill Brick and Tile Works, 5 a. 3 r. 2 p., f. 500
Enclosures of building land, 5 a. 1 r. 36 p., f... 590
Various enclosures of land, 38 a. 1 r. 15 p., f. .. 3,230
Westwood, Wilts.—Plot of woodland, 4 a. 0 r. 4 p., f. 120

July 18.—By BEARD & SON.

Edgware-rd.—26, 30, 32, and 34, Church-st., u.t. 20½ yrs., g.r. 40*l.*, r. 220*l.* 1,580

By DEBENHAM, TEWSON, & Co.

Clapton.—141, Upper Clapton-rd., u.t. 37 yrs., g.r. 20*l.* 1,050

By FAREBROTHER, ELLIS, & Co.

Regent's Pk.—28, Cumberland-ter., and 28, Cumberland-ter.-mews, u.t. 24 yrs., g.r. 52*l.* 10*s.* 650

By LEVENS, SON, & HOARE.

Shortlands, Kent.—Scott's-lane, a freehold site .. 350

By MONTAGU & ROBINSON.

Islington.—53, 55, and 57, Essex-rd., and 7 and 9, Church-lane, f., r. 186*l.* 10*s.*; also f.g.r. 5*l.*, and a peppercorn g.r., reversion in 25 yrs..... 3,300

By C. C. & T. MOORE.

St. George's East.—57, Cable-st., c. 525
Western-passage, f.g.r. 6*l.*, reversion in 43 yrs.. 125
Commercial-rd. East.—40 to 48 (even), Morgan-st., f. 2,050
45, 47, 49, and 51, Morgan-st., f. 1,995
St. George's East.—14 and 20, Umberston-st., f... 710
7 and 9, Grove-st., f. 1,300
Commercial-rd. East.—2 and 4, Philip-st., and 9 and 11, Pinchin-st., f. 1,385
Mile End.—116 and 118, Buxton-st., and 2 and 3, Buttress-st., f. 1,160
44 to 58 (even), Newark-st., u.t. 5½ yrs., g.r. 14*l.* 19*s.* 510
82 to 110 (even), Bedford-st., u.t. 9½ yrs., g.r. 18*l.* 700
10 to 20 (even), Morgan-st.; 35, 35A, and 37, Coborn-rd., u.t. 45 yrs., g.r. 80*l.* 2,000
27 to 41 (odd), Morgan-st., u.t. 45 yrs., g.r. 80*l.* 1,300
Bromley-by-Bow.—20 to 23, Morris-rd., u.t. 74 yrs., g.r. 16*l.* 16*s.* 1,000
Mile End.—56, Lichfield-rd., u.t. 41 yrs. g.r. 3*l.* 10*s.* 325
Leyton.—17, Beaconsfield-rd., f., r. 38*l.* 315
Beaconsfield-rd., f.g.r. 12*l.*, reversion in 77 yrs. 300

By NEWBON, EDWARDS, & SHEPHARD.

Smithfield.—78, St. John-st., f., e.r. 250*l.* 1,725
Holloway.—Rock-st., i.g.r. 37*l.* 16*s.*, u.t. 70 yrs., g.r. 12*l.* 1,010
Upper Tollington-rd., i.g.r. 58*l.* 10*s.*, u.t. 41½ yrs., g.r. 4*l.* 10*s.* 645
54, Penn-rd. Villas, u.t. 53 yrs., g.r. 10*l.*, e.r. 60*l.* 465
Crouch Hill.—No. 48, u.t 74 yrs., g.r. 10*l.*, e.r. 60*l.* 1,330
Ealing.—Ranelagh-rd., f.g.r. 7*l.*, reversion in 77 yrs. 170
Ranelagh-rd., f.g.r. 6*l.* 10*s.*, reversion in 67 yrs. 160
Kilburn.—Carlton Vale, f.g.r. 8*l.* 16*s.*, reversion in 80 yrs. 230

By PRATT & MARSLAND.

Anerley.—119 and 119A, Anerley-rd., u.t. 57 yrs., g.r. 70*l.*, r. 135*l.* 685
38 to 46 (even), Ridsdale-rd., u.t. 66 yrs., g.r. 25*l.* 675
65, 69, and 81, Ridsdale-rd., u.t. 66 yrs., g.r. 14*l.* 8*s.* 420
Sydenham.—71 and 73, Newlands Pk., u.t. 77 yrs., g.r. 20*l.*, e.r. 90*l.* 585

By STIMSON & SONS.

Hampstead.—East Heath-rd., Heathside, c., r. 100*l.* 2,200
Sydenham.—27, Silverdale, f., e.r. 60*l.* 600
Hammersmith.—23, Brook Green-rd., c., e.r. 30*l.* 860
Walworth.—83, Mann-st., u.t. 50 yrs., g.r. 4*l.* 5*s.*, e.r. 34*l.* 375

By J. A. & W. THARP.

Bishopsgate.—25 and 26, Spital-sq., f., r. 161*l.* 4*s.* 3,060
27 and 28, Spital-sq., and factory premises adjoining, f., r. 66*l.* 14*s.* 10,150
Stepney.—25, Stepney-causeway, f. 335
Hackney.—51, Mare-st., with factory and shop adjoining, area 7,245 ft., f., r. 180*l.* 3,245
53, 55, and 57, Mare-st., with factories in rear, area 20,525 ft., r. 310*l.* 5,960
Bethnal Green.—77, 79, and 81, Hare-st., f. 1,615
28, Pollards-row, f. 450
27, 29, 31, and 33, Hare-st., u.t. 74 yrs., g.r. 30*l.* 2,505
Leytonstone.—85, Mornington-rd., f., r. 32*l.* 370

By C. P. WHITELEY.

Kennington.—5 to 13, Aulton-pl., f. 3,345

July 19.—By BARKER & SON.

Leytonstone.—395, High-rd., u.t. 81 yrs., g.r. 5*l.* 5*s.*, r. 52*l.* 290
18, Woodriffe-rd., f., r. 28*l.* 475

By PROTHEROE & MORRIS.

Kensal Rise.—1 to 32, Chamberlayne-mansions, f., r. 10*l.* 4*s.* 6,000
1 to 20, The Quadrant, f., r. 527*l.* 2*s.* 4,800
Wandsworth.—11 and 13, West Hill, u.t. 71 yrs., g.r. 14*l.*, r. 64*l.* 530
Gunnersbury.—51 and 53, Wellesley-rd., u.t. 72 yrs., g.r. 10*l.* 10*s.* 405

By SCOBELL & LAKE.

Leytonstone.—72, 74, and 76, Gurney-rd., u.t. 54½ yrs., g.r. 10*l.* 10*s.* 650
Kentish Town.—85 and 93, Prince of Wales-rd., f., r. 80*l.* 1,400

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for

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improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 11 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 6	,,	at railway depôt.
Red Wire Cuts	1 14 6	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 4 6	,,	,, ,,
Do., Bullnose	4 9 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 2 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	£ s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	34 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	,, ,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivere l
Stourbridge Fire-clay in sacks,	28s. od.	per ton at rly. dpt

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube, deld. rly. dep't.	
Bath ,,	1 7	,,	,,
Farleigh Down Bath	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,,	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks	2 2½	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4½	,,	,,
Hard York in blocks	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt	
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.	
,, ,, ,, 6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.	
,, ,, ,, 3-in. do.	1	2½ ,, ,,	

SLATES.

In. in.	£ s. d.		
20×10 best blue Bangor	11 5 0	per 1000 of 1800 at rly. dep.	
,, best seconds ,,	10 15 0	,,	,,
16× 8 best ,,	6 2 6	,,	,,
20×10 best blue Portmadoc	10 18 0	,,	,,
16× 8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green	11 2 6	,,	,,
16× 8 ,, ,,	6 15 0	,,	,,
20×10 Permanent green	10 0 0	,,	,,
16× 8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000	at rly. depôt.
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 12 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	more than battens.

	At per load of 50 ft.	
Fir timber: Best middling Dantzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 12 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	19 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	19 0 0	20 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 0 0	16 0 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 10 0	15 10 0
Second yellow deals, 3 in. by 11 in.	16 10 0	17 10 0
Do. 3 in. by 9 in.	15 0 0	16 0 0
Battens	12 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	11 10 0	12 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 12 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine— First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine— Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

	Per square	
Prepared Flooring— 1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	8 0 0
Compound Girders ,, ,,	9 0 0	10 5 0
Angles, Tees and Channels, ordinary sections	8 17 6	10 17 6
Flitch Plates	9 0 0	9 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -

PRICES CURRENT (*Continued*).

METALS.

	Per ton in London. £ s. d.	£ s. d.
Sheet Iron, galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	1 0 0	- - -
Pipe in coils	15 1 0	- - -
Soil Pipe	18 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 0 0	- - -
Silesian	23 10 0	- - -
COPPER— Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,, ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 5	- - -
SOLDER—Plumbers' ,,	0 0 7	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

PLASTER, &c.

	s. d.		
Coarse Plaster	30 0	per ton delivered.	
Fine ,,	38 0		,,
Coarse Keenes and Parian cement	51 6	,,	,,
Fine do. do.	59 6	,,	,,
Robinson's Fireproof Cement	51 6	,,	,,
Do. Finishing ,,	56 6	,,	,,
(Exclusive of the ordinary charge for sacks.)			
Whiting		,,	,,

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.	
,, ,, fourths	2¾d.	,,	,,
21 oz. thirds	3¾d.	,,	,,
,, ,, fourths	3¾d.	,,	,,
26 oz. thirds	5d.	,,	,,
,, ,, fourths	4¾d.	,,	,,
32 oz. thirds	6d.	,,	,,
,, ,, fourths	5¾d.	,,	,,
Fluted sheet, 15 oz.	3¾d.	,,	,,
,, ,, 21 ,,	4¾d.	,,	,,
½ Hartley's Rolled Plate	3d.	,,	,,
⅓ ,, ,, ,,	3¾d.	,,	,,
½ ,, ,, ,,	4d.	,,	,,

OILS, &c.

		£ s d.
Raw Linseed Oil in pipes	per gallon	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Boiled ,, ,, in pipes	,,	0 3 0
,, ,, ,, in barrels	,,	0 3 1
,, ,, ,, in drums	,,	0 3 3
Turpentine, in barrels	,,	0 2 4
,, in drums	,,	0 2 6
Genuine Ground English White Lead	per ton	23 0 0
Red Lead, Dry	,,	23 10 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

M. & C. (Amounts should have been stated).

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BARNSLEY.—For the erection of three houses, Long-car-lane. Messrs. Wade & Turner, architects, 10, Pitt-street, Barnsley:—

Masonry.—G. Haigh, Sheffield-road* £830 0 0
Joinery.—Turton Bros., Pontefract-road* 295 0 0
Plumbing and Glazing.—B. Denison, Back Regent-street* 121 10 0
Plastering.—C. Dryden, Doncaster-road* 96 0 0
Slating.—W. Scholey, Doncaster-road* 67 1 6
Painting.—W. Smith, Sheffield-road* 15 0 0
[All of Barnsley.]

BARNSTAPLE.—For additions, &c., to the Royal and Fortescue Hotel for Mr. Jones. Mr. Arnold Thorne, architect, 16, Cross-street, Barnstaple:—

Sanders & Karslake	£2,220 10	Barwick & Sillifant	£1,953 0
Bryant & Thorne	2,181 0	H. Burgess	1,895 0
W. Slee	2,015 0	Tucker & Sillifant, Vicarage Lawn*	1,870 0
Woolway & Sons	1,961 0		

BRIDLINGTON.—For the erection of stable, carriage houses, &c., Danes' Dyke, for Miss Dormer. Mr. J. Earnshaw, architect, Bridlington:—

A. Gardam, Bridlington £351 14 0

BRISTOL.—For the completion of the Church of St. Thomas, Eastville. Mr. H. C. M. Hirst, architect, 30, Broad-street, Bristol:—

Wm. Church	£5,828	R. F. Ridd	£5,097
M. Darnford	5,740	E. Walters	5,066
F. G. Love	5,650	R. Wilkins & Sons	4,888
Daltry & Son	5,583	E. Clark	4,798
E. Love	5,360	[All of Bristol.]	
C. A. Hayes	5,157		

COLCHESTER.—For the erection of Freemasons' Hall, Abbeygate-street. Mr. C. E. Butcher, architect, 3, Queen-street, Colchester:—

Harris & Rowe	£2,494	W. Chambers	£2,189
Jas. Grimes	2,400	Dobson & Son	2,180
A. E. Diss	2,300	T. J. Ward	2,165
H. Myall	2,279	R. Beaumont	2,117
A. Diss	2,250	Jas. McKay	2,095
Drysart & Co.	2,247	Everett & Son, Colchester*	2,050
E. West	2,229		

CROYDON.—For the construction of brick sewer culverts (1¼ miles), Mitcham-road, for the Town Council:—

Johnson & Langley, Leicester £4,296 4

DEVONPORT.—For the erection of business premises, for Messrs. Shears, Stroud, & Stephens, at Albert-road. Mr. Edgar M. Leest, architect, Public Hall, Devonport:—

A. Andrews	£1,195 0	T. May	£1,022 0
J. Paynter	1,164 10	G. B. Turpin	998 0
Jenkin & Son	1,100 0	Wakeham Bros., Plymouth*	993 0
W. E. Blake	1,067 0		

ELGIN, N.B.—For the erection of a residence, Fortteath-avenue. Mr. R. B. Pratt, architect, Town and Country Bank-buildings, Elgin:—

Masonry.—Davidson & Hay, Elgin
Carpentry.—McKay & Son, Dufftown
Plumbing.—Ross Brothers, Elgin
Slating.—John Wilson, Dufftown
Plastering.—Brodie, Elgin
Painting.—Fordyce, Elgin
} £900
[Walls and grounds not included]

EPSOM.—For the erection of residence in Burgh Heath-road, Epsom. Mr. Frederick Banister, architect, The Outer Temple, London, W.C.:—

Cropley Bros., Limited, Epsom* £2,637

HAYWARDS HEATH (Sussex).—For the erection of offices and buildings, Boltro road, for the Cuckfield Rural District Council. Mr. A. R. Pannett, architect, Hayward's Heath. Quantities by Mr. C. A. Kennett:—

J. Pickard	£7,356	Anscombe & Hedgecock	£5,319
W. Wallis	5,894	J. Finch	5,259
P. Jenkins	5,453	S. Knight	5,204
Field & Co.	5,443	Peerless, Dennis, & Co.	5,189
T. White	5,357		

[Architect's estimate, £5,300.]

LETTERKENNY (Ireland).—For additions, &c., to dwelling-house, Kilmacrenan. Mr. J. M'Intyre, architect, Letterkenny:—

Wm. Wilson	£171 0 0	W. J. Mooney, Londonderry*	£129 10 0
D. M. Caffrey	151 3 8		

LONDON.—For alterations to the Prince of Wales public-house, Kennington, S.E., for Mrs. E. Ashby. Messrs. Waring & Nicholson, architects, 38, Parliament-street, Westminster, S.W.:—

J. Marsland	£309	H. Hall	£289
Lapthorne & Co.	308	S. Roger	261
J. Mills	301		

LONDON.—For alterations to No. 131, Kennington-road, Lambeth, S.E., for the Trustees of the Lambeth Walcot Estate. Messrs. Waring & Nicholson, surveyors, 38, Parliament-street, Westminster, S.W.:—

Burman & Sons	£427	Smith & Son	£417
Lapthorne & Co.	424	S. Roger	262

LONDON.—For rebuilding premises, Nos. 20 and 21, Harp-lane, Great Tower-street, E.C., for Mr. Thomas Yeo. Mr. George Pearson, architect, 58, Moorgate-street, E.C. Quantities by Mr. H. Theobald, 6, South-street, Finsbury:—

Rider & Son	£6,837	Killby & Gayford	£5,633
Munday & Sons	6,665	Patman & Fotheringham, Ltd.	5,587
Johnson & Co., Ltd.	6,897	Lawrance & Sons	5,554
Williams & Sons	5,850	Mark Patrick & Son, Westminster Bridge-road*	5,470
Colls & Sons	5,816		
Perry & Co.	5,749		
Ashby & Horner	5,700		

LONDON.—For building shops and residential flats, Regency-street, Westminster, for Messrs. Robert Wells & Sons. Mr. A. A. Kekwick, architect, 18, Outer Temple, Strand. Quantities supplied:—

J. Parsons	£5,250	Jarvis & Sons	£4,574
Wall & Co.	4,929	Patman & Fotheringham	4,563
Hosegood & Sons	4,850	T. G. Sharpington*	4,349
J. Carmichael	4,699		
Smith	4,663		

LONDON.—For new drainage and sanitary work at the offices of the Guardians of the Strand Union, Henrietta-street and Maiden-lane. Mr. A. A. Kekwick, architect, 18, Outer Temple, Strand:—

Dent & Hellyer* £656

LONDON.—For the erection of stables, Tudor-grove, South Hackney, for Mrs. Dukes. Mr. John Parrish, architect and surveyor, Clapton Park, N.E.:—

Edwards, Cambridge-road, E.* £300

LONDON.—For alterations and additions to St. Martin's Town Hall, transforming it into the new Town Hall for the Council of the City of Westminster. Mr. John Murray, architect:—

—		Extra for Oak Panelling, &c., to the Council Chamber.	Extra for Marble to Principal Staircase.	
Perry & Co.	£27,988	£504	£793	£29,285
Kirk & Randall	27,940	560	800	28,300
Holland & Hannen	26,670	720	780	28,170
Higgs & Hill, Ltd.	26,500	584	760	27,844
Campbell, Smith, & Co., Ltd.	26,272	690	850	27,812
Johnson & Co., Ltd.	26,340	630	750	27,720
Holl day & Greenwood, Ltd.	25,930	580	760	27,270
B. E. Nightingale	25,272	630	775	26,677
Holloway Bros.	25,300	600	770	26,670
Prestige & Co.	24,877	525	780	26,172
Maple & Co., Ltd.	24, 60	360	760	25,680
Henry Lovatt	24,500	400	738	25,638
Bywaters & Sons	23,380	850	910	25,140
Patman & Fotheringham, Ltd.*	22,873	830	890	24,593

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's architect:—

ABBEY-STREET SCHOOL (Bethnal Green).—For new zinc flat roof over cloakrooms, &c.:—

J. Haydon	£318	Gibb & Co.	£225
Vigor & Co.	289	F. & F. J. Wood	219
J. F. Holliday	228	J. T. Robey*	184

ANN-STREET SCHOOL (Clerkenwell).—For sanitary and drainage works:—

L. H. & R. Roberts	£3,028 0	J. Peattie	£2,668 0
Stevens Bros.	2,886 0	Ashby & Horner	2,625 0
R. P. Beattie	2,865 19	Williams & Son	2,502 0
Willmott & Sons	2,830 0	Lawrance & Sons*	2,393 0
Killingback & Co.	2,733 0		

ASHBURNHAM SCHOOL (Upcerne-road, Chelsea).—For forming physical laboratory, balance-room, &c.:—

W. R. & A. Hide	£327	E. B. Tucker	£222
Maxwell Bros., Ltd.	324	General Builders, Ltd.*	213
Lathey Bros.	318		
W. Hammond	304		

BLOOMFIELD-ROAD SCHOOL (Plumstead).—Special rooms:—

T. L. Green	£1,247	Gregar & Son*	£1,177
E. Proctor	1,208		

BLUNDELL-STREET SCHOOL (Islington).—For re-hanging sashes of windows in old portion of school:—

Dearing & Son	£246 0 0	Williams & Son	£196 10 0
Stevens Bros.	226 0 0	F. W. Harris	169 0 0
C. & W. Hunnings	224 17 6	Thompson & Beveridge*	153 0 0

CALVERT-ROAD SCHOOL (Greenwich).—For sanitary and drainage works:—

Falkner & Sons	£3,697	J. Appleby	£3,244
H. Leney	3,583	J. & C. Bowyer	3,157
G. Parker	3,548	E. Proctor	3,150
Kirk & Randall	3,370	Johnson & Co.*	3,147

CANTERBURY-ROAD BOYS' AND GIRLS SCHOOL (Old Kent-road).—For heating works:—

Williams & Sons, Ltd.	£389 0 0	Brightside Foundry & Engineering Co., Ltd.	£294 0 0
Cannon & Sons	359 0 0	Dargue, Griffiths, & Co., Ltd.	274 13 7
Oldroyd & Co. Ltd.	357 0 0	Bates & Sons	270 0 0
Wippell Bros. & Row	340 0 0	Duffield & Sons	227 12 0
		G. & E. Bradley*	225 0 0

CATOR-STREET SCHOOL (Peckham).—For heating works:—

J. & F. May	£645	Fraser & Son	£492
Cannon & Sons	629	Wenham & Waters, Ltd.	473
G. & E. Bradley	615	Defries & Sons, Ltd.*	398
J. Esson	609		
Duffield & Sons	570		

CREDON-ROAD SCHOOL (South Bermondsey).—For partitions, &c., in infants' department:—

G. Kemp	£730	J. F. Ford	£622
Rice & Son	698	H. Groves	539
J. C. Chalkley	673	H. Line*	515

EDINBURGH-ROAD SCHOOL (Ladbroke Grove-road).—For heating works:—

Wippell Bros. & Row	£753 17 6	Turner & Co.	£586 10 0
G. Davis	660 0 0	Brightside Foundry & Engineering Co., Ltd.	577 0 0
Dargue, Griffiths, & Co., Ltd.	610 12 10	Knight & Sons	575 0 0
Skinner, Board, & Co.	605 6 0	Duffield & Sons*	570 0 0
Oldroyd & Co., Ltd.	602 0 0		

ELM COURT (Tulse Hill).—For adaptation of building for residential school for fifteen blind children:—

	A†	B‡	Total.
	£	£	£
J. F. Ford	316	2,478	2,794
Maxwell Bros., Ltd.	326	2,456	2,782
Smith & Sons, Ltd.	306	2,436	2,742
Garrett & Son	280	2,215	2,495
A. Acworth	274	1,939	2,213
Bulled & Co.	318	1,810	2,128
G. Kemp§	1,837	281	2,118
J. & C. Bowyer*	293	1,738	2,031

A†.—For the alterations and other work specified to adapt the building at rear of site for a gymnasium and caretaker's residence, including the portion of new drainage work connected therewith, and also including the provisional sum of £85.

B‡.—For additions, alterations, and other work to main building, including the new drainage in connexion therewith, together with the cleaning and painting to billiard-room outbuilding, &c. (provisional sum, amounting to £235, included).

§ This contractor appears to have reversed the items A and B.

GORDONBROCK-ROAD SITE (Brockley).—For removing and re erecting iron buildings from the Deodar-road site:—

Rowell & Co.	£1,723 16 6	J. & W. T. Hunter	£1,285 0 0
T. Cruwys	1,589 0 0	Smith & Co.	1,229 0 0
Leather & Sons	1,437 0 0	W. Harbrow*	1,150 0 0
Hawkins & Co.	1,415 10 0		
Mitson & Co.	1,399 13 8		

GRANGE HILL-ROAD SITE (Eltham Park).—For removing and re-erecting iron buildings from the Mansfield-road site, Gospel Oak:—

Rowell & Co.	£1,690 9 6	Mitson & Co.	£1,400 0 0
T. Cruwys	1,549 0 0	J. & W. Hunter	1,286 0 0
Leather & Sons	1,472 0 0	Smith & Co.	1,179 0 0
Hawkins & Co.	1,424 10 0	W. Harbrow*	1,102 0 0

HACKNEY (Groups 2 and 3).—For repairs on schedule:—

	Group 2. Per cent.	Group 3. Per cent. on the Schedule of Prices.
McCormick & Sons	+35	+35
†J. Haydon	+30	+25
‡Bruce, Croom, & Co.	+25	+25
†Barrett & Power	+25	+25
G. Wales*	+25	+25

† These firms require an additional 10 per cent. for sanitary work.

‡ This firm requires an additional 25 per cent. for sanitary work carried out under the Board's Sanitary Surveyor.

HAVERSTOCK HILL SCHOOL (St. Pancras).—For special school, domestic economy school, and schoolkeeper's house:—

Gough & Co.	£8,850	McCormick & Sons	£8,554
Wall & Co.	8,628	Leslie & Co., Ltd.	8,540
Simpson & Son	8,590	C. Cox	8,516
Patman & Fotheringham, Ltd.	8,589	J. & M. Patrick	8,300
Allen & Sons, Ltd.	8,588	Lawrance & Sons	8,206
		Treasure & Son*	8,128

MALMESBURY-ROAD SCHOOL (Bow).—For sanitary and drainage works:—

L. H. & R. Roberts	£3,097	Williams & Son	£2,894
Lawrance & Sons	2,985	Stevens Bros.	2,744
Johnson & Co.	2,916	J. T. Robey*	2,280
Killingback & Co.	2,894		

[See also page 93.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Fire and Police Station	Manchester	Town Clerk	July 31
Masonic Hall	Egremont	J. Lowery, 59, Main-street, Egremont	Aug. 1
Alteration of Ecclesall Church	Sheffield	Rev. T. Houghton, Ecclesall	Aug. 31
Public Baths	Chelsea	Baths Committee, 171, Kings-road, Chelsea	Oct. 1
*Public Baths and Washouses	Met. Borough of Camberwell	150 guineas ; 75 guineas ; and 50 guineas	Oct. 29
Twenty Workmen's Dwellings	Dudley	J. Gammage, Surveyor	No date
School for 750 Children, St. Peter's Port	Guernsey	Rev. G. E. Lee, Rector	do.
Laying out Ground Western Promenade	Penzance	T. H. Cornish, Town Clerk	do.
*New Municipal Buildings, Fire Station, &c.	Walton-on-Thames U.D.C.	30, 20 and 10 guineas	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Supply of Materials and Execution of Works	Lewisham Council	Surveyor, Town Hall, Catford	July 29
*Purchase and Pulling Down Old Houses	do.	do.	do.
Farm Steading, Moss Side, N.B.	.....	W. Reid, Architect, Saltoun-square, Fraserburgh	July 30
Walling, &c., Recreation Ground, Brimrod	Rochdale Corporation	S. S. Platt, Civil Engineer, Town Hall, Rochdale	do.
Large Shed, Skelmanthorpe	Messrs. E. Field & Sons	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Improvement Works, Hawthorn-road	Bootle Corporation	Borough Engineer, Town Hall, Bootle	do.
Outfall Sewer	Yeovil Corporation	W. K. L. Armytage, Surveyor, Municipal Offices, Yeovil	do.
Cast-iron Mains, &c.	Slough Gas Company	Secretary, Gas Offices, Slough	do.
Additions to Workhouse	Bakewell Guardians	C. O. Francis, Architect, 5, Richmond-street, Liverpool	do.
Additions to Beckett Hospital, Barnsley	.....	R. & W. Dixon, Architects, 5, Eastgate, Barnsley	do.
Residence, &c., Kilcooney, Ireland	Dungarvan Guardians	J. R. Dower, Poor Law Office, Dungarvan	do.
Warehouse, West Grimsby	Mr. G. Shoesmith	Rope & Jackson, Architects, Victoria-street, Grimsby	July 31
Additions, &c., to Two Houses, Huddersfield	.....	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Sewering, &c., Private Streets	Blackpool Corporation	J. S. Brodie, Surveyor, Town Hall, Blackpool	do.
Filter Beds, Lochornie	Lochgelly Town Council	Buchanan & Bennett, Civil Engineers, 12, Hill-street, Edinburgh	do.
Sewerage Works	Whitley U.D.C.	J. P. Spencer, Civil Engineer, 30, Howard-street, North Shields	do.
Shop Premises, &c., near Hayle, Cornwall	Mr. G. Tonkin	S. Hill, Architect, Green-lane, Redruth	do.
Building Work at Police Courts, Pontypridd & Porth	.....	Cook & Edwards, Architects, Bridgend	do.
Industrial Hall, &c., Cork	.....	H. A. Cutler, Civil Engineer, Municipal Buildings, Cork	do.
Cottage, &c., at Hospital	Auckland, &c., Hospital Board	W. Perkins, Architect, Victoria-street, Bishop Auckland	do.
House and Stabling, Flamborough	Mr. J. Hall	J. Shepherdson, Architect, 15, Manor-street, Bridlington	do.
Building Work at Workhouse	Glennamaddy Guardians	J. R. D'Arcy, Board Room, Glennamaddy	do.
Sewerage Works	Whitley & Monkseaton U.D.C.	J. P. Spencer, Civil Engineer, 30, Howard-street, North Shields	do.
Forming North-street	Alloa Town Council	Frame & Son, Architects, 43, Mill-street, Alloa	Aug. 1
Mortuary Buildings, Alpha-road	Surbiton U.D.C.	J. Bell, Council Offices, Surbiton	do.
Additions to Workhouse, Pleck-road	Walsall Guardians	Bailey & McConnal, Architects, Bridge-street, Walsall	do.
Sanitary Conveniences, &c., Potternewton Park	Leeds Corporation	City Engineer, Municipal Buildings, Leeds	do.
Five Cottages, &c.	Louth R.D.C.	L. Turley, Civil Engineer, Council Offices, Louth	do.
Six Houses, &c., Darton, near Barnsley	Barnsley British Co-op. Soc., Ltd.	Senior & Clegg, Architects, 15, Regent-street, Barnsley	do.
Business Depot, Belfast	Messrs. Lennon Bros.	W. J. Moore, Architect, Ann-street, Belfast	do.
Convent Chapel, Deal	.....	Superior, The Convent, West-street, Deal	do.
Cast-iron Pipes (110 tons) Glasgow	Young's Collieries, Ltd.	Johnstone & Rankine, C.E., 238, West George-street, Glasgow	do.
Granite and Road Metal	Bishop's Stortford U.D.C.	T. Swatheridge, Council Offices, Bishop's Stortford	Aug. 2
Street Works, Cromer-road	Branksome U.D.C.	S. J. Newman, Architect, Council Buildings, Branksome	do.
Business Premises, Merthyr Tydfil	Miss M. Davies	E. M. B. Vaughan, Architect, Cardiff	Aug. 3
Kerbing, &c., Footpaths	Bexhill U.D.C.	G. Ball, Civil Engineer, Town Hall, Bexhill	do.
Sewering, Levelling, Paving, &c.	do.	do.	do.
Road Metal, &c.	Carrickfergus U.D.C.	J. Boyd, Town Hall, Carrickfergus	do.
Asphalting Footpaths, near Meadowfield	Brandon U.D.C.	R. Gardner, Surveyor, Langley Moor, near Durham	do.
Road Metal (500 tons)	Epsom U.D.C.	E. R. Capon, Surveyor, Church-street, Epsom	do.
Retort Houte, &c.	Ashton-in-Makerfield U.D.C.	A. Sykes, Council Offices, Ashton-in-Makerfield	do.
Additions to Business Premises, Cardiff	Messrs. Heitzman & Sons	Veall & Sant, Architects, 6, Arcade-chambers, High-street, Cardiff	do.
Additions, &c., to Inn, King's Lynn	Messrs. W. & T. Bagge	H. Tilson, Architect, Railway-road, King's Lynn	do.
*Offices, &c.	Birkenhead Union	See Advertisement	do.
Chapel, Loughor	.....	T. Arnold, Civil Engineer, Castle Buildings, Llanelly	Aug. 4
School and House, The College, Llandovey	.....	Austin & Paley, Architects, Castle Park, Lancaster	Aug. 5
Street Works, White's-lane, &c.	Cleethorpes U.D.C.	E. Rushton, Civil Engineer, Poplar-road, Cleethorpes	do.
100 Houses, Penydarren, Merthyr	Merthyr Tidfil U.D.C.	J. Vaughan, Town Hall, Merthyr	Aug. 6
Gas Works	Torquay Corporation	F. S. Hex, Town Hall, Torquay	do.
*Additions to Public Library	Willesden District Council	O. Claude Robson, Public Offices, Dyne-road, Kilburn	do.
Additions to Church, Ackworth, Pontefrat	.....	C. H. Fowler, Architect, The College, Durham	do.
Electric Lighting to Three Schools	Grays Thurrock School Board	Board Room, Quarry Hill, Grays	do.
*Painting Works at Infirmary	Lambeth Guardians	Guardians' Offices, Brook-street, Kennington	Aug. 7
*New Infirmary Building	King's Lynn Union	Chas. Smith & Son, Merchants, Reading	Aug. 8
Sewage Disposal Works	Clones U.D.C.	J. H. H. Swiney, Civil Engineer, Avenue-chambers, Belfast	Aug. 9
Settling tanke, &c.	Hunslet R.D.C.	Marriott & Co., Dewsbury	Aug. 10
Drainage and Water Supply Works	Chipping Campdem R.D.C.	N. Lailey, Civil Engineer, 16, Great George-street, S.W.	do.
*Electric Lighting and Destructor Buildings	Gravesend Town Council	Borough Surveyor, Town Hall, Gravesend	Aug. 12
*Outfall Sewer	Aberdeen Town Council	Burgh Surveyor, Town House, Aberdeen	Aug. 13
*Municipal Offices and Town Hall	Walsall Corporation	The Town Clerk, Walsall	Aug. 24
100 Cottages	.....	Mines & Sutherland, Ltd., 65, South John-street, Liverpool	No date
Stables, &c., Llandaff	Cardiff Tramways Company	J. Glenn, Engineer, 11, Queen Victoria-street, E.C.	do.
Schools	Staines School Board	Law & Allen, Architects, Dacre House, Arundel-street, W.C.	do.
Three Cottages, New-street, Andover	.....	Luke Bull, 5, East-street, Andover	do.
Palisading, &c., St. Cuthbert's, Darlington	.....	Clark & Moscrop, Architects, Darlington	do.
Drainage Works, &c., Hassocks	Clayton & Keymer School Board	C. Botham, Architect, 128, Queen's-road, Brighton	do.
Club, Hemsworth, near Wakefield	.....	W. E. Richardson, Architect, Rothwell, Leeds	do.
Hospital, Brierley Common	Hemsworth R.D.C.	T. H. Richardson, Architect, Hemsworth, near Wakefield	do.
School, Redding	Grongemouth School Board	A. Gauld, Architect, Vicar-street, Falkirk	do.
Public Library	Stirling Town Council	Lessels & Taylor, Architects, 7A, Young-street, Edinburgh	do.
Twelve Houses and Shops, Tong-road, New Wortley	.....	Mr. Maude, Tong-road, New Wortley	do.
House, Watnall, Notts	.....	P. Paleston, 56, Upper Parliament-street, Nottingham	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Newport Corporation	.....	July 31
*Clerk for Surveyor's Office	Acton District Council	110*l.*	Aug. 6
*Chief Assistant to Borough Surveyor	Cheltenham Corporation	200*l.*	Aug. 7
*Architectural and Engineering Assistant	H.M. Dockyard, Devonport	.....	No date
*General Foreman	Government Northern Nigeria	300*l.*, &c.	do.
*Stonemason	do.	200*l.*, &c.	do.
Foreman Bricklayer	Government South Nigeria	240*l.*, &c.	do.
*Foreman Carpenter	do.	240*l.*, &c.	do.
*Foreman of Works (Public Works Department)	Government Gold Coast	250*l.*, &c.	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xix. & xxi.*

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Supply of Single Desks (Nos. 1—6):—

—	Desks, No. 1.	Desks, No. 2.	Desks, No. 3.	Desks, No. 4.	Desks, No. 5.	Desks, No. 6.
	Each. £ s. d.	Each. £ s. d.	Each. £ s. d.	Each. £ s. d.	Each. £ s. d.	Each. £ s. d.
Bennet Furnishing Co.	0 15 9	0 15 6½	0 15 4	0 15 1½	0 14 11	0 14 8½
T. Cruwys	1 3 0	1 2 0	1 1 0	1 0 0	0 19 0	0 18 0
G. M. Hammer & Co., Ltd.	0 15 6	0 15 6	0 15 3	0 15 3	0 15 0	0 15 0
W. H. Lascelles & Co.	1 2 6	1 2 4	1 2 3	1 2 2	1 2 1	1 2 0
London School Furniture Co.	*0 15 2	*0 14 11	*0 14 6	*0 14 6	*0 14 6	*0 14 6

Distemper Brushes, 9 oz.; Varnish Brushes, No. 1; Sash Tools, No. 6.
Window Blinds.

—			*M. Dowler & Son.	*Harriet Evans.	W. Gauron.	Janes & Son.	G. F. Janes & Co.
			s. d.	s. d.	s. d.	s. d.	s. d.
Brown holland or striped blinds fixed on wood rollers complete as Item 1		per ft. super.	0 3	0 3	0 5	0 3½	0 4
Ditto	ditto	as Item 2 ,, ,,	0 3	0 3	0 4	0 3½	0 3½
Ditto	ditto	on tin barrel rollers as Item 3 2½ in. in diameter ,, ,,	0 3½	0 3½	0 5½	0 3½	0 4
Ditto	ditto	3 in. do. do. ,, ,,	0 3½	0 3½	0 6½	0 3½	0 4½
Ditto	ditto	3½ in. do. do. ,, ,,	0 3½	0 3	0 6½	0 3½	0 4½
Ditto	ditto	on spring rollers, as Item 4 2 in in. diameter ,, ,,	0 4½	0 4	0 6	0 4½	0 5½
Ditto	ditto	2½ in. do. do. ,, ,,	0 4½	0 4	0 6½	0 4½	0 6
Ditto	ditto	3 in. do. do. ,, ,,	0 4½	0 4	0 7	0 4½	0 6

For the supply of desks (Standard and Kindergarten):—

—	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7. Kinder-garten.	No. 8. Kinder-garten.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
W. H. Lascelles & Co. ... each	1 2 8	1 2 6	1 2 5	1 2 4	1 2 3	1 2 2	0 17 9	0 17 7
Bennet Furnishing Co. ... each	0 18 9	0 18 6½	0 18 4	0 18 1½	0 17 11	0 17 8½	0 13 0	0 12 9
G. M. Hammer & Co., Ltd. each	0 18 0	0 18 0	0 17 9	0 17 9	0 17 6	0 17 6	0 13 0	0 13 0
London School Furniture Co. each	0 17 6	0 17 6	0 17 4	0 17 4	0 17 3	0 17 3	0 12 11	0 12 10

Running contracts for the supply of various articles of furniture, &c.:—

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H. Bouneau	0 10 0	0 13 6	10 8 0	*11 4 0	*0 9 0	0 5 5
T. Cruwys	0 7 0	0 15 0	11 0 0	12 0 0	0 5 0	0 6 0
Educational Supply Association, Ltd.	0 8 0	0 15 3	16 0 0	17 7 0	0 8 9	0 8 6
Hammer & Co., Ltd.	*0 6 0	0 13 6	20 0 0	22 0 2	0 7 6	0 10 6
Lascelles & Co.	—	—	12 12 0	14 0 0	0 7 6	0 10 9
London School Furniture Co.	0 6 0	*0 11 0	*10 4 0	11 4 0	*0 5 0	*0 5 3
Spencer & Co	—	—	20 0 0	22 10 0	0 10 0	—

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	Each. s. d.	Each. s. d.	Per doz. £ s. d.	Per doz. £ s. d.	Per doz. £ s. d.	Per doz. £ s. d.	Per doz. £ s. d.	Per doz. £ s. d.	Per doz. £ s. d.	Each. s. d.
Bradford & Co.	2 8½	2 8½	0 12 0	0 10 6	2 5 0	7 10 0	21 5 0	0 13 0	1 17 0	0 8½
Summerscales & Sons, Ltd.	3 4	3 4	0 12 0	0 11 0	2 8 0	8 8 0	24 0 0	1 10 0	3 0 0	0 10
Cherry Tree Machine Co., Ltd.	††2 9	3 3	0 10 0	*0 8 0	1 16 0	16 18 0	†16 16 0	0 18 0	2 0 0	*0 4
Thomas & Taylor, Ltd.	6 6	7 0	1 15 0	1 14 0	4 5 0	18 10 0	29 10 0	3 0 0	7 4 0	3 0
Waller & Co.	3 0	3 0	1 4 0	1 4 0	2 15 0	13 0 0	24 0 0	3 0 0	...	2 1
London School Furnishing Co.	*1 8	*1 9	0 11 6	0 9 0	2 2 0	7 10 0	*14 8 0	*0 13 0	1 4 0	0 8
H. Bouneau	4 3	2 6	1 2 0	1 2 0	2 5 0	*6 0 0	16 4 0	0 13 6	3 6 0	1 1
Wake & Dean, Ltd.	1 9	2 0	*0 9 0	0 9 0	*1 4 0	7 12 0	...	0 16 0	*1 4 0	0 9
G. H. Hammer & Co., Ltd.	2 6	...	0 15 0	0 12 0	2 2 0	10 10 0	15 0 0	1 0 0	...	...

† Subsequently reduced to £6 8s. 6d. ‡ Subsequently reduced to £16 2s.
†† Subsequently reduced to 2s. 6d. each.

MARLBOROUGH-ROAD SCHOOL (Chelsea).—For heating works:—

Cannon & Sons	£995 0	Wenham & Waters, Ltd.	£780 0
Wippell Bros. & Row	973 10	G. & E. Bradley	700 0
J. & F. May	930 0	Brightside Foundry and Engineering Co., Ltd.*	680 0
Williams & Sons, Ltd.	899 0		
G. Davis	800 0		

RENDLESHAM-ROAD SCHOOL (Upper Clapton).—For stepped flooring, &c., in infants' department:—

J. Haydon	£135	Silk & Son*	£91
Bruce Croom, & Co.	123		

ST. DUNSTAN'S-ROAD SCHOOL (Hammersmith)—For alterations to heating apparatus:—

Vaughan & Brown, Ltd.	£115 0 0	Wenham & Waters, Ltd.	£51 0 0
G. Davis	98 0 0	Werner, Pfleiderer, & Perkins, Ltd.*	50 19 6
Palowkar & Sons	79 15 0		
Duffield & Sons	66 0 0		

ST. STEPHEN'S NATIONAL SCHOOL (Worsley-road, Hampstead).—For alterations:—

G. Neal	£474	Williams & Son	£364
Antill & Co.	439	Stevens Bros.*	324
Marchant & Hirst	429		

LEVEN-ROAD SITE (Bromley-by-Bow).—For new mixed higher grade school for boys and girls. The school is a three-story building, and contains the following accommodation: — One hall (boys' and girls'), 1,912 sq. ft.; gymnasium, 1,335 sq. ft.; classrooms—ground floor, three forty-eight, two forty; first floor, three forty-eight, two forty; manual training centre for forty boys; drawing classroom, area 858 sq. ft.; science-rooms, area 1,670 sq. ft.; heating by low-pressure hot-water apparatus; area of site about 47,000 sq. ft.; playgrounds—area per child, boys', 83 sq. ft., girls', 84 sq. ft.:—

		If walls of classrooms and halls be plastered, add
McCormick & Sons	£23,910 0 0 ..	£195
Dearing & Son	23,279 0 0 ..	315
Chessum & Sons	23,273 0 0 ..	234
F. & F. J. Wood	23,240 0 0 ..	310
Munday & Sons	23,020 0 0 ..	291
C. Cox	22,997 0 0 ..	323
Perry & Co.	22,974 0 0 ..	295
Kirk & Randall	22,896 0 0 ..	298
Treasure & Son	22,851 0 0 ..	295
T. L. Green	22,586 0 0 ..	1,093
Lawrance & Sons	22,409 0 0 ..	291
C. Wall†	22,041 15 9 ..	210
Gregar & Son*	21,477 0 0 ..	249

† If fair internal and distempered face, &c., in lieu of glazed bricks, deduct £1,510 7s. 5d. This contractor also states that his tender is subject to the agreement being approved by his solicitor.

STOCKWELL-ROAD SCHOOL (Brixton). — For halls and other improvements:—

Providing new hall for each department, 42 ft. 6 in. by 26 ft. 6 in.; new staircases for boys' and girls' departments; cloakrooms, lavatories, and stockrooms for each department; teachers' room for girls and infants; forming babies' room and providing new kindergarten gallery; re-dividing and re-stepping centre classrooms in each department; providing platform in infants' hall; forming new infants' entrance and lobby; providing heating chamber and coal store in basement, and coal lift; new covered playground for boys; erecting cookery centre (to take the place of the iron buildings now being temporarily used for this purpose) adjoining schoolkeeper's house; heating by open fires and low-pressure hot-water apparatus; and providing new girls' and female infants' water-closets.

General Builders, Ltd.	£14,220	Johnson & Co., Ltd.	£13,577
Williams & Son	13,958	F. & H. F. Higgs	13,276
Holloway Bros.	13,836	Garrett & Son	13,006
W. Downs	13,737	E. Triggs	12,708
Mitchell & Son	13,623	Holliday & Greenwood	12,622
		J. & C. Bowyer*	£12,289

(A) TOWNMEAD-ROAD (Fulham); (B) KILMORIE ROAD (Stanstead-road, Forest Hill).—For fencing in sites for new schools:—

(A) *Townmead-road.*

Humphreys, Ltd.	£230	Hawkins & Co.	£190
J. & W. T. Hunter	195	W. Hammond	183
T. Cruwys	192	Mitson & Co.*	160

(B) *Kilmorie-road.*

J. & W. Patrick	£249 0 0	Mitson & Co.	£180 17 6
Hawkins & Co.	205 0 0	W. Harbrow	178 0 0
J. & W. T. Hunter	200 0 0	G. Bush*	165 0 0

Painting Works.

The work will be executed during the summer holidays—July 25 to August 24, 1901. Where exterior as well as interior work has to be done, the contractors will be allowed an additional week for the former:—

BARROW HILL-ROAD.—Painting exterior and cleaning interior:—

T. Cruwys	£447 10	Thompson & Beveridge	£333 0
Marchant & Hurst	426 0	W. Chappell*	255 10
Stevens Bros.	384 0		

BOARD'S STORES.—Painting exterior:—

Dearing & Son	£164 0	Johnson & Co.*	£137 10
T. Cruwys	143 17	W. Chaypell	120 0

BURRAGE-GROVE.—Painting exterior and cleaning interior:—

W. J. Howie	£551	H. Groves	£485
Johnson & Co.	505	E. Proctor*	475
Thomas & Edge	495		

CHATHAM-GARDENS.—Painting interior:—

Wall & Co.	£314	Silk & Son	£244
Dearing & Son	312	G. Barker*	243
Stevens Bros.	296		

CHEQUER-STREET. — Painting interior (new portion):—

F. T. Chinchen	£210 10	Marchant & Hirst	£196 0
Dearing & Son	210 0	G. Barker	161 0
McCormick & Sons	207 0	W. Chappell*	156 10

CUBITT TOWN.—Painting exterior:—

T. H. Jackson	£183 0	J. Haydon	£134 0
A. E. Symes	175 0	J. T. Robey*	108 11
A. W. Derby	144 0		

FINSBURY — "FORSTER." — Painting interior:—

T. Cruwys	£426 0 0	C. & W. Hunnings	£391 14 6
G. Kirby	408 0 0	Stevens Bros.*	387 0 0

GEORGE-STREET.—Painting exterior and cleaning interior (Boys' and girls' departments):—

Maxwell Bros., Ltd.	£412	W. Downs	£391
H. Line	410	J. F. Ford	377
W. V. Goad	399	Sayer & Son*	328

[See also next page.

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GLENGALL-ROAD.—Painting exterior :—

Corfield & Co.	£265 0	J. T. Robey	£201 17
A. W. Derby*	209 0		

GOPSALL-STREET.—Painting interior and exterior :—

Stevens Bros.	£645	Silk & Son	£489
Dearing & Son	564	T. Cruwys*	463

GRAVEL-LANE.—Painting interior :—

W. Downs	£420	G. Barker	£272
Johnson & Co.	394	J. Haydon	270
Barrett & Power	338	W. Hornet*	269

HASELTINE-ROAD.—Painting interior :—

J. & C. Bowyer	£380	W. J. Howie	£326
E. Proctor	353	C. G. Jones*	323
G. Kemp	342		

LEIPSIC-ROAD.—Painting interior and exterior :—

J. & M. Patrick	£587 0 0	W. Downs	£415 8 6
Sayer & Son	503 0 0	Rice & Son	406 0 0
W. V. Goad	490 0 0	G. Kemp*	392 0 0

"MICHAEL FARADAY."—Painting interior and exterior ;—

Johnson & Co.	£517 0	Lathey Bros.	£436 10
H. Line	483 0	Holliday & Greenwood, Ltd.	422 0
W. Downs	463 0	Rice & Son*	419 0
Sayer & Son	442 0		

OLD CASTLE-STREET—Painting interior and exterior :—

F. & F. J. Wood	£740 0	J. Haydon	£606 10
A. W. Derby	720 0	J. T. Robey*	571 5
G. Barker	678 0		

OLDFIELD-ROAD.—Painting interior and exterior :—

T. L. Green	£1,194	G. S. S. Williams & Son	£992
J. Grover & Son	1,024	Stevens Bros.	924
H. Wall & Co.	1,018	Barrett & Power*	884
McCormick & Sons	996		

PAGE'S-WALK.—Painting interior and exterior :—

W. V. Goad	£644	W. Hammond	£499
Johnson & Co.	585	Lathey Bros.*	487
J. & M. Patrick	573	Sayer & Son	484
H. Line	559		

PLASSY-ROAD.—Exterior painting :—

Johnson & Co.	£186	G. Kemp	£140
J. & C. Bowyer	184	C. G. Jones*	120
E. Proctor	158		

REDDIN'S-ROAD.—Painting interior :—

Sayer & Son	£407 0	Lorden & Son	£292 15
H. Line	390 0	Rice & Son*	288 0
J. F. Ford	343 0		

SILWOOD-STREET.—Painting interior and exterior :—

Sayer & Son	£686	Holliday & Greenwood, Ltd.*	£436
J. & M. Patrick	644		
H. Line	615		

STAR-LANE.—Painting interior :—

Marchant & Hirst	£415 0	W. Hammond	£273 19
W. Chappell	300 0	F. T. Chinchen*	258 17

SUMNER-ROAD.—Painting interior (P.T. school) and cleaning interior (main school) :—

Holloway Bros.	£534	Rice & Son	£425
H. & G. Mallett	458	H. Line*	417
Maxwell Bros., Ltd.	446	Sayer & Son	393

VICARAGE-ROAD.—Painting interior and exterior :—

Johnson & Co.	£607	H. Groves	£475
Thomas & Edge	495	E. Proctor	463
W. J. Howie*	477		

WARPLE-WAY.—Painting exterior (old and new portions), painting interior (enlargement), cleaning interior (old portion) :—

W. Hornett	£640 0	Lathey Bros.	£525 0
R. S. Ronald	606 0	Johnson & Co., Ltd.	449 15
J. & M. Patrick	577 0	Lorden & Son*	404 15
E. Flood	550 0		
W. Hammond	542 0		

WORDSWORTH-ROAD.—Painting interior and exterior :—

J. & M. Patrick	£1,389	Marchant & Hirst	£999
Dearing & Son	1,078	Stevens Bros.	940
Grover & Son	1,069	M. Pearson*	830
McCormick & Sons	1,036		

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The Builder.

VOL. LXXXI.—No. 3052. AUGUST 3, 1901.

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The Victoria Memorial.

No one will be surprised to hear that Mr. Aston Webb's scheme has been selected for the memorial to Queen Victoria. The laying out of the ground on an effective plan was an important element in the design, and of the five architects who were selected to compete, Mr. Webb is the one who, in his previous works, has shown most perception of plan, and who has had the most experience in laying out plans on a large scale. What the other competitors have made of it in this sense we shall know when the public exhibition of the designs, which has at last been promised, takes place; but we should expect to find that, as far as plan and general conception are concerned, the selected design will justify the choice of the Committee; though we are still of the opinion that the choice should have been made from a much larger list of competitors, and that the competition should either have been a public one or should have included many leading architects of the day who were practically shut out. As far as this event is concerned, the matter may be considered as settled; but we urge the point again in view of possible future competitions of the same kind. For a great public work there ought to be as large and unrestricted a competition as possible, if justice is to be done to artists, and if those of the public who care about such matters are to feel satisfied that the best has been done that was possible.

The perspective views and plans of Mr. Webb's design, together with a small and very rough clay model of the central memorial by Mr. Brock, were exhibited at the Foreign Office last week to those who received the invitation of the Secretary of the Office of Works. It is a curious example of the manner in which this important work has been hurried through by the Committee, and the total want of ordinary common-sense in artistic matters which distinguishes the English official mind, that Mr. Webb (and, we presume, all the other architectural competitors) had to make his design without any knowledge of the form and proportions of the sculptural monument which was to form the central feature. Our attention was drawn to this by noticing that Mr. Webb's perspective drawing showed only a roughly sketched outline of the central monument, which differed from the outline of the sculptor's model. On remarking on this, we were informed, as if it were quite a matter of course, that naturally it was so, as Mr. Webb had never seen the model. Could there be a more typical example of English fatuity about public works of art? Here is a great work in which the architecture is to form the *encadrement* to a sculptural memorial, the sculptor of which has been selected, and the architects are asked to make their design without having seen any model or sketch of the monument which is to form the centre of their work. It seems almost incredible: it would be, anywhere but in England.

Mr. Webb's design for the treatment of the site in front of Buckingham Palace has some resemblance to that suggested in fig. 3 accompanying the article on the subject in our issue of April 13: it includes at all events the idea of a semicircular architectural screen in front of the Palace, of ornamental parterres and fountains within the barrier, and of the curved roads diverging towards Constitution Hill and Buckingham Gate, and following the curve of the screen. The central monument also occupies the same place as suggested in our sketch plan, in the centre of the outside line of the semicircular screen, and facing the Mall. It is perhaps needless to say that Mr. Webb has not adopted our idea of the central canal facing the monument — it would have been of no use to have suggested such an idea in such a competition; first, because the instructions being to make a triumphal road of the Mall, the design would probably have been ruled out on the ground that a canal was not a road; secondly, because in an English architectural competition it is useless to suggest anything too bold or too original, or too much out of the common way; however beautiful might be the effect promised, it would be sure to be officially condemned as eccentric and extravagant. English people do not like anything to be suggested to them which has never been done before. It may be very well for an Oriental palace, we should be told, but we do not want such things in London.

Neither of course, has Mr. Webb suggested the rebuilding of the front block of the palace, which would also have put him out of court, as suggesting what was not asked for and what there were no funds provided for. But he has endeavoured to bridge over the gulf between the dingy palace front and the new screen and monument by interposing between them a rectangular forecourt following the lines of the present forecourt, and bounded by an architectural screen with gate-ways, pretty nearly if not precisely on the line of the present front railing. From the extremities of this screen, as a base, springs the more dignified and ornate semicircular screen, which consists of double colonnades forming a quadrant on each hand, stopped by pavilions at each end, and with an intermediate pavilion in the centre of each quadrant, which on the side towards the forecourt affords an occasion for the placing of an important piece of sculpture and for a fountain discharging into an ornamental basin. Where the two quadrants meet is to stand Mr. Brock's monument, projecting beyond the line of the screen, facing the central road of the Mall, and with the entrance and exit gates on each side of it. Thus, by the interposition of the rectangular forecourt, the principal architectural screen is kept a little separated from the palace, and the two are not brought into such harsh contrast as they would otherwise be, nor is the principal monument backed so closely up to the Palace front. The general

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architectural treatment of the screen is suitable and dignified. On the south side the quadrant roadway outside of the screen, in consequence of the low level of the St. James's Park ground at that point, will form a terrace road with a lofty retaining wall and a balustrade, and this will add to the picturesque and monumental effect of the whole.

The Mall is treated very much in the manner which has been proposed by the Committee from the first; the centre lines of trees are to be removed and replaced by trees spaced at regular distances and alternating with pedestals for sculpture, with some larger erections at two points, where it is proposed eventually to place sculpture groups representing Canada and Australia on one hand, and India and Africa on the other; but these we take it must be regarded as subsequent additions rather than as integral parts of the memorial scheme. One striking point however Mr. Webb has made, and such as has not been before suggested, in taking the Mall through into Whitehall. The Mall, if carried on in a straight line, would strike the Whitehall roadway at an oblique angle. There are different ways of getting over the unsymmetrical effect of this junction, but Mr. Webb has suggested the best, that of making a large monumental circular *place* there, surrounded by trees and with a monument or fountain in the centre. The circle, of course, serves to mask the irregularity of the junction, while providing a new and dignified feature at the entrance to the Mall. It is a tolerably obvious way of getting over the difficulty of lines, but it is not every architect who perceives the obvious way in such cases. Unfortunately the effect of this circular *place* will be very much marred by the fact that it will directly abut upon, and open up more decidedly to view, the wretched building recently erected as the new Admiralty. But that is a misfortune for which the architect of the scheme is not to blame.

Mr. Brock's clay sketch for the monument shows no details, but it composes well as a whole. It makes a generally pyramidal composition, with a thickly-proportioned stele or obelisk in the centre, at the base of which, on the east side, is the seated statue of Queen Victoria. The other three sides are occupied by figures representing, we are informed, Justice, Truth, and Charity. The stele is crowned by a figure of Victory, grouped with figures at her feet representing Constancy and Courage. The base of the whole is a platform, with steps flanked by lions. The whole promises well, but there ought to be a larger and more complete model of it seen before the final commission is given. In France that would be a matter of course. In England art is not of sufficient importance to go to that trouble and expense.

Considering, however, the manner in which the whole scheme has been hurried up, the result seems likely to be much more successful than could have been hoped. But we wish to repeat, most emphatically, our conviction that the refacing of Buckingham Palace with an architectural façade worthy of the situation ought to be an integral portion of the scheme. Whatever effort the architect has made to separate his design from the Palace, and to draw off attention from it, the proposed monumental road is a road up to Buckingham Palace, and the State gateways are State entrances to the Palace. And when we come to the Palace itself we are met by a miserable anti-climax. Nothing can get over or disguise that fact. Give the Palace a new front, or the whole thing is lame and incomplete.

NOTES.

The State and Art.

Sir E. Poynter's admirable letter in the *Times* of July 30, in reference to the refusal of the House of Lords to accept Lord Stanmore's motion for the formation of a Royal Commission similar in character to the Fine Arts Commission of 1842, will perhaps not be without some effect in the long run. It at all events serves to point out, from the position of a writer who speaks with authority on art, what a deadening effect the indifference and parsimony of the State authorities produces upon art and artists in this country. We have really gone backward in this respect during the last half century. Mistakes were made, no doubt in the frescoes with which the Houses of Parliament were decorated—mistakes both of decorative style and technical method; but at all events, the attempt to do something great was made, and, as Sir E. Poynter implies, it was not by any means so unsuccessful as it is the fashion to think now. And a government, by commissioning decorative paintings on a large scale, does something important for the promotion and encouragement of art. As Sir E. Poynter says, "the mere fact that an artist, especially if he be young, receives a commission from the State, gives a stimulus to his energies which no lesser form of patronage can supply." There can be no doubt that some part of the energy and vigour of French art is due not merely to the inherent genius of the French for art, but to the fact that French artists receive constant and substantial support from their Government in the shape of commissions for and purchases of large works; while in England, when any proposal is made to spend money in that way, it seems to be the first effort of the Treasury Department to oppose and suppress it as a useless expenditure. The formation of a Fine Art Commission with a certain defined power of annual expenditure on art would do something to get rid of a state of things which is discreditable to the country, and would ensure to artists some chance of earning distinction in public work. It is to be hoped the idea will not be allowed to drop.

The New Government Offices.

The reply given by the First Commissioner of Works the other night, in answer to a fresh question in regard to the carrying out of the Government Offices in Great George-street, however it may satisfy the public, will not satisfy architects, nor those few others who know anything about the conditions of carrying out architectural work. The First Commissioner was pointedly asked whether he had detailed drawings by the late architect (a question arising, we fancy, out of a suggestion in these columns), and admitted that he had not "except," he said "for the woodwork." If this is reported right, we do not understand it; it seems in the highest degree unlikely that Mr. Brydon should have prepared all the details for the woodwork at that early stage. The First Commissioner continued to the effect that the Office of Works had engaged Mr. Brydon's former principal draughtsman to assist in getting out the details. This looks to us very like a tactical arrangement entered into with the object of satisfying the public criticism which has arisen and is likely to arise in regard to this matter. We do not know how much Mr. Brydon ever left to his draughtsman; we have little doubt that he originated all his own details; and in any case what security have we that any weight will be given, in the Office of Works, to the judgment of the late architect's draughtsman? It is merely an attempt to provide some kind of answer; and it is an answer that will not be accepted. We must see an architect of learning and reputation appointed to carry out the building.

Theatre Regulations of the L.C.C.

The new schedule of regulations for the construction and arrangement of theatres just issued by the London County Council differs from their previously existing regulations mainly in the amplification of instructions on one or two special points. In place of requiring that any one proposing to erect a new theatre should first make an application in writing to the Clerk of the Council, it is now also required that he should make public his intention by exhibiting a notice-board on the proposed site, or by advertisement in three newspapers circulating throughout the county. A more important amplification is comprised in Section 10, which supersedes the Section under the same number in the previous regulations. In place of the general requirement of two separate exits for each tier, an additional exit is now required where the number of persons accommodated in the tier is over 500. The width of the exit doors is also specified in relation to the numbers of the audience, and an important and very wise addition is that in reckoning the numbers "standing space from which a view of the performance can be obtained" is to be reckoned in, as well as the seating accommodation. Under "corridors, passages, &c.," it is stated that, where possible, inclines should be used instead of steps, the gradient of such inclines being limited to 1 in 10. An attempt was made to defer the adoption of the new requirements until the Council could take the opinions of the leading theatre architects, but this was not carried. It would have been better had this course been taken; but in the main the alterations appear to be in the right direction.

The Widening of Piccadilly.

The widening of Piccadilly from Hyde Park Corner to Devonshire House will, no doubt, facilitate the progress of traffic in that particular part of this thoroughfare. It is quite certain, however, that it will increase the block between Albert Gate and Hyde Park Corner, and from Piccadilly Circus to Devonshire House. The tendency of constructing a wide thoroughfare will be to bring a larger quantity of traffic into it which will be stopped at the two narrow ends. When traffic also can move quickly along the broadened thoroughfare, it will come in larger masses to the two termini. It is obvious, therefore, that the widening of Piccadilly must necessitate what has long been

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urgent, the widening of the thoroughfare from near Albert Gate. Fortunately, this is but a short piece of street, and undoubtedly this work should be carried out at once. The question will then arise, How is Piccadilly East, as we may call it, to be dealt with? The answer appears to be that opportunities for the traffic to be carried out of this part must be increased. One form of relief which would be easy and inexpensive would be the construction of a carriage thoroughfare from Piccadilly to the drive in the Mall, through Green Park, by the side of the walk in front of the Arlington-street and other houses which now look into the Green Park at its east end. Distasteful, also, as it might be to the frequenters of the Pall Mall clubs, there can also be no doubt that some of the omnibuses which now run in Piccadilly might be turned into Pall Mall for the purpose of relieving the traffic between Devonshire House and Piccadilly Circus.

A Proposed Technical Dictionary.

THE German Society of Engineers (*Verein Deutscher Ingenieure*) has undertaken the arduous and we fear rather thankless task of compiling a trilingual dictionary of technical terms and phrases, in German, English and French. It is to be issued in three volumes, respectively arranged as (I.) German-English-French, (II) English-German-French, (III.) French-German-English. Dr. Hubert Jansen, who has a reputation as a lexicographer, has been engaged as general editor. The system pursued has been to write to a number of scientific and technical societies in the three countries and ask them to appoint or recommend members of their respective bodies to take up certain special subjects in each language, and to each of those who have consented to act a prepared list of questions has been sent, the object of which is to get the work systematically arranged and subdivided. We have no doubt such a dictionary, if adequately carried out, would be very useful; but it is rather a question whether it is not practically an impossible task. In the first place, the work must be so extensive and complicated that it is difficult either to fulfil it entirely or to set any logical boundaries to it; in the second place, it is exceedingly difficult to get two men of different nationalities who will be able to say positively what term in the one language is the exact correlative of any term in the other language. The only sure way seems to be having either objects or drawings of them before a trilingual committee, when each can state what is the name for it in his language. There are many technical terms, however, which cannot be represented by objects or drawings, as they only define processes. However, if the attempt is carried through, we hope (but do not expect) that technical terms in architecture will receive due attention. We have already on our shelf a trilingual technical Dictionary in three volumes, German, French, and English, on exactly the lines now proposed—a large work of 800 to 900 double-column pages in each volume, published some few years ago. We have occasionally consulted this for the meaning of architectural terms in French or German publications, and have never in any case got any information from it—the words used were not in the Dictionary. Works of this kind are usually compiled by people who are familiar with engineering and workshop terms, but know nothing of architectural phraseology.

Electro-Chemical Industries.

MR. J. W. SWAN'S presidential address to the Society of Chemical Industry at Glasgow last week is well worth reading, not only by scientists but also by all who are interested in technical education and its bearing on the commercial welfare of the country. Chemical industries are peculiarly liable to change, and the commercial methods universally employed to-day may in a year or two be abandoned. In 1880 the Clyde, the Mersey, and the Tyne were the supply markets of the world for alkali. Owing to the great development of the electrical industries abroad this state of things no longer exists. If we are to win back our commercial supremacy we must be able to manufacture electrical power cheaply. There is no hope from primary batteries, for even if we got zinc for nothing it would still be cheaper to use dynamos. Mr. Swan says that there is some hope of getting electricity direct from coal. Inventors generally try to make a carbon consuming cell. Mr. Swan suggests that they should invent a gas-consuming cell like a Grove's battery, and this seems to us excellent advice. At present the most practical method is the making of cheap gas by means of producers for use with gas engines. Mr. Swan exposes the fallacy that water-power is necessarily cheap. He points out that the capital outlay per horse-power developed is often prohibitive. In Switzerland it is sometimes under 3*l.* 10s., whilst at Lyons it is 84*l.* In Norway there is one place where water-power is generated at a cost of 1*l.* per horse-power per year, but there are places where it costs ten or twenty times this amount. In the United Kingdom the cheapest steam power is about 5*l.* per horse-power per year, and is produced where coal costs 5s. per ton. Mr. Swan makes some caustic remarks on the neglect of higher technical education in England and Ireland. It is little use giving to the working classes a "disjointed smattering of miscellaneous science." It is an absolute necessity for our manufacturers and our technical chiefs to have a "scientific training of university standard." We agree with him in thinking that scientific research should be endowed largely from the public funds. It is humiliating to think that our electricians have to send to the German Reichsanstalt for their standards of light.

The National Art Competition.

THE exhibition of drawings and models made by the students of the schools of art throughout the country under the Board of Education is now open in one of the iron buildings at South Kensington. The exhibition this year is below the average in interest owing to the unaccountable exclusion of the work done by the students in training at South Kensington for art masters. Hitherto these advanced students have received honorary awards in the annual competition, and have carried off the majority of the high awards. Their exclusion is most noticeable among the advanced designs for applied art, and in drawing and modelling from the life. Every year there is a fluctuation of interest from one class of work to another; one year it has been applied design, latterly it has been rather in the direction of book illustration, and this year it may be fairly claimed that the most consistently good work is among the measured drawings of ancient buildings. Year by year the architectural exhibits have been as a whole most unworkmanlike, and the architectural design this year is even worse than usual; the measurement drawings, on the other hand, show very marked improvement. Mr. Garnet J. Hands has produced a valuable illustration of the Priory Church, Great Malvern, in a fine set of drawings which receive a gold medal, and a similar award has been made to Mr. F. E. Collington, of Nottingham, for his drawings of the well-known sedilia in the chancel of All Saints' Church, Hawton. Amongst other well-chosen subjects that have been measured are the Customs House, King's Lynn, the Parish Church, Wrexham, and portions of Kirby Hall. The designs for wall-papers, hangings, jewellery, and metal-work are not so good as in previous years. A feature of the present exhibition is some excellent colour prints from Lambeth. Miss M. B. Keighly, of Plymouth School, has won a gold medal with some fine figure designs for embroidery. The designs for stained glass are also good, notably those of Miss Geraldine Morris and Miss E. M. K. Richards.

Want of Water at Holsworthy.

DR. THEODORE THOMSON'S Report to the Local Government Board in regard to the sanitary circumstances and administration of the Holsworthy Urban District gives evidence of a most unhappy state of things both in regard to the quality and quantity of the water supply. The supply is obtained from shallow wells sunk in the limestone rock on which the town stands—wells for the most part un-steined, and therefore subject to pollution. There are six public wells, but they all go dry in summer except the "Waterloo" well. The local Medical Officer of Health gives, in one of his reports, the following distressing account of what he calls the "annual water famine":—

"By the second week in May (1896) very little water remained in any of the wells, and in June the large water barrel had to be requisitioned to supplement the supply. During the months of July and August a large number of the inhabitants of the town were entirely dependent on this barrel of water, which was brought into the town, sometimes twice, but generally only once a day. The advent of the barrel into the market square was the signal for a rush of applicants for drinking water, which was soon exhausted, late comers having to return empty-handed to beg or borrow from their more fortunate neighbours."

It seems almost incredible that such a state of things should exist in a district under sanitary authority in this country.

THE SANITARY INSTITUTE.—At an examination in practical sanitary science, held at Liverpool on July 12 and 13, 1901, three candidates presented themselves, one of whom, Mr. F. W. Tomlinson, was awarded a certificate.

ST. MARTIN-IN-THE-FIELDS TOWN HALL.—Mr. John Murray has been appointed architect for the alterations and additions to be carried out with a view to converting the present structure for purposes of a Town Hall for the City of Westminster Council. Messrs. Patman & Fotheringham's tender of 24,503*l.*, which includes 1,720*l.* for certain extra interior decorations, has been accepted. The Town Hall was built in 1890-1, by Messrs. John Mowlem & Co., who contracted for 23,200*l.*, after the designs of R. Walker, *obiit* 1896. The site, being that of Nos. 113 4-5, St. Martin's-lane, and a portion of Hemming's-row, was formerly that of the Swan Close and the parish pond. It was acquired by the (old) Vestry from the Marquis of Salisbury and the late Metropolitan Board of Works.

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LETTER FROM PARIS.

THE question of the fortifications of Paris, for a long time in suspense, has recently passed into a new phase, and seems now in the way to be definitely settled. Hitherto the State and the City authorities have not been able to agree as to the utilisation of the land which the demolition of the fortifications will leave free. If the arrangement now proposed is carried out the City authorities will undertake all the cost of the new roadways, and of the circular boulevard which should form the new boundary of Paris; this will amount to about 50,000,000 fr. All the rest of the land will remain the property of the State and will be offered for sale, the City reserving the right to acquire those portions which it considers necessary for the erection of certain hospitals and other public institutions. This practical scheme puts an end to the idea of forming around Paris a great circle of trees and gardens; but at all events the city will by this means, at a comparatively small cost, get rid of a useless line of bastions and ditches.

The municipal administration has at last finished, in the thirteenth arrondissement, the artesian well of the Butte aux Cailles, after operations which have been going on for thirty-eight years. This work, commenced in 1863, was a serious blunder on the part of the municipal engineer's department, for the new well, which has been both difficult and costly to carry out, furnishes less water than the old one. In fact it is evident that for the water-supply of Paris, a system of artesian wells is entirely a Utopian idea, and that it is much better to keep to the system of storing water from the surrounding rivers, unless the administration decides to consider seriously the proposal to tap the lake of Geneva, which has been suggested by certain engineers.

The Commission which has in hand the study of the important scheme of the Canal des Deux Mers to cross a large portion of France, has appointed a sub-committee to visit the various important canal works abroad. This committee, presided over by M. Gerville Réache, will first visit Liverpool and study the canal from Liverpool to Manchester, proceeding from thence, viâ Hull and Hamburg, to the Kiel canal, returning, viâ Henrischenburgh, to examine the ship lift from the Dortmund canal to the Elbe, where the difference of 50 ft. between the level of the two waters is worked n a most economical manner, and will probably serve as a model for the lift necessary for the proposed canal at a difficult point near Naurouze.

The text of the resolution passed by the Commission of twenty-two members nominated by the Minister of Public Instruction and of Fine Arts, to study the creation of special schools of architecture in the provinces is as follows:—"There is urgent necessity for the creation of a certain number of regional schools of architecture in some of the important centres, especially university towns already possessing a certain programme for teaching the three arts. These regional schools of architecture should be constituted in a manner similar to that of the Ecole Nationale des Beaux Arts at Paris section of architecture, with the difference that the future schools shall not possess any of the official *ateliers d'architecture*. The terms of admission and the system and programme of studies shall be alike and common to all the various new schools. The Higher Commission of the Ecole Nationale des Beaux Arts at Paris shall form the general central commission for the future schools in order to assure an equitable control over the provincial teaching." It is expected that the new law will be brought up before Parliament at its next session and rapidly passed.

There is certain trouble with regard to the application of the system of the *tout à l'egout* at Paris, the recent law for which constrained all householders in certain quarters to install this system in their properties by a certain fixed date. About 800 house-owners have not yet done their duty in this respect, and have been arraigned by the Prefect of the Seine before the courts of law. Ten landlords have been called up for the purpose of deciding the case, but the houseowners bring forward in defence that the Town has not given satisfaction itself with regard to the terms of the law of 1894, notably as regards the supply of the quantity of water necessary for this system of drainage, and the necessary pressure for giving a proper supply of water to the upper stories of the buildings, adding also that the spreading grounds outside Paris have not yet been extended to the superficies necessary for the proper disposal of the sewage from the *tout à l'egout* system. The matter has been adjourned to the first week in August.

A Museum of Health and Sanitation will shortly be installed on the Quai des Celestins, and will contain, in the form of documents, drawings, and models, the history of dwellings in France from the twelfth century. An important section of the museum will be given up to plans and details of systems of irrigation, elevatory machines, drainage apparatus, and the various apparatus employed on the sewage farms. Another section will comprise everything relating to heating, ventilation, and the proper sanitation of dwellings.

The number of buildings entered this year for the competition called Concours de Maisons at Paris is considerably less than that of the previous competitions. The competitions of 1888 and 1889 comprised each about sixty houses; that of this year will comprise thirty-nine only, and this falling off may be attributed to the fact that very few houses comparatively were erected in 1900, the year of the Exhibition.

The rather daring liberty taken by M. Tony Garnier, one of the Prix de Rome students at present going through his course of studies in Italy, in sending as his share of the students' contributions a scheme for a "Cité Industrielle" (as mentioned in the last letter), seems not unlikely to lead to a reconsideration of the whole subject of architectural study. M. Tony Garnier affixed to his drawings the following drastic piece of criticism:—"Like all architecture based on false principles, ancient architecture is an error. Truth alone is beautiful. In architecture, truth is the result of calculations made to satisfy known necessities with known methods." M. Stanislas Ferrand, the Chief Editor of *Le Bâtiment*, and Member of Parliament, proposes to bring up the matter at the next discussion of the Budget of Fine Arts.

The City of Paris is entering into negotiations with the view of establishing in the capital a National School of Arts and Trades. France possesses at present four national schools of this kind—at Aix, Angers, Chalons-sur-Marne, and Lille. The proposed school will be erected on a piece of ground measuring 20,000 square mètres, at present occupied by the slaughter-houses of Villejuif. The école will be constructed by the Department of the Seine, which will bear three-quarters of the cost, the State undertaking the remainder of the expense.

M. Adrien Mithouard is about to organise a Commission Archéologique for the Seine Department. This Commission will undertake the duty of making searches in the whole of the Department de la Seine—Paris excepted—for all vestiges of ancient art, and is then to class these remains, examine their present state, and do what is necessary to preserve them, and follow up the researches and excavations which may be made in view of bringing further remains to light. The Commission will be divided into four sections, each section comprising ten members chosen from amongst well-known local archæologists.

The monument to the late M. Charles Garnier, architect of the Opera House at Paris, is at present being erected within the court-yard of the Opera, just in front of the rotunda of the Bibliothéque, under the direction of M. Pascal, architect, and an old friend and colleague of Charles Garnier. The State wishing to participate in the homage done to the late architect, has offered to contribute a portion of the granite and marble for the construction of the monument, and has allowed M. Pascal to choose and select any blocks of stone he desired from the State deposit of marbles on the Quai d'Orsay. It appears that M. Pascal has chosen a certain number of the large blocks of granite which were ordered from Corsica in 1806 by Napoleon for the construction of the pedestal of the Vendôme column at Paris.

M. Eugene Guillaume, Director of the Academie de France at Rome, has just remitted to the Academie the further twenty inscriptions from the ruins of Palmyra sent him by M. Bertone, late Prix de Rome student in Italy, who carefully explored the ruins of Palmyra in 1895, and sent home a large number of interesting inscriptions, which he intends forming into a complete work very shortly, a work which promises to be of very great interest to archæologists.

The election of a new corresponding member of the Academie des Beaux-Arts to take the place of the late M. Revoil, was the subject of a keen competition between M. Batigny, architect, of Lille, and M. Beltrami, of Milan, resulting in the election of M. Batigny, whose best known works of architecture are in the north of France, notably the Ecole des Arts et Métiers at Lille.

The Institute has awarded to M. Jacquot Defrance, pupil of MM. Bonnat and Albert Maignan the Grand Prix de Rome in painting. In sculpture the subject given was "Œdipus and his daughter Antigone leaving Thebes pursued by the maledictions of the people." M. Henri Bouchard, to whom the principal prize has been awarded, has shown both dignity and pathos in his treatment of the subject. The young sculptor, who is already an accomplished artist, is a pupil of M. Barrais. The prize in architecture is not yet awarded. The Académie des Beaux-Arts has also given its award for the Troyon prize for a cattle and landscape subject, for which there have been sixty-four competitors; the prize has been awarded to M. Jacques Camareyt. The Académie has elected as corresponding members, in the section of painting, MM. Sorolla and Bastida, of Valence, and in the section of sculpture M. Constantin Meunier, a Belgian sculptor, and Mr. Onslow Ford of London.

The five scholarships of 48*l.* each, awarded each year by the Conseil Général de la Seine to young artists without means whose work shows promise of great talent, were given this year to MM. Louis Biloul, painter; Auguste Cornu, sculptor; Jules Baucour, architect; Louis Collin, sculptor; and François Flament, sculptor. The mention accompanying the award to M. Baucour was most flattering to the assiduity and talent of the young architect.

The Prix Houllevigne of a value of 200*l.*, destined to recompense the author of a remarkable work in one of the arts produced during the past four years, has been awarded to M. Humbert, painter, for his decorative paintings in the Panthéon at Paris.

On the occasion of the annual national fête, the Government conferred on M. Harpignies the rank of "Commandeur" in the Legion of Honour. The venerable artist, who is now eighty-two years of age, was created "Chevalier" in 1875, and "Officier" in 1883. He is one of the glories of the French School of Art, and has pursued an unbroken career of success, never falling below the high standard which he has marked out for himself, and is still painting with all the freshness and power of a young artist. Four years ago the Société des Artistes Français awarded him the medal of Honour of the Salon, as the last and highest recognition of his genius and of his sustained greatness of style as a landscape painter. He made his first appearance at the Salon in 1853, and has regularly exhibited every year since then.

COMPETITIONS.

FROGNAL PRESBYTERIAN CHURCH (CORNER OF FINCHLEY-ROAD AND FROGNAL-LANE).—The committee of this church invited a limited number of architects to submit competitive designs for this church, and three premiums of 50*l.*, 30*l.*, and 20*l.* were to be paid to those architects whose designs were placed respectively first, second, and third by the assessor. The committee appointed Mr. J. Macvicar Anderson, F.R.I.B.A., of London, as their professional advisor and assessor. Mr. Anderson has now made his report, and has awarded the premiums to the following competitors, namely:—First place and premium of 50*l.* to Messrs. William A. Pite and R. S. Balfour, London; second place and premium of 30*l.* to Mr. A. O. Breeds, architect and surveyor, London; third place and premium of 20*l.* to Mr. W. Gillbee Scott, London.

THE CITY CREMATORIUM.—The City Engineer, Mr. D. J. Ross, has at the request of the Sanitary Committee prepared plans for a crematorium at Ilford. The plans provide for a chapel, having an entrance porch and one catafalque. The cremating chamber, which will be at the rear of the chapel, will admit of two cremating furnaces being erected. The building will have a flat roof with stone parapet. The furnace flue will be arranged in the centre of the tower, which will form a feature in the buildings, and will be about 80 ft. in height. The crypt or columbarium under the chapel will be fitted up for the reception of the urns, and the various monuments can be attached to the walls on niches. The estimated cost will be about 10,500*l.*

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THE ANNUAL EXCURSION OF THE ARCHITECTURAL ASSOCIATION.*

Wednesday.

THE clouds of the preceding days, which had then proved grateful rather than otherwise, on this morning developed into rain, which continued practically for almost the whole of the day. The places which were to be visited lying at some considerable distance from headquarters, the railway was taken to Tetbury station, where carriages were entered, and a short drive brought the party to Doughton, which must be credited as one of the triumphs of the organising secretaries of the excursion, Mr. H. Talbot Brown and Mr. A. W. Hennings, for here was found a delightful and almost unknown manor house and farm, as well as other interesting houses. The manor house is a typical seventeenth century Gloucestershire example of not very great size, but exceedingly picturesque, stone built, with numerous gables, of which, indeed, there is almost—to be critical—a superabundance for a perfect design. The house appears to be seventeenth century in date, and although the interior has been considerably modified and, to a certain extent, spoilt, there still remain a handsomely panelled room with very good chimney-piece on the ground floor, now used as the kitchen, but probably originally a parlour, and on the first floor above this room an equally interesting bedroom or chamber. Both of these rooms, which are at one end of the house, have bay windows, which add to the charm of the interior as well as to the picturesqueness of the exterior. Not only is the house in itself abundantly worth study, but an enclosed garden in front with well-designed entrance piers towards the road, and another enclosed garden at the back with the remains of stone summer-houses or gazebos, and a yew arbour are still sufficiently in evidence to mark out the original scheme. The farm buildings around the house are many of them contemporary with it and picturesque and piquant beyond the actual utilitarian necessities of their functions. Such a treat as this house proved to be fired the enthusiasm of the members, many of whom braved rheumatism and other ills by sitting out sketching in the pouring rain—in fact, the majority of the members spent so much time at the manor house that they were unable to visit the less important but more artistically satisfactory seventeenth-century house near by with front towards the street, with its three gables and projecting bay over a domed porch, combined with mullioned windows, old weather-stained, rough-cast, and steep-pitched slate stone roof, forming a combination which on a sunshiny day would send into ecstacy any sketcher with a colour-box and the time to use it. Nor did this house exhaust the wealth of the village of Doughton, for opposite the last-mentioned house is another, inferior, no doubt, in interest, but with an eighteenth-century door that is not unworthy of some attention.

From Doughton, to the accompaniment of more rain, the excursionists proceeded to Malmesbury, whose ancient abbey was, of course, the chief attraction with its remarkable doorway, of which we gave a two-page illustration last week. The abbey of Malmesbury has been fully described and illustrated in our series of the abbeys of England, and we need not, therefore, repeat the particulars we then gave. Not the least entertaining of the incidents at Malmesbury was the explanation of the west doorway given in quaint Wiltshire brogue by the verger, one of the freemen of the ancient town, amongst whom is divided the estate of 800 acres given in perpetuity by King Athelstan, and known as the Common of King's Heath, in recognition of the bravery of the men of Malmesbury and the valuable assistance they rendered him in gaining a victory over the Danes.

A visit was also paid to the Elizabethan house built on the substructure of part of the abbey buildings, which may possibly have been the abbot's house, and of which the crypt still remains. Within this building is a good panelled room of the early seventeenth century, with an earlier fireplace and stone arch. The house is now being carefully adapted as a modern residence under the direction of Mr. George H. Selby.

The final visit in Malmesbury was made to the market house, erected in the time of Henry VII., octagonal in form, with angle piers and buttresses, and rib and panel vaulting internally of good design.

From Malmesbury the party proceeded to the final visit of the day, Charlton Park, now the property of Lord Suffold, one of the notable examples of the Early Renaissance in England of which the oldest part was built by Sir Thomas Knyvet in the time of James I. The west front, illustrated by us last week, is attributed to Inigo Jones. The east front was added in 1773 by Henry Lord Suffold, Secretary of State in the time of the American war, and at the same time the hall was probably erected or modified into its present form by the enclosing of the internal courtyard. The long gallery remains intact, but the greater part of the interior has been modernised, and its chief attraction, therefore, now consists in the fine collection of pictures contained in the house.

Thursday.

Another wet morning, with the rain continuing nearly the whole day, made the proceedings decidedly uncomfortable. The railway was again taken to Tetbury station, whence the first drive was to Beverstone, where the church and castle were visited and studied. The church, dedicated to St. Mary, consisted of a nave and south aisle, chancel, north transept or chapel, south porch, and western tower, and is principally of transitional date, with an excellent arcade between the nave and aisle, but unfortunately the church was "restored" without discretion some sixty years ago. As an example of the manner in which this "restoration" was effected, the architect's description of the treatment of the Norman font is instructive; he describes it as having been "squared into neatness." This is a correct account, and naturally all character has been lost. Another exploit of the same worthy was the removal of the rood screen and the construction therewith of summer-houses in the rectory garden; needless to say in such a situation it fell into lamentable decay, but has been admirably repaired and replaced in its proper position under the direction of Mr. Waller, of Gloucester. The date of the screen is very late, probably between 1490 and 1510. There were formerly many wall paintings in the church. The records of most have been lost, but a sketch of one, dated probably between 1390 and 1400, which was formerly in the chancel has luckily been preserved, and apparently represents the entombment and the vision of Pope Gregory justifying the doctrine of transubstantiation.

There are several monuments in the church worthy of notice, and an organ by Father Smith, whose tone the visitors were enabled to appreciate by the skill of one of their number.

The castle is a beautiful ruin, the remains of a stronghold erected by Thomas Lord Berkeley in the reign of Edward III., which after repeated sieges was taken and burnt in the early part of the Parliamentary war. The last stand of the defenders is said to have been made at the entrance to the priest's oratory, the proof of which tradition is supposed to be furnished by what certainly do appear to be very like sword-cuts in the stone jamb.

This oratory has also interesting features in the hagioscopes which open into a larger room, said to be the guard room, and a smaller chamber said to be that of the officers. In addition to this oratory there is also in very fair preservation the chapel, with two sedilia and piscina of good design. The chapel is vaulted in one square compartment and a waggon-vaulted bay, which forms the sanctuary.

The south side of the chapel has a curious cusped-headed shallow niche which puzzles antiquaries, and which, it is suggested, was occupied by a life-size figure or painting representing the Virgin.

From Beverstone the President walked across the fields, whilst the rest of the members drove by a longer route along the road to Chavenage, halting on the way for a few minutes to glance at the famous barn at Calcot, which, however, has architecturally lost the greater part of its interest by being reduced to little more than half its original size, and by the fact of its having been burnt, as an inscription records, on October 9, 1728, after which it was repaired, at the expense of T. Estcourt, Esq., by John Pill, carpenter, who finished the work on October 17, 1729.

The Manor House at Chavenage was originally built in 1576 by Edward Stephens, but was apparently considerably modified in 1684 by Richard Stephens, and since his time by other members of the Stephens and the Chaplin families, so that now it is rather a jumble that does not do justice to the original design. Many insertions that appear to have been made by Richard Stephens are clearly from an earlier building, and probably bits from Horsley Priory. The shield over the front door is also most likely imported from some other situation, whilst the screen in the hall was, there can be little doubt, made up of imported materials at some date subsequent to the original erection. Apart from the hall, the room now used as a dining-room is the richest part of the interior, the walls being panelled, with a good chimney-piece. Amongst the collections which go to make up the interest of the house may be especially mentioned the tapestry, particularly that in what is called Oliver Cromwell's room, and numerous fragments of stained glass, principally Dutch. The little church adjoining the house has a picturesque tower, but otherwise is not of great interest, and the date of its erection appears to be a matter of considerable doubt. An excellent and judicious paper by Mr. W. H. Seth Smith, the President of the Association, has been published in the transactions of the Bristol and Gloucestershire Archæological Society.

From Chavenage the excursionists returned to Tetbury, where sufficient time was allowed them to wander round the town and sketch some of the many picturesque old houses therein contained, and especially the market hall, with its sturdy Doric columns and upper chambers. The church, which from a distance appears to be a striking feature of the town, was built in 1781, and on a near inspection presents a hideous instance of the ignorant handling of Gothic detail. The tower and spire have been recently somewhat improved in this respect, but the main body of the church still remains an awful example, which, however, judging from the effects of time on its shoddy construction, is destined at no very future date to completely collapse unless rebuilt. When one, however, realises that the cost of the erection was only £6,000, it is a matter for wonder that so much show and so large a cubical capacity were obtained for the money.

From Tetbury the members returned by train to their headquarters at Cirencester.

Friday.

Friday morning broke fine with a promise of fairer weather for the day, a promise, however, which was not completely fulfilled, being marred by an echo of the remarkable thunderstorm that had visited the metropolis on the previous day. The first village visited was Barnsley, where a short stay was made at the little church and picturesque village. Like many of the churches in the district, this is evidently of an early date as evidenced by the transitional chancel arch, and by the remains of still earlier work which have been incorporated in the modern vestry, and which appear to be of eleventh century workmanship prior to the Norman invasion. The corbel course in the eaves of the chancel is also an indication of the early date of the fabric. The church is small, suited in that respect to the village over which it stands, but in its picturesqueness thoroughly in keeping with the surrounding cottages and small houses. The main point in the composition of the church is its small western tower, being merely some 14 ft. or 15 ft. square at the base and without buttresses, but with a distinctly evident batter, and surmounted by a parapet and four small gables of Elizabethan date.

Leaving Barnsley, the excursionists proceeded to Bibury, where the greater part of the day was spent, the church being first of all visited. This is of considerable size, particularly for the early date at which it was evidently erected. The chancel is very long, early English in date, and what may possibly be an Easter sepulchre rather than an aumbrye is to be seen on the north side. The nave arcades are of Transitional character, whilst the chancel arch is one of those interesting examples which by the character of their carving show the maintenance of Celtic tradition even to the end of the twelfth century, a point which is still further emphasised by the noticeable narrowness of the chancel arch, which even now is only 9 ft. wide, although opening into a chancel 15 ft. wide and a still wider nave. The appearance of the jambs and particularly of the mutilated carving, seems to indicate that

* Concluded from last week.

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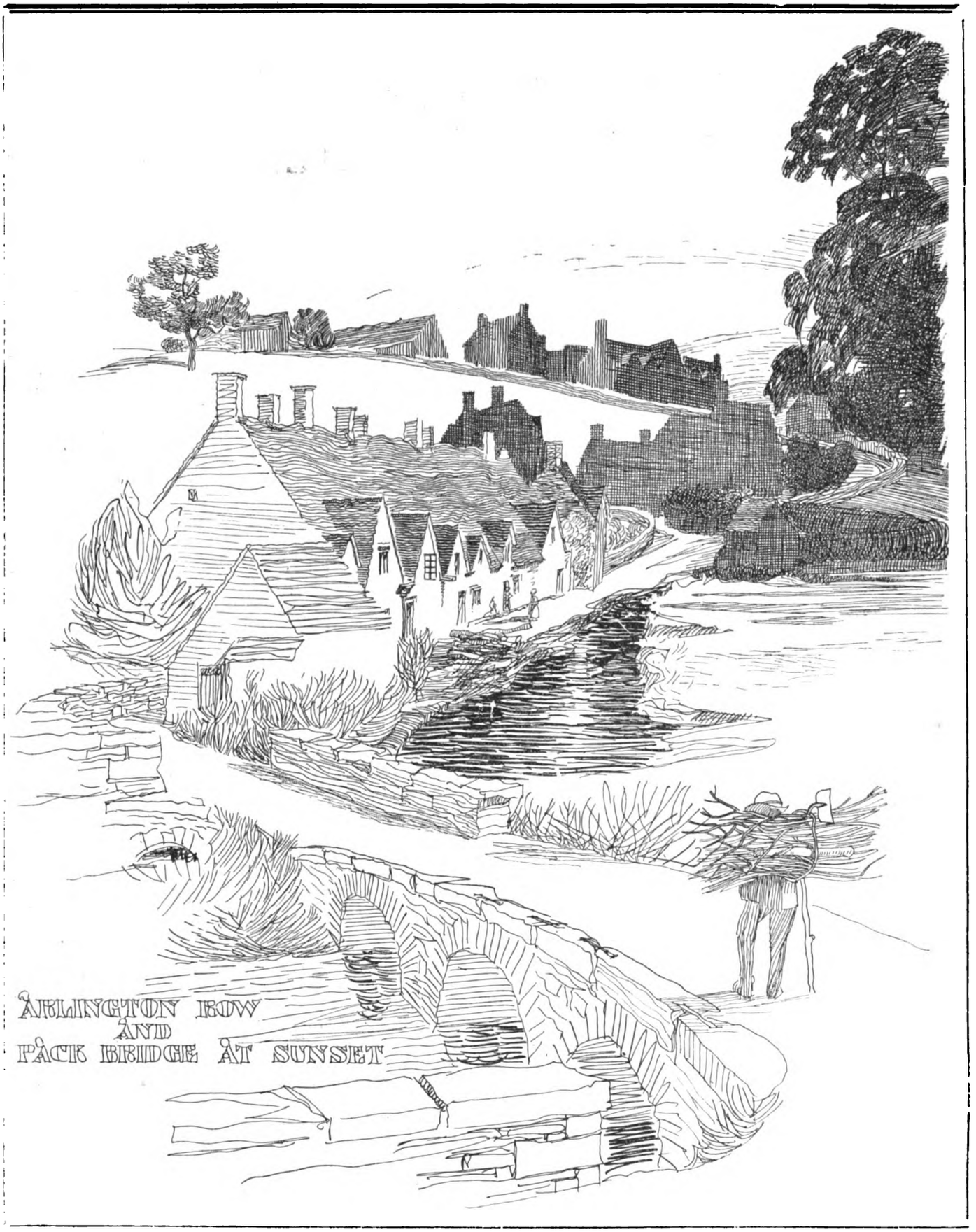

ABLINGTON ROW AND PACK BRIDGE AT SUNSET

the width of 9 ft. is an enlargement from the original dimensions. The church possesses north and south aisles, with a piscina and arches for wall tombs in each. That in the south aisle still possesses a tomb with floriated cross, although much mutilated. There are many eighteenth century wall tablets and insertions made in Decorated and Perpendicular times. The tower of this church is in a somewhat unusual position at the west end of the north aisle.

From the church the excursionists passed on to the adjoining house, known as Bibury Court, which was probably originally erected by the Cresswells in 1633. The original house, however, has been considerably altered by subsequent additions, of which the period is presumably indicated by the date of 1759 on the lead ramivater heads of the south front. Internally the house does not possess a great deal of interest, but its exterior setting, with the picturesque river Coln and the wonderful background of trees on rising high land, make Bibury in the sunshine one of the most charming spots it is possible to conceive. With Bibury were included in the day's programme the adjacent Tythings of Arlington and Ablington. Arlington for its picturesqueness, Ablington for its Manor House, erected at the close of the sixteenth century, as it would appear from the following inscription which remains over the front door:—"Plead. Tho | v. my. cause. | O. Lord. by | Jhon. Cox | wel. Ano | Domeny | 1590."

The house was originally a very small one, and has only been made of a passable size by the enclosure of the court yard between the originally projecting wings. This was filled in in the eighteenth century. Internally, the charm of the house rests rather with the collection of seventeenth century furniture, engravings, pewter, and other domestic bric-à-brac.

Ablington completed the day's programme, and the members returned to their headquarters at Cirencester, where in the evening was transacted the usual formal business of electing the committee for the ensuing year, and the discussion of possible centres for the next excursion.

Saturday.

The only work done on this, the last morning excursion, was a visit to the beautiful and highly-interesting church of St. John the

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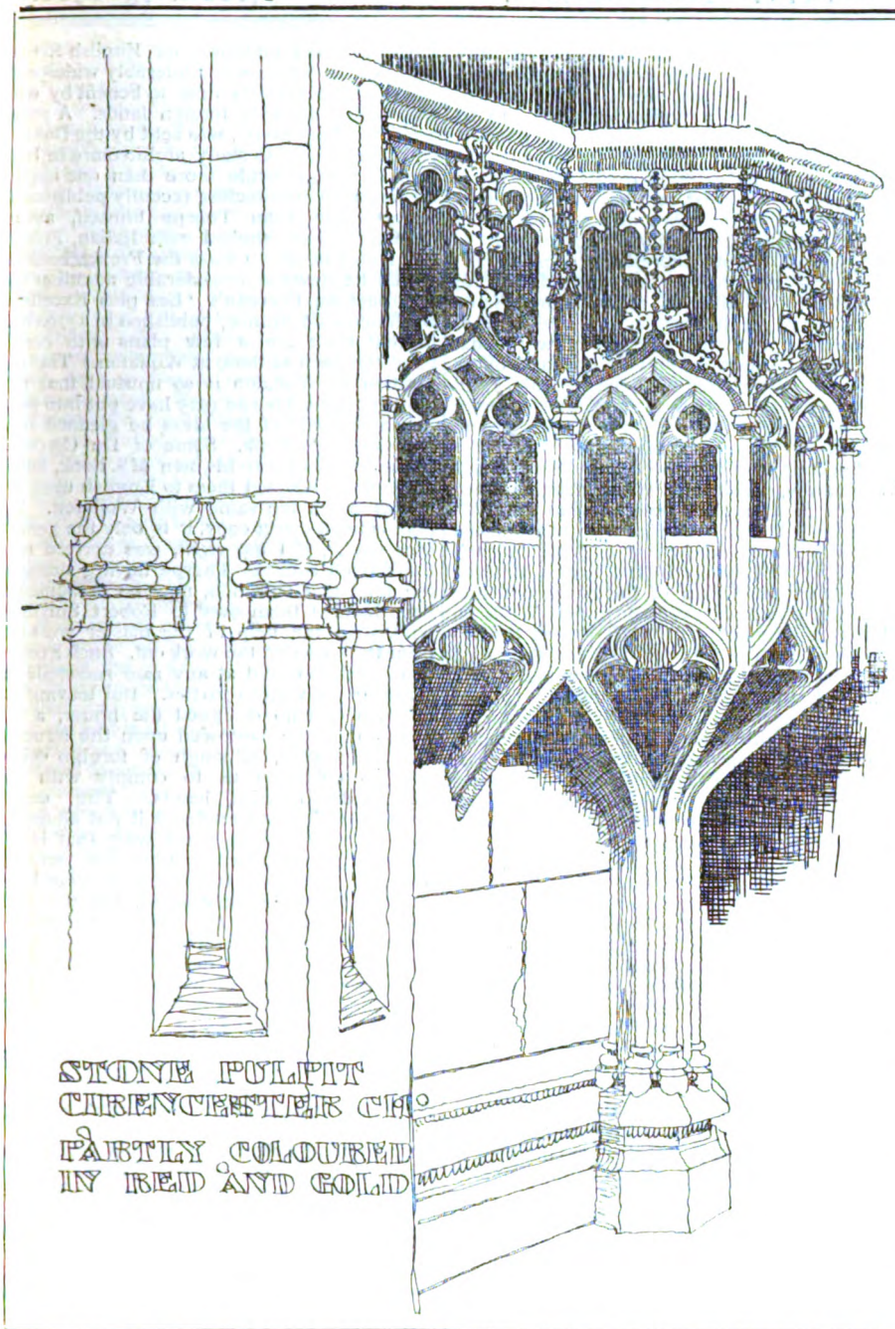
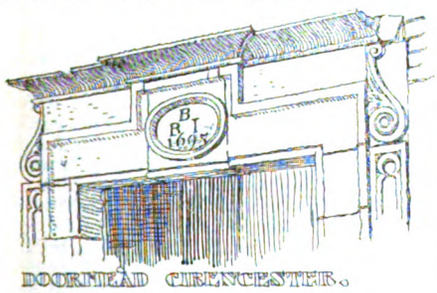


STONE PULPIT CIRENCESTER CH.
PARTLY COLOURED IN RED AND GOLD

Evangelist, a fifteenth century building with several chapels, and much that is worthy of study, old glass, wood-carving, colour decoration, particularly a beautiful St. Christopher, an original stone pulpit and ancient needlework, in addition to the more strictly architectural work. The remarkable parish-room, over the south porch, which is so striking a component in the grouping of the church, was rebuilt, according to a tablet within, at the early part of the nineteenth century, but this rebuilding was remembered by the parents of still living townsmen, and consisted of the taking down, numbering, and re-erecting, stone for stone, of the upper part of the building, which, therefore, is the original work.



DOORHEAD CIRENCESTER.

THE REBUILDING OF THE OLD BAILEY.—Mr. Ross, the City Engineer, replying to questions at the meeting of the Corporation of London on the 25th ult., said nothing further had been done in reference to the rebuilding of the Central Criminal Sessions House, and no steps had been taken towards widening Newgate-street to a thoroughfare 60 ft. wide.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT NOTTINGHAM.

FOR the first time in an existence of nearly sixty years the Royal Archæological Institute has this year selected Nottingham as the place of its annual meeting. Though not now of much interest from an archæological point of view, Nottingham is of great importance historically, while the country round teems with buildings of antiquarian value.

That the selection of Nottingham was a popular one is shown by the fact that over one hundred members of the Institute have taken part in the meeting.

The proceedings opened on Tuesday, July 23, in the Exchange Hall, when the Mayor, Mr. F. R. Radford, wearing his gold chain of office, welcomed the Institute to Nottingham, and spoke of the many interesting and historical associations of the city and neighbourhood. Lord Hawkesbury, F.S.A., as President of the meeting, then delivered an address on the history of the numerous religious foundations in Nottinghamshire and of their fate at the Suppression, *temp.* Henry VIII. Sir Henry Howorth, K.C.I.E., F.S.A., in a few appropriate words proposed a vote of thanks to the mayor and to Lord Hawkesbury, and the proceedings then terminated.

After luncheon the party reassembled in St. Mary's Church, a fine cruciform structure, with massive central tower, mostly of the opening years of the sixteenth century, though the chancel may be somewhat earlier. The history and chief features of the building were pointed out by Mr. W. Stevenson, who was of opinion that the date of erection was about 1380. The church has undergone several "restorations," with the result that no old fittings remain, but two ancient monuments have been spared, probably from their being out of the way against the end walls of the transepts. The one consists of a late fourteenth century alabaster effigy of a civilian beneath a rich stone canopy of the date of the church. The other is a slab with the matrix of a brass, resting on a fifteenth century alabaster tomb with figures of saints and blank shields, also beneath a rich stone canopy. In a glazed recess in the chancel wall is a small sculptured panel of alabaster representing an archbishop doing homage to a pope.

The church of St. Peter was next visited, under the guidance of Mr. Robert Evans, F.R.I.B.A. The chancel here has been rebuilt, but the nave has arcades on the south of good thirteenth century work, while that on the north is a century later. A curious division in the south arcade, which consists of three arches, and two others to the west, is suggestive of the latter having formed part of the old north arcade used up again to lengthen the nave when the present north arcade was built. The aisles, clearstory, and the western tower and spire are all late fifteenth century. The flat nave roof is of good character with armorial bosses with the arms of the Strelley family and others. The south doorway, now disused, retains an ancient door with traceried panelling.

A move was next made for the castle, where Mr. Emanuel Green, F.S.A., read a paper on its history from the earliest times down to its destruction in 1651. Of the ancient castle little else is left than the outer gatehouse, a wreck of a fine Edwardian example, and one of the drum towers of the lower bailey. The present "Castle," as is well known, is the fine mansion begun by the Duke of Newcastle in 1674, and burnt by the mob during the Reform Riots in 1831. It has since been acquired on a long lease by the city, and converted into an art gallery and museum.

After a visit to the caves in the Hermitage Grounds the proceedings terminated.

In the evening a meeting was held in the Exchange Council Room, when the chair was taken by Dr. Gow, the headmaster elect of Westminster School, and Mr. Arthur F. Leach, M.A., F.S.A., gave an interesting account of the ancient schools of Nottinghamshire, with special reference to those of Southwell, Newark, and Nottingham.

On Wednesday a special train conveyed the party to Southwell. Here the remains of the ancient palace of the Archbishops of York were first visited, under the guidance of the Rev. R. F. Smith, who as vicar-choral is the last surviving member of the old Chapter of Southwell. The present hall, which was restored under the direction of Mr. Bodley by the late Bishop Trollope, and presented by him to the See, is a fine example of the fifteenth century, with a good open roof of four bays. This hall seems to have formed the great chamber at the north end of the great hall of the palace, some remains of which were pointed out by Mr. Smith, including one of the window jambs and the doorways at the south end opening from the screens into the kitchen, buttery, and pantry. Of the buildings forming the other three sides of the quadrangle only the much-ruined outer walls are left.

This noble minster* was next inspected under the direction of the Rev. G. M. Livett, who first led the party to the west of the church and pointed out the chief features of interest of the west front with its two Norman towers, the Norman north porch, &c. There might be differences of opinion, he said, as to the recent restoration of the timber and lead spires on the western towers, but it was difficult to justify the substitution of sham Norman windows in the lowest stories for the fourteenth-century windows that preceded them, especially since it was unlikely that there were any windows there originally. Sir Henry Howorth, as President of the Institute, commented on the tendency of architects to alter the forms of buildings which they restored, with the result that all sorts of falsities and incongruities were perpetrated. Archæologists, he said, did not complain of the taste or good intentions of restorers, but they asked that during restoration ancient buildings should not be altered, but simply repaired, in order that they might be preserved in their beautiful entirety to posterity. A further illustration of Sir Henry Howorth's remarks was

* A plan and description of Southwell Minster appeared in the *Builder* for July 2, 1892.

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seen on entering the church, the former flat and appropriate wooden ceilings having been replaced by incongruous open timber roofs,and Bernasconi's rich plaster stall-canopies destroyed to make way for mean wooden panelling. In the north transept Mr. J. T. Micklethwaite described the curious alabaster effigy, formerly in the presbytery, of Archbishop Sandys, one of the straitest of the Puritan faction, who died in 1588. Nevertheless, he was shown wearing a cassock, a girded albe, and a chasuble with a long train behind, which was no doubt carried by a page, and over all a doctor's hood. The head was modern. Mr. C. R. Peers also contributed a few remarks on the supposed Saxon carving over the turret door, which is actually a re-used Norman tympanium shortened at one end. In the choir a discussion took place as to the original eastern termination, which has been generally assumed to have been square, from the discovery during the last restoration of a massive foundation between the central pair of pillars. No effort seems to have been made to search for a possible apse east of this, and Mr. Brakspear contended that the present evidence was insufficient, since the foundation uncovered might be merely a sleeper-wall to carry the gable. The inspection of the building was completed by a visit to the incomparable chapter-house, where a cordial vote of thanks was accorded to Mr. Livett for his instructive explanation.

After luncheon the members went in brakes, amidst a discomforting shower of rain, to Thurgaton Priory, where the history and remains of the buildings were described by the Rev. J. Standish. The priory was founded about 1130 by Roger Deincourt for Augustinian Canons, but nothing is left of the first buildings, the remaining portion being three bays of the nave arcades and the northern of two western towers, all of the first half of the thirteenth century. Under the house that adjoins the church, rebuilt in 1777, is a range of groined cellarage of the same age as the nave, that anciently formed the sub-vault of the western range of the priory buildings. The church was brought to its present state in 1854, when the chancel was rebuilt, partly out of old work, and an aisle added to the nave on the north side. Three of the old stalls with misericords are used as sedilia, and the altar slab is the old one restored to use. After a few remarks by Mr. Hope on the constitution of the priory, the party re-entered their conveyances and drove home to Nottingham.

At the evening meeting the Rev. A. D. Hill read a paper on some ancient carvings in Calverton Church, Notts., now built into the tower. Mr. Hill showed from casts and rubbings that the stones were a set of voussoirs of an arch with representations of the months, most of which could be identified. Mr. W. H. St. John Hope followed with a paper on the early working of alabaster in England, in which he dealt with all the documentary matter on the subject down to the middle of the sixteenth century. From a comparison of a large number of photographs and engravings he showed that there were several groups of effigies which certainly emanated from a common centre and that many of the knightly figures with orles round the bascinet were probably the work of Thomas Prentys and Robert Sutton, of Chellaston, "Kervers," who made the fine Green tomb at Lowick, Northants, in 1419. The same craftsmen seem also to have wrought the Arundel tomb at Arundel and that of Henry IV. and his queen at Canterbury. Mr. Hope submitted as a working theory that the majority of the early alabaster monuments in this country were wrought at Chellaston, in Derbyshire, where the principal mediæval alabaster pits were, but that the smaller statues and sculptured panels of which so many examples are known both in England and abroad were the work of the "alablastermen" of Nottingham and York, whose fame, so far as regards the former place, had spread abroad as early as the end of the reign of Edward III.

Thursday, the 25th, was devoted first to an expedition to Wollaton Hall, where the members were graciously received by Lord and Lady Willoughby. After an examination of the principal apartments the party assembled in the Great Hall, where Mr. J. A. Gotch read the following paper on the house:

"Wollaton Hall is sometimes quoted as a typical example of the work of the English Renaissance. Those who are in sympathy with that phase of domestic architecture point to it as a magnificent specimen of an Elizabethan palace. Those who are out of sympathy direct the finger of scorn to its extravagancies and its pretentiousness. As a matter of fact, it cannot be called a typical example. In its chief characteristics it stands by itself, namely, in its lofty central hall and its four-corner pavilions. In its extreme regularity of treatment, and in the great care bestowed upon its detail, it exhibits far more of conscious effort in design than the majority of houses built at that period, or of their method of work, that the field of conjecture is a vast one, and offers scope for manœuvres on a large scale. But there are one or two facts connected with this house which help us to a certain extent. We know from the inscription over the garden door that it was built by Sir Francis Willoughby, constructed with uncommon art, and left as a precious possession to the Willoughbys. It was begun in 1580 and finished in 1588. We also know that in John Thorpe's collection of drawings in the Soane Museum there is a ground plan of the house and half the front elevation. We also find in Wollaton church a monument to 'Mr. Robert Smythson, gentleman architector and surveyor unto the most worthy house of Wollaton and divers others of great account,' who died in 1614, at the age of seventy-nine. Lastly, we learn from Cassandra Willoughby, Duchess of Chandos, who wrote an account of the house in 1702, that Sir Francis Willoughby sent for the master workmen who built the house out of Italy, and also for most of the stone figures which adorn it. Here, then, we have apparently a number of conflicting claims. No one, however, contests with Sir Francis Willoughby the honour of having built the house, in the sense of having ordered and paid for it. Nor is its date in question. But there are three claimants to the honour of having designed it, namely, John Thorpe, Robert Smythson, and the master workmen out of Italy. First, as to the latter. There has long been an idea very prevalent that the houses of Elizabeth's time owed their special characteristics to Italy and to Italian workmen; and so, in a way, they did, because Italy influenced more or less directly the work of the Renaissance in all other countries. But, as a matter of fact, it is extremely difficult to trace anything but a very small amount of English work to actual Italian hands. The whole tendency of recent inquiries goes to show that it was English hands which executed most of the work which has an Italian appearance. The tales of models having been sent for from Italy for English houses are, I think, apocryphal, because the plan of an English house differed widely from that of an Italian; and although I am not prepared to say that Cassandra the Duchess was wrong, still the master workmen who were sent for out of Italy could have had very little to do with the designing of Wollaton. The chief credit for that performance I am inclined to give to John Thorpe, and I reconcile his claims and those of Robert Smythson by regarding the latter as the chief workman and clerk of the works or surveyor. It must be remembered that, although the same terms are used now as were used then, the meaning of them has changed. We find a number of men described as 'architectus' or 'architector,' who were what we should regard as master masons, and that is what I think Mr. Robert Smythson was. But it must also be remembered that the relation of the master mason to the architect was then very different from what it is to-day. The architect to-day designs everything himself; in those days he seems only to have given a general idea of what he wanted, leaving the detail to be developed by the master mason. The latter might, therefore, well take credit to himself, or his sorrowing family for him, as being the architector to a house like Wollaton. The actual origin of the idea of the house I attribute to Thorpe. He claims nothing for himself, he only leaves certain drawings behind him. The full chain of reasoning would be too long to bring before you now. I will only say that the two drawings in question are by Thorpe's hand, and that being very like Wollaton as we see it to-day, and yet not exactly like it, the most reasonable conclusion to come to is that these sketches of his were altered somewhat in the course of execution. But there is one point in connexion with them which bears forcibly upon the question we are now dealing with, namely, the source whence the ideas which underlay our English Renaissance came. There was a tolerably widespread desire in Elizabeth's time to benefit by what was being done in foreign lands. A young architect, John Shute, was sent by the Duke of Northumberland to study architecture in Italy. Lord Burghley made more than one inquiry for books on architecture recently published in France, and John Thorpe himself, as his drawings show, studied both Italian, French, and Dutch books. One of the French books to which he devoted considerable attention was Androuet du Cerceau's 'Les plus Excellents Bastiments de France,' published in 1576. And in that book are a few plans with corner pavilions such as those at Wollaton. The disposition of Wollaton is so unusual that it is quite possible Thorpe may have put into practice here some of the ideas he gleaned from Du Cerceau's book. Some of Du Cerceau's plans he copied into his own MS. book, but in doing so he adapted them to English uses, and it was much the same with Wollaton. The plan is not a direct copy, it is only the general idea which, if I am right, was derived from the French source. Thorpe having designed the plan and elevation, may be presumed to have handed them over to Robert Smythson who, with the help of the master workmen from Italy, carried the work out. Such a course of procedure would at any rate reconcile the claims of the various parties. But leaving the question of who designed the house, a few words must be bestowed upon the structure itself. Its plan, although of foreign origin, was so contrived as to comply with old-established English habits. The central position of the hall rendered it not altogether easy of access in the usual way, that is into the passage at the end called the 'screens. The most direct way from the front door to the hall is that which now exists, but this leads into the middle of the side, not into the screens. Thorpe, therefore (for I will assume that Thorpe was the designer), kept his hall floor above the level of his front door, and led the visitor, not directly into the hall, but round to the right, and so, by way of a flight of steps, up to the end of the hall and delivered him into the screens in the usual way. The spare space not occupied by the stairs he devoted to the porter's rooms. A further reason for keeping the hall floor raised was that, contrary to the prevailing custom, he put his kitchen and servants' rooms down in a basement. This was almost a necessity of the design, for, being of a pretentious nature, it was obliged to be grand on every side, and the kitchen and inferior premises had to be hidden away in a basement in order not to spoil the symmetry of the four show-sides of the house. The disposition of the house, with a central hall surrounded by rooms two stories high, necessitated an unusual height for the hall, which is over 50 ft. high. Its window-sills also had to be above the roof of the surrounding rooms, and they are some 35 ft. from the floor. The upper floor of these adjacent rooms on the east side was devoted to the long gallery, but modern alterations, necessitated by constant use, have not only divided this up into a number of small rooms, but have effectually obliterated from the interior of the whole house all its Elizabethan character, except what remains in the basement and in the great hall. The fine stone screen remains here, and also the original roof, which is an excellent specimen of Elizabethan work. It has this peculiarity, that, though fashioned like an open hammer-beam roof, it supports in reality the floor of a large room over, called the prospect-room, which occupies the upper part of the central block that forms so conspicuous a feature of the house. It only remains to say that the house was entirely new from its foundations and that it occupied eight years in erection. There was apparently no building here before it, although very frequently we find Elizabethan houses enveloping remains of a humbler predecessor. The Willoughbys had lived at Wollaton for some generations previous to the building of the mansion, but their home was a house somewhere near the church. It has been suggested that the central block is earlier in date than that which surrounds it, but reflection shows that the hall must necessarily have been built in relation to the lower buildings round it. There is nothing to indicate any alterations of an older building; the detail of the central block, although different, is contemporary with that of the rest of the house, and the whole of it is shown on Thorpe's

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drawing. Everything, therefore, tends to prove that the whole house was built at the same time. Duchess Cassandra tells us that the stone was brought from Ancaster, and that the same pack-horses which brought it took back Sir Francis's coal in exchange. Notwithstanding that he got his stone for nothing, she says, and that labour was much cheaper in those days, the house cost Sir Francis 80,000*l.* The external treatment is of pronounced classic character, with plenty of pilasters and bold cornices. There are a number of circular niches, containing busts of classic personages, such as Virgil, Plato, Aristotle, and Diana. The master workmen out of Italy were presumably familiar with these celebrities, and so might have been Mr. Robert Smythson, gent., but the ordinary English workman must have been rather puzzled by them, and perhaps secretly relieved when he heard that a shipload of them had gone down, an accident that is said to account for some of the niches being empty. But, pace Duchess Cassandra, a good deal more assistance in English houses came from the Dutch than the Italians in the time of Elizabeth, and it would not be surprising if the building accounts, which are some day to be published, showed that Holland rather than Italy was the source whence some of the lower work was derived (in spite of the gondola rings which adorn the bases of some of the pilasters), as it certainly was the place where the curly gables of the pavilions had their origin."

Sir Henry Howorth returned thanks to Lord and Lady Middleton on behalf of the Institute in a graceful little speech, and to Mr. Gotch for his excellent paper, and, after an inspection of the outside of the Hall, the journey was resumed to Wollaton Church. This was described by the rector, the Rev. H. C. Russell, who pointed out the tablet in the south aisle to Robert Smithson, the "architector and surveyor" of Wollaton, referred to by Mr. Gotch. Mr. Hope followed with some remarks on the fine tombs to (1) Sir Richard Willoughby (ob. 1471) and wife, with brasses and a cadaver, in the north wall of the chancel, and (2) that on the south side of Sir Henry Willoughby (ob. 1528), with collar of SS. and knots, and small figures of his four wives. This tomb also has a cadaver beneath. The alabaster memorial of Matilda, wife of Sir John Dabrichecourt, K.G., who died in 1405, and described by Thoroton, has been destroyed. In the south chapel is an eighteenth century marble altar slab, supported by good wrought ironwork, brought from the almshouse chapel at Cossal, but believed to have originally been removed from Wollaton Church, where the elaborate altar-piece to which it might have belonged remains. Mr. Peers pointed out that the peculiarity of the west tower, which is built on arches close up to the road, was for the passage of processions that otherwise could not get round the church.

A move was next made for Sandiacre, where after luncheon the church was examined under the guidance of Mr. W. H. St. John Hope. It consists of a Norman nave with a small doorway, a large single window on each side, and a rich chancel arch. The western tower and spire are of the thirteenth century. The chancel is of fine and rich fourteenth century work, perhaps built by Roger de Norbury, Bishop of Lichfield 1322-1359, who held the prebend of Sandiacre from 1342 to 1347. All the window tracery and the parapets, &c., are new, but are believed to be copies of the old, which were "restored" in 1864. The sedilia are good examples, with rich canopies. A large early fourteenth century window has been inserted in the south wall of the nave to light the nave altars, and in the sixteenth century a low clearstory was added. The font is an ornate one of the fourteenth century. Mr. Hope referred to a scheme which has been proposed for enlarging the church by adding an aisle or aisles; but, while admitting the necessity for making room for the parishioners, he suggested as an alternative the building of a new church nearer to the town.

Amid a drenching rain, the journey was resumed to Strelley, a brief halt being made on the way to examine the remains of the cross at Stapleford, a monolith pillar covered with Saxon knotwork and carving. At Strelley the chief features of the church were pointed out by Mr. Hope. The lower part of the western tower, of the thirteenth century, is the oldest portion, the remainder of the church, consisting of a lofty nave of three bays, and a chancel with north and south transept-like chapels, having been all rebuilt about 1356, perhaps at the cost of Sir Samson Strelley, whose alabaster tomb with effigies of himself and lady stands in the middle of the chancel. Early in the sixteenth century a clearstory was added, and the tower raised a stage. The church retains a fine late rood-screen with the coving and rafters that carried the rood-loft. On the north of the altar is an alabaster tomb, with effigies, to Sir John Strelley, ob. 1501, and wife, Sanchia Willoughby, beneath an elaborate stone canopy from the same hand as one in Wollaton Church. In the chancel floor are several alabaster slabs and a brass to Sir Robert Strelley (ob. 1487) and his wife Isabel, sister of Cardinal Kemp.

At the evening meeting, Mr. C. R. Peers, M.A., F.S.A., read a paper on the "Saxon Churches of the St. Pancras (Canterbury) Type," which was illustrated by a comparative series of plans. Mr. W. H. St. John Hope also submitted a new reading of the Arms of Colchester and Nottingham, which he thought represented the ragged Cross of Our Lord pierced by three nails, each surmounted by a crown. This would explain the encircling of the cross by the third or lowest crown, even when, as in the Nottingham arms, the nails were now omitted. At Colchester the present arms have been used since at least the reign of Henry V., but for those of Nottingham there seems to be no earlier authority than the Visitation of 1569.

BRITISH ARCHÆOLOGICAL ASSOCIATION:

CONGRESS AT NEWCASTLE-UPON-TYNE.

(Continued).

Friday, July 19.

THE intense heat of yesterday, to which some of the party almost succumbed whilst perambulating the streets of Newcastle, was only slightly mitigated by a thunderstorm in the evening, and to-day the weather was very oppressive, as the archæologists travelled by train to Alnwick. At Alnwick station brakes and landaus were waiting to convey the party through the lovely park to Hulne, where the Carmelite Priory was described by Mr. George Patrick, A.R.I.B.A., hon. secretary. With the aid of a large plan spread on the grass, which every one could see whilst seated on the ruined walls, Mr. Patrick pointed out all the features of the church and monastery, and after relating the history of the order and its foundation at Hulne, preceded the party round the building. Hulne Priory is particularly interesting, owing to its remains being in a far more perfect condition than those of any other house of the Carmelite order in England. Its position is said to have been selected by the founders from the resemblance they fancied it bore to Mount Carmel in Palestine, from which the Order derived its name. About the year 1238, William de Vesci, Lord of Alnwick, and Sir Richard Grey, when in Palestine, visited Mount Carmel, where, to their surprise, they found countrymen of their own dwelling as Eremites, and among them a Northumberland man named Rodolphus Fresborn, whom they prevailed upon, with the leave of the superior, to return to England with them, upon the understanding that he should introduce the Carmelite order into this country. William de Vesci gave some twelve or thirteen acres in his park of Hulne for the site of the monastery, and, irrespective of the resemblance they fancied it bore to that of Mount Carmel, it is very probable the defensive capabilities of the situation commended themselves to the judgment of the warrior founder, for it is situated upon the summit of a lofty hill, with the river Alne flowing at its base and woods and forests surrounding it. The foundation of the monastery dates from about 1240. Fresborn became the first Prior, and Hulne is considered to be the earliest English house of the Carmelites, or "White Friars," as they were called, from the white scapulary they wore. The first general chapter of the order was held at Aylesford in 1245. The church consisted of a long and narrow nave and choir, without any structural division between them. Only the foundation remains of the north wall, which has a curious thickening inside about the middle of its length, where was a doorway opposite to the existing door leading into the cloister. This thickening measures 26 ft. in length, and is about 1 ft. wide, and the doorway is not in the middle, the greater length being to the westward. The late Prebendary Walcott speaks of a lady chapel being upon that side, but nothing remains above ground to identify it. There are remains of a foundation-wall at right angles to the north wall just at this spot, and it is possible this unusual thickening may indicate the position of a north porch and entrance to the lady chapel. There was no west door, and the lay folks and strangers must have had some way of access to the nave. The stone bench upon which they sat remains across the west end and returns along the south wall and on part of the north wall, where it is a foot or two above the ground. The west and south walls remain to their full height, the former having one long lancet window and a vesica-shaped window in the gable. The south side has three single-light trefoil-headed windows high up in the wall on account of the cloister roof, and there is an elegantly proportioned Early English sedilia of three-stepped bays. The sacristy retains the two stone corbels which supported the altar slab with an aumbry on the north side. There are two narrow square-headed windows over the altar, and in the south wall a plain pointed and chamfered piscina and a widely splayed square-headed window. In this wall there is a recess with a small flue running up, apparently into a larger one above. This recess the late Mr. Wallcott considered to be an oven for baking the sacred wafer. Over the sacristy was a chamber with a window looking into the church and a fireplace in the south wall. It was approached from the sacristy by wooden stairs, the east gable of this room has a single lancet window. The chamber was for the use of the sacristan or his deputy. The chapter house is a fine apartment retaining the foundations of the Prior's seat and of the benches round the walls. It opened to the cloister through a vestibule, on either side of which was, northward, a parlour, and southward the calefactory. Both these rooms have remains of fireplaces, also another at right angles to the latter, which was probably the scriptorium, has the remains of the fire opening and a large aumbry or locker for books. The dormitory extended over the whole length of these buildings, and the bottom steps of the staircase leading from it to the cloister are *in situ*. The number of friars at Hulne is not stated, so far as we have been able to discover, but by taking the dimensions of the dormitory, by subdivision we find there was space for seven cubicles or cells, ranged along the cloister side, with a passage width of 4 ft. on the eastern side to the staircase. The sub-prior having his cell at the end over the room we call the scriptorium. The guest house and chapel are fairly entire and are now used as a dwelling-house; they stand detached at the south. Remains of other buildings which may, perhaps, be identified as the kitchen, the infirmary, the brew-house, &c., now used as stores, and sheds are attached to the enclosing or curtain-wall. This wall is intact in the whole of its circuit, it was embattled and had semicircular projecting turrets at the angles, parts of which remain together with some portions of the parapets. The stone steps up to the "alure," or walk behind the parapets exist, in several places, and the original entrance gateway tower is also nearly perfect.

The architecture of the church and buildings is plain and simple in character, without ornament of any kind, the whole forming a most interesting example of a fortified monastic establishment. There is a massive square tower at the west end of the church, but detached from it, which was erected as a refuge in times of danger in 1488, which was seemingly connected with the prior's lodging, whose chambers extended along the west side of the cloister over an undercroft devoted to the use of the cellarer, whose hall was probably situated on the site of the present dwelling-house. Resuming the carriages, the party proceeded to Alnwick to view the remains of the Praemonstratensian Abbey, which were excavated some years ago under the supervision of Mr. St. John Hope, F.S.A. By some misdirection, however, only a few members reached the spot where Mr. Charles Lynam, F.S.A., was awaiting them. He had prepared a ground plan of the whole of the buildings, and explained them to those present. Nothing above ground remains but the Abbey gatehouse, but the foundations of the church and all the buildings have been recovered

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and are marked out in the grass in asphalte. The party then proceeded to Alnwick to luncheon by the invitation of the Duke of Northumberland, the patron of the Congress—and afterwards viewed the celebrated castle which was described by Mr. Cadwallader J. Bates. Alnwick Castle, owing to the extreme irregularity of its plan, with open keep and clustered towers, is exceedingly picturesque, and although it was almost entirely rebuilt under Mr. Salvin's direction, the rebuilding was carried out with the most conservative care and judgment. All that admitted of preservation of the old work was scrupulously retained. The site of Alnwick Castle from its commanding position would seem likely to have been occupied as a stronghold from the earliest times, but it was the Norman baron, Eustace de Vesci, who built the first masonry castle on this site in the first half of the twelfth century. The Barons de Vesci became extinct by the death of the seventh Baron in 1297 when the castle and barony became the property of Antony Bec, Bishop of Durham, of warlike fame. He sold them to Henry de Percy, the first of that renowned family to occupy Alnwick, and he laid out the castle on its present lines. Although the plan is Norman most of the remaining work belongs to the fourteenth and nineteenth centuries. A complete account of this castle as it now appears was published in the *Builder* in 1869 after its restoration by Mr. Salvin. Leaving Alnwick in a thunderstorm the archæologists drove on to Warkworth, but owing to the storm and the shortness of time the castle could only hastily be viewed, and the Hermitage, the Bridge Tower, and church were obliged to be abandoned. Mr. Bates conducted the party over the remains of the magnificent castle. The precincts of the castle were entered by a postern door in the west curtain wall, and as the visitors entered the quadrangle they were astonished by the vastness of the ruins and the richness of the architecture; for this castle, although it has stood many a siege and successfully resisted all attacks, does not present the appearance of a rugged and stern fortress, but rather of a palace-home of luxury and hospitality. Like Alnwick, the site must always have been occupied as a defensive position, but the first stone castle was built early in the twelfth century. In 1173 William the Lion, of Scotland, destroyed the castle, which was not strong enough to offer much resistance. Robert Fitz-Roger rebuilt the castle upon the general plan as now remaining, and obtained from King John a confirmation of the grant of the castle and manor made to his father. King John was himself at Warkworth in 1213. In 1327 the Scots attacked Warkworth but were badly beaten, and later in the same year Robert Bruce laid siege to the castle, but the garrison were able successfully to repulse him. Edward III. granted the castle and dependencies to the second Lord Percy of Alnwick. The earliest recorded instance of the use of cannon in warfare is connected with this castle, for in July, 1405, Henry IV., after reducing Prudhoe Castle attacked Warkworth, the owner, the Earl of Northumberland, having joined in Archbishop Scrope's conspiracy, and in person directed the operations of his siege train, and the royal cannon, or bombards, caused so much damage to the walls that after the seventh discharge the defenders surrendered at discretion. Leaving Warkworth with reluctance, the party returned to Newcastle by train, and in the evening attended a meeting in the committee-room of the Literary and Philosophical Society, kindly placed at their disposal, for the reading of papers. Mr. Thomas Blashill, V.P., presided, and the first paper was read by the Rev. Cæsar Caine on "The Archiepiscopal Mint at York." Mr. Caine exhibited a great many impressions and facsimiles of the coins dealt with in his paper, and traced the coinage from the earliest records down to the period in which reference was made to the coinage of the see in the indictment against Cardinal Wolsey. The title "Peter Pence" was Saxon, and had no reference to the tribute paid to the Pope, but only to the coins issued by the Mint at York, St. Peter being patron of the Church of York. An impression of the coinage of Archbishop John Kemp, 1426 to 1450, was exhibited, but, Mr. Caine said, there is no coin of that Prelate in the British Musuem.

An interesting paper was also read by the Rev. F. S. Colman, M.A., on some little-known "Earthworks at Barwick-in-Elmet, Yorks," which were admirably illustrated by large diagrams and by hand-sheets distributed amongst the company.

Saturday, July 20.

The members of Congress left Newcastle about 9.30 by train for Jarrow and Monkwearmouth. At Jarrow they were met by the Rev. Canon C. H. Savage, who explained the special features of the church and monastery in a most sympathetic spirit. Bede, the Venerable, is the chief glory of Jarrow. There he, the earliest English scholar, passed the whole of his industrious and useful life; there he died, and was buried on the north side of the church in 745. Canon Savage, in describing the ancient Saxon church, which now forms the chancel of the parish church, said that like all early Saxon religious settlements the church and buildings at Jarrow were protected by water, at least on three sides, but the river Don, up which the Danes are said to have sailed, had now degenerated into little better than a sewer—the mud and sludge being deep and extensive. The remains of a Scandinavian ship had been discovered buried some 10 ft. beneath the present surface. The church and monastery were commenced in 683, and were for ten priests and twelve laymen. The dedication stone is carefully preserved and bears the actual date upon it, 684. This and the numerous remains of Saxon work in baluster shafts, &c., preserved in glass cases in the porch of the church, were examined with much interest. In looking at these, undoubted relics as they are of early Saxon days, one was struck not only with the elaborate and delicately worked decoration of these shafts, but by the absence of capitals and bases formed on Roman models such as are found imitated elsewhere in Saxon works. The tower is of unusual form, measuring 20 ft. from north to south, by 13 ft. from east to west, and has an opening high up in the east wall looking into the church, which seems evidence of there having been an upper chamber. At the east end the wall shows traces of an opening to a square presbytery, the position of which is now occupied by a vault. The foundations of the original west end were discovered some years back against the tower wall. The church was burned in 1049. Several of the ancient Saxon windows remain in the south wall. An interesting item in the comparative value of money is a window which was inserted in the south wall of the chancel close to the tower in 1350, which is recorded to have cost 23*s.* 10*d.*; the same window if executed now is estimated to cost 49*l.* 10*s.* Some parts of the monastic buildings still remain of early date, and it is said that vast numbers of scholars attended here for instruction from all parts—over 700 at one time. In the choir stalls and bench ends there is some elaborate carving of flamboyant character; it is thought to have been brought from the shrine of Jesus altar at Durham. The emblem of Prior Castell, a heart pierced by a sword, is to be seen on one of the bench ends. Leaving Jarrow the party proceeded to Tyne Dock Station for train to Monkwearmouth, and at the church were met by the vicar, the Rev. D. S. Boutflower, M.A., who gave a description of the building and its history. The foundation of the Abbey of Wearmouth is somewhat earlier than that of Jarrow. Benedict Biscop founded a monastery at Wearmouth in 675 in honour of St. Peter. The King of Northumbria, Ecgfrith, gave him a site, and helped him in the work, according to the evidence of the Venerable Bede. Bede also goes on to say that Benedict went over to France for stonemasons, who could build him a church of stone after the manner of the Romans, which he greatly admired. He also sent to Gaul for the workers in glass to fill the windows of the church, the porches, and the upper chambers; and from these workmen the English learned the art of glassmaking. He seems to have made several journeys to France and Rome for fittings, sacred vessels, vestments, and decorations, although such as he could get he procured in England. It appears to be generally recognised nowadays that the west porch and west wall of this church are really the work of Benedict Biscop's masons, but the upper parts of the tower are considered to be of later Saxon date, between 807 and 1070. We refer the inquirer to the second paper on "Pre-Conquest Architecture in England," by Professor Baldwin Brown, published in the *Builder* in October, 1895. After lunching at Sunderland the train was taken for South Shields, where some time was given to the inspection of the Roman remains in the Free Library and Museum previously to departing by the ferry from the pier for Tynemouth. During the visit to Tynemouth Priory the "tripper" element was excluded from the ruins by the consideration of the Major-Commandant of the castle and the Members of Congress were enabled to listen to the account given of the Priory by Mr. H. A. Adamson in comfort, and to Mr. Charles Lynam's description of the architectural features without interruption, which was much appreciated. Mr. Adamson said the history of the monastery is an eventful one and carries us back to the time when Edwin, the first Christian king of Northumbria, was converted to Christianity through the efforts of Paulinus, the Roman missionary. Edwin was married to a Christian princess, Ethelburga, daughter of Eadbald, King of Kent, and was baptised on Easter eve in 627, at York. The first church at Tynemouth is stated to have been built of wood by Edwin in 626, but as he was not baptised until the following year, it is likely the church would not be erected until after his baptism. In 634, Oswald ascended the throne on the death of Edwin and between that date and 647, when he was slain, he built a church of stone at Tynemouth. Oswin succeeded Oswald and was murdered in 651 at Gilling, near Richmond, in Yorkshire. His body was brought to Tynemouth and buried in the oratory of the Virgin Mary, and it is from this king and martyr that Tynemouth obtained its great reputation as a place of pilgrimage. The monastery from its foundation until Norman times had an independent existence and was not subject, as it became in later years, to any other religious house. The monastery suffered greatly at the hands of the Viking hordes who constantly made descents upon the coast of Northumbria. It was plundered by them in 788, 794, and in 800. In 865 the church and all the monastic buildings were destroyed by fire in an incursion by the Danes, and the nuns of St. Hilda at Hartlepool who had taken refuge in the church were all massacred. In the year 1065 the relics of St. Oswin were discovered, and in consequence Earl Tosti, King Harold's brother, commenced rebuilding the monastery. The independent life of the monastery came to an end in 1075, when the church was given, together with the body of St. Oswin, to the prior and brethren of Jarrow, and the relics were removed there, but were afterwards brought back and placed in the shrine. Robert de Mowbray, who had come over with the Conqueror, was created Earl of Northumberland, and he completed the church commenced by Tosti. The church consisted of nave, transepts, and choir, terminated by an apse, the foundation of which was uncovered a few years back. The beautiful Transitional or Early English choir, built between 1190 and 1200, is the crowning glory of Tynemouth. The east end and part of the south wall are the principal portions remaining. Malcolm Canmore, King of Scotland, and his eldest son, Edward, were slain in an expedition to attack Alnwick in 1093, and were buried at Tynemouth, and tradition asserts that the body of the king still lies there in some unknown spot.

Tynemouth Priory is illustrated in an article in the *Builder* series of Abbeys published in 1895. At the conclusion of Mr. Horatio Adamson's historical sketch of the priory, the party was conducted round the ruins by Mr. Chas. Lynam, F.S.A., who pointed out all the chief architectural features. At the evening meeting the Rev. H. J. Dukinfield Astley, M.A., the hon. editorial secretary, read a valuable paper entitled "The Resemblance between the Religious and Magical Ideas of Modern Savage Peoples and those of the Prehistoric Non-Celtic Races of Europe," in which he attempted to show from recent discoveries of prehistoric remains in Scotland that in Neolithic times the inhabitants of that country, and probably of the whole of these islands, were in a state of spiritual and mental development similar to that of the present day Australian aborigines. Referring to the rock drawings, implements, weapons, and armlets discovered at Dumbuie on the Clyde, he said they exactly resembled similar rock drawings found in South America, whilst the other relics had been compared with similar ones found later in Australia; he contended, therefore, that those found in Scotland were genuine, and belonged to the Neolithic stage of Scottish history. Mr. Andrew Oliver gave an account of "Flemish Brasses in England" with special

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reference to the brass at All Saints', Newcastle, which covered the altar tomb of Roger Thornton and his wife, dated 1429.

Monday, July 22.

After the Sunday's rest and attendance at the Cathedral service, the members of Congress were prepared for a long day's work, and set forth by train for Bardon Mill, whence carriages were taken for a drive along the line of the Roman wall, under the guidance of Mr. J. P. Gibson, of Hexham, and Mr. R. H. Forster, of London. Journeying northwards, in ascending Barcum Hill, a distant view of Willemotswyk Castle was obtained. It is an old Border keep, and was the birthplace of Bishop Ridley. Vindolana, the ninth station from the eastern end of the wall, was pointed out; and near to its north-east corner, on the line of the Stanegate, a Roman road, is a Roman milestone, still standing in its original position. A halt was made on General Wade's road, and the majority of the party followed Mr. Gibson over the moorland to Borcovicus, the next camp to the eastward of Vindolana. The turf and long grass were very wet after the thunderstorm of the previous night and the rain then falling, but, taking their stand upon the Roman stones, the members listened to Mr. Gibson's description. He said all these moorlands were covered with Roman camps, called summer camps; there were thousands of them —some only 30 ft. or 40 ft. square, but near the wall they had to be larger. It was curious to notice the difference between the earlier and later work of the several occupations. When the Romans returned after being beaten back by the Caledonians they at once built upon the sites of their old camps, they smoothed down, as it were, the surfaces and built anew, and in some places there are three different levels, and it is by difference in workmanship that we know many years must have elapsed between the occupations. The masonry and mortar differ, the oldest being the best; in the early mortar there is no brick, the later mortar and materials evince "jerry" building and are much inferior. The gateway at Borcovicus is of the early type, with two outer and two inner portals, and on each side a guard chamber; each face of the camp had four towers, the remains of which are clearly discernible. This camp was garrisoned by Tungrians. In the praetorium at Borcovicus were found over 1,100 iron arrow heads, some with pieces of wood still adhering to them, and amongst the bases of the columns which once adorned the praetorium was one that had been turned upon a lathe. The pivot holes for the gates and the stop stone in the middle, against which they shut, together with the bolt holes, are still quite perfect, and on the stone threshold may still be seen the ruts made by the wheels of chariots and ox carts. On the left of the road leading up to the camp stood temples to Jupiter and Mars, and a little beyond them, to the eastward, was pointed out an underground chamber, in which were found many altars and inscribed stones dedicated to Mithras, the Persian sun god.

The external walls and the four gateways of this camp are still standing from five to six feet in height. During 1898 the praetorium was thoroughly excavated, and sufficient of the camp cleared out to enable a complete plan of it to be made. Returning to the carriages, the party proceeded eastwards along General Wade's road, noticing the murus on the left climbing the summits of a range of basaltic hills, while the vallum takes an easier route along their southern slopes. Procolitia was next reached, a camp which was garrisoned by the first Batavian cohort. Just outside its western rampart is the site of the votive well, dedicated to the goddess Coventina, which, when cleared out in 1878, yielded over 20,000 coins, twenty-six votive altars, and many other interesting objects. At Limestone Bank a halt was made in order to inspect the ditches of the vallum and murus, which are cut through the solid trap rock for a considerable distance. In going down the Bank a long piece of the wall was seen about 5 ft. high on the left of the road, and upon it the remains of a wall turret. Cilurnum, the sixth camp from the east end of the wall, was inspected. This camp had six gateways instead of four, as was usual, in order that the ala of Spanish cavalry stationed there might be able to issue out on the flanks with rapidity. The wall comes up to the west gateway. Both here and at Borcovicus the remains are very complete, and the streets and lodgings of the garrison can be readily traced, the streets are very narrow and the buildings small. After inspecting this camp the visitors walked to the remains of the Roman villa between it and the river, the North Tyne, and saw the situation of the Roman bridge and the remains of the abutment in the river bed. The bridge was defended by a tower upon the further side of the river. The villa was probably the residence of the officer commanding the station and, like all others on the wall, was constructed with a view to security. No tessellated pavements or wall decorations are found in them, and but few indications of luxury. Strength and hardihood are their main characteristics. Beneath the walls of this villa were discovered the evidences of the tragedy which marked its destruction, for, only slightly covered with earth, were found the skeletons of thirty adults, several children, a horse, and a dog. They had all doubtless perished in one massacre in the last incursion of the Caledonians which destroyed the station. The site of the cemetery was pointed out some little distance away along the river bank, where many Roman memorial stones, some with very touching epitaphs, have been unearthed. After a long and particularly interesting excursion the party drove into Hexham to dinner, as Newcastle could not be reached until very late and there could be no evening meeting.

Tuesday, July 23.

To-day the archæologists made a pilgrimage to Lindisfarne, proceeding from Newcastle to Beal by train, thence driving across the long stretch of wet sand, which can only be crossed at certain hours owing to the tide, in one-horse carts. On arrival at Holy Island, the party at once proceeded to the remains of the famous Priory, where the Rev. H. J. Dukinfield Astley, M.A., the hon. editorial secretary, read a paper upon the early history of the island. The history of Lindisfarne, he said, commenced with the year 635 A.D., and its associations were wholly religious and ecclesiastical. When St. Aidan, on the invitation of Oswald, King of Northumbria, left his other island home, Iona, he chose this spot for the centre of his mission work amongst the heathen Angles of the Northumbrian Kingdom. When he came to Lindisfarne, he came to a country in which the seeds of Christian teaching had already been planted but had been almost uprooted by a fierce outburst of heathen resentment. Oswald, on ascending the throne, was desirous of reintroducing Christianity, and turned for aid, not to the Roman mission, but to the Celtic branch of the Catholic Church, and applied to the Irish Mission of St. Columba at Iona. The first brother sent was quickly disgusted with the rude manners of the half-heathen Northumbrians and returned. Then St. Aidan set forth and went to Oswald at his fortress city of Bamborough. Oswald gave himself with whole-hearted zeal and devotion to the work of helping Aidan; he accompanied him on his journey and interpreted for him. They were both beautiful characters, and it was an ill day for Northumbria when Oswald was slain in battle against Penda, the heathen King of Mercia, in 642. Of Aidan's buildings on Lindisfarne there are no records whatever; they were all destroyed by the Danes in 875. Fifteen successors in unbroken line sat on the throne of Lindisfarne, but St. Cuthbert was the greatest of the Bishops. He died in his lonely retreat on Farne Island after holding the See for only two years, but those two years were sufficient to establish his undying hold upon the sturdy hearts of Northern England. No other of the Bishops of Lindisfarne were renowned like Aidan and Cuthbert; the monastery produced no writer like Bede, but the monks continued to live the saintly life and to act as teachers to all the surrounding districts until the terrible scourge of the all-devouring Northmen came, and attacks which for nearly 200 years were to vex the coasts of Britain commenced with the sack of Lindisfarne, and, the year following, of Jarrow. The island recovered from this disaster, but the Vikings waxed bolder and bolder until, in 868, came the great incursion which wiped out for ever the Lindisfarne of Aidan and Cuthbert, and left the island desolate for 200 years. After luncheon the party again assembled in the ruins of the grand old Priory, and listened to Mr. Astley's description of the buildings. He went on to say that the structure was Norman, and was modelled on Durham Cathedral. It was a Benedictine Priory of the latter half of the eleventh and early part of the twelfth centuries, and showed exactly what a Benedictine church of the twelfth century was, as it retained its original character more than any other Benedictine church known. In 1082 a cell of Benedictine monks set out from Durham to possess themselves of the mother cell at Lindisfarne. For ten years they nursed their strength and then, in 1093, they commenced on the very spot where the charred remains, grass grown and almost indistinguishable, of the former structure stood, to rear the perfect building now in ruins. It was completed, dedicated, and opened about 1120. The monastic buildings were on the south side and can easily be traced, also the bath, the threshing floor, and the school with its stone benches round the wall. A stone coffin was found embedded in the thickness of the wall against the great oven, and in close contact with a couple of drains. Whoever was interred in such a position had evidently sinned grievously against the rules of the order, and was buried with the utmost indignity. Owing to the uncertainty of the hour of return to Newcastle there was no evening meeting.

Wednesday, July 24.

To-day was devoted by the Congress to a visit to Durham, which was reached about 10 a.m. Proceeding to the Cathedral, the party was met by the Dean, the very Rev. Dr. Kitchin, who conducted the members first round the exterior of the edifice, where, on a plinth stone on the east end of the Chapel of the Nine Altars was pointed out the name of the master mason, Thomas Moses, in 1230. The crypt under the Priors Chapel and the great kitchen, date 1380, were visited, the Dean mentioning that food for sometimes 300 persons had to be provided in one day. The present drawing-room of the deanery was the Prior's solarium. In what was the Prior's refectory there is a great deal of fine carved wood panelling of the date of 1502. Passing through the several rooms of the deanery forming parts of the old Prior's lodgings, the party were conducted to the library of the dean and chapter, formerly the dormitory of the monks, where Dr. Kitchin drew attention to a valuable possession of the library, a Bede Roll, beautifully illuminated, 19 ft. in length, for prayers for the souls of Prior Ebchester, who died in 1456, and Prior Burnaby, who died in 1468. The relics of St. Cuthbert found in his tomb are preserved here, consisting of his pectoral cross, a beautiful piece of Anglo-Saxon enamel work, his portable altar, and the embroidered maniple and stole given to him by King Athelstan in 934, also his comb and other relics. Dr. Kitchin then read a valuable paper upon "The History of the Cathedral Statutes," which are unique and date from 1556. After luncheon the Dean again accompanied the party to the Cathedral and pointed out the chief objects of interest internally, and gave an historical sketch of St. Cuthbert, &c., &c. A visit was afterwards paid to the Castle, formerly the chief residence of the Prince-Bishops of Durham, but now the University. At the concluding meeting in the evening a paper by the Rev. C. H. Evelyn White, F.S.A., upon the "Galilee as a place of Sanctuary," was read by Mr. Astley, and one on "Canterbury's Ancient Coinage," by Mr. S. W. Kershaw, M.A., F.S.A., was read by Mr. Patrick.

Thursday, July 25.

The Congress proper closed last night with the usual votes of thanks to authorities and others, but two extra days are included in the programme, the excursion to-day being to Flodden Field, under the guidance of the President, Dr. Hodgkin, F.S.A., who has made the battle and its site a subject of special study. The weather, unfortunately, was not propitious, continuous rain preventing walking over the field to the various positions of the contending armies, as was intended. The distance from Newcastle is considerable, and it was nearly one o'clock before the party arrived at Coldstream and took carriages for the drive. The weather being wet, the President gave a general outline of the positions of the respective forces and the several aspects of the battle, aided by a large scale map of the locality at the inn at Coldstream, before departing for Flodden, his description being full of interest. Flodden was the last great border battle between England and Scotland, and is memorable, not so much for the numbers slain, as for the high rank of many of the victims, including the Scottish king. The

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President, at intervals during the drive, stopped the carriages and pointed out the chief places of interest. Ford and Etal Castles, both connected with the history of Flodden, were also visited; at the latter Sir James and Lady Laing kindly refreshed the party with tea and other comforts. Afterwards the drive was continued to the quaint old Border town of Berwick-on-Tweed, which still retains a great portion of its ancient walls, whence train was taken for Newcastle.

Friday, July 26.

This, the last day of the meeting, was occupied by a visit to Hexham and the locality. The morning was given to the grand old Abbey Church under Mr. Gibson's guidance. There is no lack of books and descriptions of this grand church, and the *Builder* has included it in its "Abbey Series," published in April, 1899, so we need say but little about it. Mr. Gibson described the building. He said also that it was a sanctuary in Saxon times. One mile round the church was the boundary within which any criminal was safe. There were four crosses, one erected at each boundary. In digging a grave in the churchyard in 1827 a little metal vessel was found containing over 9,000 Saxon coins, called "styca" coined only in Northumbria. Austin Canons were established at Hexham in the twelfth century. In 1159 lead mines were being worked. In the "Black Book of Hexham" are preserved many curious customs, and from it we get an explanation of the use of candles at excommunication; at a certain part of the ceremony they were lit and trodden under foot. The Saxon crypt was carefully inspected, and, as many wax tapers and candles were provided by Mr. Gibson, the Roman materials of which it is exclusively built were examined with the greatest interest and ease. On the roof of the north passage is a Roman inscription, partly broken, but showing the absence of the name Geta, being one of those cases in which the name of Publius Septimius, Geta was erased after his murder by his brother Caracalla. In the chancel is preserved the ancient Saxon "Frith Stool," or Chair of Sanctuary, with strap work ornamentation and the knot of the Trinity, about the year 670 in date. One of the most interesting possessions of the abbey is the fine oak rood screen, the only wooden solid screen said to be remaining in any monastic church in England. The remains of the cloisters and monastic buildings were inspected, also the Moot Hall and the Norman keep. After luncheon the majority of the party accompanied Mr. Gibson on a drive to Ayton Castle, and Corbridge, where they inspected the Vicar's Pele, and to Dilston, and returned to Newcastle about seven o'clock. The Congress was generally agreed to have been one of the most successful and enjoyable, as well as instructive, which the Association has held.

CONGRESS OF THE ROYAL INSTITUTE OF PUBLIC HEALTH.

MANY hundreds of delegates from Municipal Corporations, County, Borough and District Councils, and learned and professional bodies throughout the United Kingdom, assembled at Eastbourne on Thursday, the 25th ult., on the invitation of the President (Professor W. R. Smith) and the Council of the Royal Institute of Public Health. The Duke of Devonshire gave the presidential address.

On Friday morning the first of the sectional sittings of the Congress was held. The sections were four in number, namely—A, Preventive Medicine and Vital Statistics; B, Municipal Engineering and Surveying; C, Bacteriology and Chemistry; and D, Municipal and Parliamentary Hygiene. The sections having been constituted, the sectional discussions commenced.

In Section D, over which Sir T. D. Pite presided, several papers of interest were read. The President of the section, in his inaugural address, laid great stress upon the duty of public authorities to provide sanitary dwellings for the very poor. The rent to be paid by the very poor should not exceed from 1s. to 2s. per week, and with such rents there must either be a deficit to be met by local taxation, or the repayment of loans for sites and buildings must be greatly extended—say, to 100 years.

In a paper read subsequently by Mr. Rowland Plumbe, F.R.I.B.A., the subject of the "Housing of the Working Classes" was further developed. He showed plans of and described three well-known classes of workmen's dwellings, namely, suburban cottages, block dwellings divided into self-contained flats, and associated block dwellings having offices in common. We print Mr. Plumbe's paper on another page.

The discussion was opened by Dr. Berry (Wigan). He said it was impossible to devise a scheme that would fit all districts. Each locality required its own scheme. They could not in Wigan do what could be done in Liverpool or Manchester. In Wigan they tried first to build under Part I. of the Act, but found people could not pay the rents they were compelled to charge. Lancashire poor people could not pay 5s. and 6s. a week. Some progress was subsequently made under Part II. They had come to the conclusion that rents must be supplemented by an allowance from Poor Law Guardians (or some other source) of 2s. or 3s. per week.

Councillor Godbold (West Ham), said working men in West Ham were asked to pay 9s. 6d. per week for four small rooms and a scullery, but they had many people in that locality who could not pay more than 2s. 6d. a week for rent. If in Liverpool they were able to let houses at 1s. per room, why not in London?

Alderman Huddart (Salford) said a great deal had been done by Salford in a quiet way to get rid of insanitary dwellings by adopting drastic measures with the owners of slum property. In one scheme they had replaced 6,000 insanitary houses by 1,200 sanitary ones. They found in the Greengate district, where some years ago death rates of 100 and 102 per 1,000 prevailed, a fairly low average rate. If it reached 32 per 1,000 they marvelled, but a short time ago it stood at 13 per 1,000. They never paid a penny of compensation to the owners of slum property. These men were the greatest opponents to improvement. They got a better rent for their slum houses than was paid in the best districts.

Councillor Mallinson (Edinburgh) said they had tried the experiment of closing slum property in the central parts of the city, but they found that the people displaced did not occupy the new houses, because they were too costly. They had now got powers to try another scheme, in which they could get rid by a summary process of slum owners, and build rapidly with a view of getting the people dispossessed quickly back to their old localities. Owners had to show cause why their property should not be closed. They were given a little time to reconstruct, and if that were not promptly done the Authority took the property without giving any compensation, and proceeded to reconstruct it. They could do all that within three or four months, and so rapidly that the people had not time to get into other localities to form other slums. They had obtained power to spread the repayment of loans over fifty years.

Alderman Purcell (Liverpool) said Liverpool had had considerable experience in this matter. They got an Act which enabled them to proceed in a summary manner. The Housing Committee felt determined to house only the people that had been unhoused and those earning casual wages of from 8s. 6d. to 15s. and 1*l.* per week. Instead of 1s. per room, they now built at from 1s. 2d. to 1s. 4d. per room. In some cases they could provide three rooms for 3s. 6d. per week, and in others for 4s. 6d. The Committee would not cater for the better class of artisans, but would rather keep the dwellings empty until persons who had been dispossessed applied for them. The Council proposed to spend 1,250,000*l.* on rehousing schemes and to provide for 7,000 persons. The plan adopted was to provide dwellings for those to be dispossessed before the old homes of the people were demolished.

In closing the discussion, Sir T. D. Pite said the Corporation of Dublin had an insanitary area of 300 houses to deal with, and they felt that if these were closed they would but drive the people to other slums. They had in some single rooms four, five, and six persons, and in one of such rooms there had been a great row because one of the six occupants wanted to take in a lodger. The Local Government Board had refused to give them (in Dublin) any extension of time for the repayment of loans; but if Edinburgh had got such an extension, Dublin would not be long in asking for it.

Mr. Rowland Plumbe, in replying, said his paper was on the housing of the working classes, not on the housing of the very poor. The mechanic was not a poor man. From what had been said that day it was clear that there was hope for the very poor, and they would see what they could do for them in London.

Sir C. A. Cookson read a paper entitled "A Smokeless London" in his position as delegate of the "Coal Smoke Abatement Society," which the lecturer said was started in 1898 by the enthusiasm and energy of Sir Wm. Richmond, R.A. The object of the paper was to show that the remedy for the smoke evil which afflicted London was less desperate than it had been deemed. The Chairman of the London County Council had stated that it was now "an exceptional thing to find a shaft creating a nuisance for any length of time." That picture might be a little premature, but the time was not far distant when Local Authorities would act promptly on the reports of their inspectors, and offenders against the law would be given no rest. Legislation, if its enactments were properly administered, seemed sufficient to cope with manufacturers' smoke, but it did not touch the nuisance so far as it was due to domestic fires, which formed the most difficult part of the problem. Two conditions must be fulfilled by any proposed solution, (*a*) it must be applicable to any open grate, (*b*) it must not increase the cost of the domestic fire. They were thus thrown back on the use, in some form, of smokeless fuel, the chief practical objection to which was the greater difficulty of ignition. This difficulty could be overcome in either of two ways, (*a*) by laying the foundation of the fire in a bed of ordinary coal, kindled as usual by wood, or (*b*) by placing a perforated pipe lit by a Bunsen gas burner underneath the grate, and connected with the gas service of the house.

The second alternative was that recommended in the paper. Coke and anthracite were smokeless fuels. If the supply of the latter could not be indefinitely increased, there would be no difficulty in multiplying our supplies of coke. It was possible, but not probable, that some increase in the price of fuel might result; but what would that be when set against the gain from the abolition of the smoke nuisance? The gain in money alone would be enormous. It had been calculated that the loss from injury done by London's smoke to external paint and internal decorations, to hangings, carpets, and clothes, together with the cost of extra washing and cleaning, was not less than 3,000,000*l.* a year—a sum nearly equal to the cost of half the coal used there for domestic purposes. Add to this the defilement of atmosphere which affects the health, happiness, and morals of the greatest city in the world, and the destruction of the beauty of its buildings, works of art, parks, and gardens, and who would hesitate to pay for all these evils even, if that should prove necessary, by the introduction of a law, which, once it had been shown that the creation of smoke nuisance from the domestic hearth was as preventible as that from the trade furnace, would render both equally liable to legal control?

Messrs. B. Hodgetts, Kidson, Gordon, Sir C. Cameron, and Alderman Huddart took part in the discussion, and Sir C. A. Cookson replied.

The section subsequently adjourned until Monday, as did all the other sections, in order to give opportunity to the members to attend the address given in the afternoon by Professor Koch, of Berlin, on "Malaria;" to attend the garden party given by the Duke and Duchess of Devonshire, and the excursions arranged for Saturday to Battle, to Normanhurst, to Arundel Castle, and to the Isle of Wight.

The section resumed the discussion on housing on Monday upon the reading of a paper by Bailie Steele, of Glasgow, showing what had been done in Glasgow in connexion with improved and healthy dwellings for the working classes; the discussion on the paper being followed immediately by another opened by Dr. H. Mansfield Robinson (Shoreditch) as to the question of extending the period for the repayment of debt for erecting model dwellings.

In opening the discussion on Bailie Steele's paper, Dr. Mansfield Robinson said the "family home" described in it was its most interesting feature, and the numerous questions put by the Doctor, Town Clerk of Shoreditch, and by Mr. Alderman Purcell (Liverpool), the Mayor of Southend, Councillor

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Morris (Liverpool), Mr. Alderman Huddart (Salford), the President of the section, and many others who took part in the discussion, proved that the whole section coincided with this opinion.

Dr. Mansfield Robinson subsequently opened a discussion on the question of the period for the prepayment of loans for erecting dwellings for the poor.

A series of resolutions submitted by Dr. Mansfield Robinson for the purpose of remedying the evils were discussed, and after some verbal amendments were unanimously adopted by the section. The first resolution embodied an emphatic protest against the persistent ignoring by the Local Government Board of the recommendations of London and provincial municipal authorities, passed unanimously at many different conferences, and which the Congress now urgently reiterated. The second resolution declared that the present conditions of repayment inflated the charge for rent beyond the means of the poorer workers and crippled and frustrated the efforts of municipal authorities, and the third appealed to the Government to adopt and pass immediately the Bill now before the House for securing the extension of housing loans to a maximum of 100 years.

At the final general meeting of the Congress, which was held on Tuesday last, these resolutions (with others passed by the sections) were received and adopted, and a promise was made that they would be carefully considered by the Council of the Institute.

THE HOUSING OF THE WORKING CLASSES.*

AT the request of the Institute, I have pleasure in reading a short paper on "The Housing of the Working Classes and the Erection of Modern Dwellings for the same in large Towns."

No similar subject seems to me to have received so much consideration or to have been so much discussed as this; still there are many points which require elucidation.

One point on which much deliberation has taken place is this, viz.:—To what extent should houses for the working classes be provided by the Municipal Authorities, and whether, if such is done, they should provide for the whole of the actual wants of the district, it being held that the action of the municipality practically stops ordinary speculating builders from building this class of property. For instance: In London it is generally thought that the action of the London County Council in building such vast blocks of buildings, has checked that inclination to build working-class dwellings that formerly existed on the part of the speculator, and which, if encouraged, would probably have resulted in a still larger provision of houses of this class.

Of course, it is very difficult to prophesy, but seeing that now the most advanced boroughs in London are following in the footsteps of the London County Council, it seems to me that the housing movement is in good hands and likely to improve.

Probably the most difficult point still remaining to be settled is the housing of the poorer working classes, a large number of whom do not earn more than a pound a week. What proportion of their earnings can they spare for rent? Shall we say 2s., or at most 2s. 6d. per week? Clearly, this will not even pay for a single room, but the problem must not be given up. It is met at present mostly by this class clubbing together and taking single rooms in old houses, so that they are overcrowded and unsanitary in addition to the other many evils that arise.

Glasgow, by its Buildings Regulations Bill, appears to be contemplating the building of single-room dwellings. The experiment will, no doubt, be most interesting. It is possible that one-roomed blocks might be arranged somewhat on the plan of Lord Rowton's buildings, with a common kitchen and single bedrooms in lieu of cubicles, but the difficulties would be great, as all buildings would have to be open all day.

Modern workmen's dwellings as at present built may be divided into three classes (leaving out the single-room blocks):—(*a*) The suburban cottage; (*b*) the block dwelling divided into self-contained flats; (*c*) associated block dwellings having offices in common.

* A paper read by Mr. Rowland Plumbe, F.R.I.B.A., at the Public Health Congress, Eastbourne

Seeing the many manifest advantages that are enjoyed by the tenant living in his own cottage, it is strange that so little has been done in this direction by the many companies and municipal bodies engaged upon this work.

What can be more desirable for the wife and children than to live in pure country air with the use of their own gardens and drying grounds? What more advantageous than for the working man himself to spend his hours of rest, Sundays and weekdays, among the healthy surroundings of his home in the model village in the country? Possibly you ask, where can this be done? In a paper I read at the International Congress of Hygiene and Demography, and published in the "Transactions" of the Sanitary Institute, I fully described a village of this sort which exists, and, moreover, the London County Council are, I believe, about to commence a similar undertaking in the immediate neighbourhood.

On the estate in question a cottage is built on a plot of land 60 ft. by 13 ft. wide, containing a little front garden, a front living-room, kitchen in rear, small washouse outside, and two bedrooms over; there is also a back garden or drying ground. The rental of this house to original tenants is about 6s. per week, but since taxation has gone up it has been necessary to increase the rent to new tenants.

There are on this estate other classes of houses each larger than the other at increased rentals. The houses are built with every precaution and full attention to sanitary construction, and I venture to lay upon the table drawings of these buildings; on the London block scale they would be worth 12s. per week.

I should also like to bring before your notice another cottage scheme, but this is in flats, two stories high and two sets wide, so that there are four sets of rooms, each having living-room and two bedrooms and scullery. These could be let at 7s. 6d. per set. The London block rate would be 9s. 6d. per set.

With regard to suburban cottage dwellings, the great difficulty is one of conveyance, and in order to develop the same it will be necessary to give much greater facility of access than now exists.

The railway companies generally profess that it is impossible to give passengers third-class monthly tickets for local traffic, although the Midland have done so for years. Apart from the granting of workmen's tickets by a few early trains in the morning, a third-class passenger actually pays as much for one suburban journey backwards and forwards a day as the first-class and second passenger season ticket holder who travels as often as he likes, including Sundays. Some great improvement must be made in this system. No doubt the general use of the bicycle does something to facilitate traffic as well as the improved system of tramways. After all that can be said in favour of cottage suburban dwellings, however, there remains a vast population of the working classes who must be housed in fairly close proximity to the work they have to do, hence the urgent necessity of making adequate provision for their accommodation.

This brings us to the consideration of the second part of our subject, namely, the housing in block dwellings.

Undoubtedly the most desirable form of such a building is the self-contained flat, in the planning of which great ingenuity and great variety have been displayed.

I venture to lay on the table plans of dwellings I have erected for the Council of the Borough of Shoreditch in Moira-place and Plumber's-place. The tenements are quite self-contained, and consist of a living-room 167 ft. in area, looking, in every case, on to the street, and fitted with a well-ventilated food cupboard, dresser with pot-board under, a 2-ft. 6-in. self-setting range with open and close fire; a scullery, 9 ft. by 6 ft., approached from the living-room and overlooking the courtyard, fitted with sink and draining-board, with coal bunk for 2 cwts. under same; a six-gallon copper, and a 2-ft. open cottage range, so that the scullery can be used as a kitchen if the tenants so wish. There are no dust shoots, but a galvanised dust-pail is provided for each tenement. These will be put out on the landings by the tenants twice a week, and the refuse removed by the vestry's dust contractors. The bedrooms are approached direct from the living-room, and in the case of the three-room tenements, one bedroom has an area of over 120 ft., and the other over 96 ft.

The two room tenements have a bedroom of an average area of 127 ft. Each bedroom is fitted with a mantel register stove. The height of the rooms is 8 ft. 6 in. throughout. The living and bed room walls are plastered and distempered in fancy tints with a darker dado and separating line. The scullery walls are in Fletton bricks. Each tenement has its own water-closet, disconnected from the rooms by a short lobby. The water-closets are well lit and ventilated and look on to the courtyard.

The tenements are approached direct from the staircases (there being no corridors in the building) two tenements on each floor from a staircase, the entrance to a tenement being through an iron railing and gate into a lobby, having the living-room door on the one side and the lobby leading to the water-closet on the other. The lobby is well-lit and ventilated from the staircase and by a fanlight over the water-closet door. The object of the iron railing is to allow of the water-closet being inspected without going into the rooms of the tenant.

The staircases, approached through an open archway from the courtyards, are of good width, easy, and well lit and ventilated, having a large window to every floor, and an extra casement window which can be left permanently open for ventilation at the highest point. The staircases are finished with a glazed brick dado and Fletton bricks above.

The construction of the buildings is noncombustible throughout, all internal walls being of brick and the floor composed of iron joists embedded in concrete. Staircases and landings of granolithic. The sanitary arrangements have been most carefully studied with due regard to cost. Each scullery and water-closet is fitted with a gully discharging into a rain-water head outside the building, so that both can be sluiced out with water or in case of mishap with the water fittings the tenements would not be flooded. The water-closets are fitted with "Oatley patent overflow soil and anti-syphonage pipe junction," so that should one water-closet become blocked the others will not be put out of action, nor water-closets at a lower level than the one used be flooded. See plan. The rain water and sink wastes discharge into gullies having cleaning caps, so that all short lengths of drain can be cleaned and manholes are placed on the main drains at all bends and junctions. The whole of the water used is stored in Alexander's patent self-cleansing air-tight cisterns, placed in the roof space and easily accessible. The staircases and tenements are lit by electric light, the latter being supplied at a weekly rental. The elevations are carried out with a brown glazed brick plinth for one story and yellow stock brickwork above picked out with red quoins and bands and a small amount of brown Portland stone in the gables. The roofs are constructed on the mansard principle and covered with green slates.

In this class of building, the plan is of necessity the first consideration, but in the external design of the dwellings, the monotonous repetition of small windows has been overcome by the introduction of boldly massed gables of distinctly picturesque outline, obviously influenced by the remains of ancient brickwork to be found in the old towns of East Anglia. The rents charged for tenements are 8s. 6d. for the three-room and 6s. 6d. for the two-room sets, and there are in the buildings, five cupboards which are let to the tenants at 3d. per week. The total annual rental for the three blocks amounts to 1,530*l.* 15s. This rental, taking the total cost of erecting the buildings and the value of the two plots of land at 22,917*l.*, and allowing for all rate, lighting, supervision and collection of rents, empties and losses, insurance and sinking fund to reproduce the total outlay at the termination of sixty years at 2½ per cent., repairs and incidental outgoings, will produce an interest of 3⅗ per cent. on the total outlay.

The question of the tenants purchasing an interest in the dwellings has been reported on by me, taking as I do some considerable interest in the question. I find if tenants will pay an extra shilling per week, they can practically purchase a long leasehold interest in their houses in the space of thirty years. They would, of course, still have to contribute towards the rates and taxes and the keeping up of the premises, but this could all be provided for, the Vestry keeping that in their own hands and also charging for the work done in administer-

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ing the estate. Nothing has yet been done as there are difficulties in the way.

I also submit some varieties of plans carried out for the London Council Council. There are many varieties of arrangements adopted in the planning of these self-contained flats. Sometimes one staircase is made to serve four sets of rooms instead of one, but that, however, mostly entails building the rooms back to back without through ventilation, a scheme which our advanced sanitarians hardly advise.

A not uncommon method of approaching these blocks of flats is by means of a verandah going all round the building with approach staircases at intervals as shown on the plan submitted. It is thought that the projection of this verandah takes light and air away from the rooms below. It also, of course, involves the whole of the traffic passing the windows and doors on all floors, so that less privacy is given to this class of building than is the case with other designs.

There is yet another type of block building to be described, viz.: the Associated Dwellings, a plan of which I venture to lay before you. Here it is seen that central corridors are provided, with as many sets of rooms opening from them as can be obtained. The rooms are provided with a certain number of closets in open lobbies, dust shoots are provided for the dust, sinks for water, and bathrooms all used by the tenants more or less in common.

I doubt whether this method of planning is much more economical than the self-contained system. There is a much larger area of corridor and the blocks of the building are necessarily very much wider. The want of privacy is, I think, dearly paid for by any supposed advantage. There is greater risk of spread of disease, greater risk of annoyance from undesirable and noisy tenants, and a general absence of the quiet and repose which a man gets who enters his own street door from an ordinary staircase and not from corridors held in common.

Another variety of these Associated Dwellings may, I think, be found interesting. In this case the central staircase is more or less well lit by passages to the sinks. Two sinks and a water-closet are provided, a general washouse on each floor, and a bathroom on the ground floor. The staircases lead to four sets of rooms, which are, however, back to back. I think, on the whole, that this shows the most desirable form of Associated Dwellings.

In conclusion, I cannot help referring once more to the question of dwellings for the very poor in London. I fear nothing efficient can be done for them except to build largely dwellings for the thrifty and working classes and by so doing to leave a much greater number of old buildings for the use of the poor who cannot afford the accommodation provided in the buildings just described. It is a very poor alternative, and one which I trust the constant efforts of men who are taking an interest in such work will change for the better.

I have not enlarged upon the financial requirements of these schemes, as I understand that my friend Dr. Robinson will refer more particularly to that branch of the subject. Generally, however, the land which is taken for the purpose of building artisans' dwellings cannot be used at a price which represents more than a rental of from 2d. to 3d. per foot super. Capitalised at twenty-five years' purchase this would be 4s. 2d. and 6s. 3d. per foot for freehold, and where the London County Council and Parochial Authorities build, they are expected to give a net return of 3 per cent., and in addition to provide a sinking fund which will pay off the total cost of the building in sixty years. The sinking fund, of course, puts a heavy burden upon the undertaking, but on the other hand, the investment is a good one for any Corporation, as in sixty years the property reverts to the promoters, who will then enjoy the full income derived.

CHURCH, WATH-UPON-DEARNE, YORKSHIRE.—The foundation-stone has just been laid at Wath-upon-Dearne of a mission church. The new church will be a Gothic building, consisting of nave, chancel, organ recess, vestry, baptistry, and two porches. There will also be a large parish-room at the west end, which can, if the requirements of the district demand, be added permanently to the nave, thereby raising the sitting accommodation from 255 to 340. The building will be faced inside and out with dark red Thurstonland bricks, with dressings of stone and terra-cotta. Mr. E. Isle Hubbard, of Rotherham, is the architect, and Mr. Fuller, of Wath, the contractor.

Illustrations.

STOWELL PARK, GLOUCESTERSHIRE.

THIS work of Mr. Belcher's was to have been visited by the Architectural Association this year during their annual excursion, and it was for this special reason that we inserted an illustration of it under this date, Mr. Belcher having kindly lent the drawing for the purpose. At the last moment, however, the programme was altered and the visit to Stowell Park was abandoned.

Our illustration is from a fine drawing of Professor Pite's, made some years ago while the work was in progress. Stowell Park was an old house from which Lord Stowell, the brother of Lord Chancellor Eldon, took his title. It is finely situated on a hill overlooking Chedworth Woods. Until the present Lord Eldon put it in Mr. Belcher's hands, it was used as a farm. Mr. Belcher disturbed the old place as little as possible, simply linking the buildings together by additions similar in character to the old work; he had the Georgian sashes taken out and the stone mullions replaced. On the left is the Parish Church and the old tithe barn, the latter now intended for use as a billiard or ball room. At the back are new stable buildings, laundry, &c.

INTERIOR, EDGEWORTH MANOR.

THIS is a part of the addition made to this house by Messrs. Ernest George & Yeates a year or two since. The house was visited by the Architectural Association on their excursion this year, and some reference to it in this connexion will be found at the close of our last week's article on the excursion.

The exterior of the new portion of the house was shown in a plate in our issue of May 19, 1900.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

THE two pages of illustrations of places visited by the Architectural Association in the course of their annual excursion, which is reported on another page, are from sketches specially made on the spot by Mr. W. Curtis Green.

The first shows the fine late mediæval town hall, with the church in the rear, the entrance porch to the church being on the ground floor of the Town Hall building. The second sheet shows sketches from various places visited, and which are referred to and described in our article.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Poplar Borough Council 1,500*l.* for the purchase of electric light meters; Southwark Borough Council 700*l.* and Hampstead Council 2,810*l.* for the same purposes; Hampstead Borough Council 19,529*l.* for electric light installation, electric light meters, &c.; Stepney Borough Council 3,000*l.* for the purchase of electric light meters; Chelsea Borough Council 1,200*l.* for works at public library; Greenwich Guardians 68,540*l.* for erection of schools; St. Pancras Guardians 5,200*l.* for the purchase of property; and Chelsea Borough Council 5,800*l.* for paving works.

Tramways.—The Highways Committee recommended, and the recommendation was agreed to, an application for Parliamentary powers to construct new tramways along Victoria Embankment; along Elgin-avenue to Harrow-road; Trafalgar-road, Greenwich; and from Woolwich to Eltham.

Proposed Improvements.—The Improvements Committee recommended the widening of a portion of the Hampstead-road, on condition that the St. Pancras Borough Council should contribute one-eighth of the net cost, and should also consent to a tramway from Hampstead-road terminus, across Euston-road, and along Tottenham Court-road. The Committee also submitted proposals for the widening of High-street, Eltham, and High-street, Fulham, in connexion with the proposed new tramways.

The Finance Committee reported that the total estimated cost of the tramway and street improvement proposals for next year was 2,674,518*l.* It was anticipated that the proportion of the net cost of the street improvements which would fall upon the county rate would be 564,551*l.*

The reports were adopted.

Housing.—The Housing of the Working Classes Committee recommended votes of 15,000*l.* for foundations of blocks of dwellings on the Reid's Brewery site, to accommodate 2,022 persons; 8,745*l.* for dwellings to accommodate 200 persons at Swan-lane, Rotherhithe, in connection with the tunnel rehousing scheme; 17,552*l.* for Sydney and Melbourne buildings, Ann-street, Poplar, to complete accommodation for 630 persons, as against 261 displaced.

In regard to Reid's Brewery site,

Mr. R. Williams called attention to the fact that the Council was gradually decreasing the floor space given in working-class dwellings, and he moved as an amendment "That the recommendation be referred back to the Committee with instructions to so amend the plans for this site that not more than 500 persons to the acre be housed thereon."

Mr. Wightman seconded the amendment.

Mr. Hunter said that if the amendment was carried they could say good-bye to houses for the working classes in London.

Mr. H. Smith said they were bound by the standing orders to make the buildings pay, and if they were to put less people on the land they could not make the scheme pay.

Mr. Waterlow said the whole matter was ruled by the cost of the land. If the land was cheap, they put fewer on the land. In the block of Guinness's dwellings opened last week there were 838 persons to the acre.

The amendment was defeated by a large majority.

The dwellings at the Swan-lane site will consist of twenty two-roomed and twenty three-roomed tenements, and will provide accommodation for 200 persons. The architect's estimate for these dwellings is made up as follows:—Building estimate, 8,145*l.*; architect's expenses, quantity surveyor's and other fees, provision for articles to be purchased direct and for first year's contingencies, 600*l.*

In regard to Sydney and Melbourne Buildings, Ann-street, Poplar, the committee reported as follows:—

On June 18, 1901, the Council authorised us to issue an advertisement for tenders for the erection of Sydney and Melbourne Buildings for the accommodation of 440 persons under the Ann-street scheme, Poplar. In response to the advertisement five tenders were received and referred by the Council to us on July 16, 1901, as follows:—

		With alternative prices.
F. & T. Thorne ...	£14,972 17	..... £15,674 12 4
Martin Wells & Co.	16,196 0	..... 16,693 11 10
B. E. Nightingale...	16,293 0	..... 17,188 3 2
H. L. Holloway ...	16,745 0	..... 17,688 9 6
Marsland & Sons...	17,729 0	..... 18,441 0 0

An informal tender from Messrs. Herbert Brothers, amounting to 14,130*l.* (14,637*l.* 2s. 2d., with alternative prices) was also received. All firms tendering were requested to give an alternative price for which they would be prepared to use red facing bricks and compo mortar, and to comb grain the internal woodwork. On this basis it will be seen that Messrs. Thorne's tender amounts to 15,674*l.* 12s. 4d. as against the Architect's estimate of 16,648*l.* 15s. 6d. . . . . The building of these dwellings will complete the provision of accommodation under the Ann-street scheme for 630 persons as against 261 displaced. This is a result which we cannot but view with satisfaction. We recommend that the working drawings, specification, and bills of quantities, together with the estimate of 17,552*l.* 15s. 6d. submitted by the Finance Committee in respect of Sydney and Melbourne buildings, Ann-street, Poplar, be approved; that the tender of Messrs. F. & T. Thorne for the erection of the building, amounting to 15,674*l.* 12s. 4d., be accepted."

The recommendation of the Committee in each case was agreed to.

Waterlow Park.—The Parks Committee recommended an application to Parliament for compulsory powers to purchase Fairseat House and grounds for the improvement and enlargement of Waterlow Park, at an estimated cost of 9,000*l.* It was suggested that there was no precedent for the compulsory acquisition of property for mere pleasure purposes, but in view of recent decisions of Parliament there was a prospect of a successful issue.

The recommendation was adopted.

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Theatres, &c.—The following applications were agreed to :—

Alterations under back part of stage at the Garrick Theatre (Messrs. Horne & Birkett).

New theatre at the corner of St. Martin's-lane and St. Martin's-court, to seat 1,039 persons (Mr. W. G. R. Sprague for Mr. A. D. Peckham).

Alterations to the dressing-room block at the Oxford Music Hall, Oxford-street (Messrs. Wylson & Long).

List of Streets and Places Within the Administrative County of London.—The Building Act Committee reported as follows :—

"The list of streets and places within the administrative County of London, ordered by the Council to be printed, is now practically completed, and the volume will probably be published during the summer recess. The volume is, as far as possible, a complete index to the names now in use of streets and places within the area of the Council's jurisdiction, and contains the following information :—The names of all streets and places (including a large number of artisans' dwellings, mansions, &c.), their locality, postal district, parish, city or metropolitan borough, county electoral and parliamentary divisions, ordnance sheet number, and, where a street has been renamed or renumbered, the date of the order and the abolished subsidiary names, and other useful information. We have had 2,000 copies of the book printed, and they will be put on sale at the price of 10s. 6d. per copy. . . . ."

District Surveyor for North Battersea.—The same Committee recommended :—

"That consent be given to Mr. H. J. Hansom, the District Surveyor under the London Building Act, 1894, for the District of North Battersea, to appoint as his deputy Mr. R. D. Hansom, of No. 8, Collegegardens, Dulwich, to perform all the duties of such District Surveyor, for a period of six months from July 11, 1901 ; such consent being subject to the condition that Mr. H. J. Hansom shall not during such said period without the previous consent of the Council to be signified in writing under the hand of the Clerk of the Council, act as District Surveyor or revoke the appointment of Mr. R. D. Hansom as such deputy, or in any way interfere with the performance by Mr. R. D. Hansom of his said duties."

It was reported in this connexion that the whole question of the District Surveyors' districts was engaging the constant attention of a sub-committee, and the Building Act Committee hope to be in a position to report fully upon the matter shortly after the summer recess.

The recommendation was agreed to.

Office Accommodation.—It was agreed that an expenditure of £2,010 be incurred for the provision of furniture, fittings, &c., electric lighting, and the re-construction of the drains at Nos. 26 and 27, Cockspur-street, in connexion with the removal to those premises of portions of the Engineer's department.

Heating at Central Offices.—The tender of Mr. Edward Deane, amounting to £139, for additional heating at the central offices, was accepted.

Electric Lighting at Fire Stations.—The Fire Brigade Committee reported as follows, the recommendation being agreed to :—

"An opportunity is afforded of lighting the Manchester-square, Bishopsgate, and Brompton stations by electricity, and by our directions the chief engineer invited several firms to tender for the necessary wiring and fittings. The tenders received are as follows :—

	Manchester-square.	Bishopsgate.	Brompton.
Forrest & Son	£236 10 0	£208 10 0	£122 10 0
Drake & Gorham	243 15 0	220 15 0	128 0 0
Glover & Co.	245 0 0	220 0 0	143 0 0
The Lighting Corporation, Ltd.	256 9 6	233 19 6	147 6 6
C. Esson	259 0 0	215 0 0	125 10 0
Coleby & Co.	295 10 0	273 12 0	165 18 0
Laing, Wharton, & Cunnington	299 16 0	238 12 0	152 10 0
Allam & Co.	312 16 0	274 10 0	164 15 0
J. Sperati	378 0 0	313 0 0	186 0 0
Wells & Co.	470 0 0	410 0 0	230 0 0

. . . . We recommend : "That subject to the result of enquiries to be made by the solicitor proving satisfactory, the tenders of Messrs. G. Forrest & Son to execute for 236*l.* 10s., 208*l.* 10s., and 122*l.* 10s., the wiring and supply the fittings for electric light installations at the Manchester-square, Bishopsgate, and Brompton stations respectively be accepted . . . ."

Paving and Sewer Work. Totterdown-fields Estate. — On the recommendation of the Housing Committee, it was agreed, "That the expenditure of a sum not exceeding 7,725*l.* in respect of the sewer and temporary paving works on section A of the Totterdown-fields estate be sanctioned ; that the chairman of the Housing of the Working Classes Committee be authorised to accept the lowest satisfactory tender within that amount . . . ."

Brickmaking at Norbury.—The same committee recommended, and it was agreed—

(*a*) That the estimate of 4,000*l.* submitted by the Finance Committee for the making of bricks on the Norbury estate during the year 1901-1902, be approved, and that the work of making the bricks by the employment of direct labour be undertaken by the Council.

(*b*) That the Housing of the Working Classes Committee be authorised to appoint a foreman brickmaker under the architect on the Norbury estate, at the wages of 3*l.* 3s. per week, with such bonus as will bring those wages up to 4*l.* 10s. a week, on condition that he turns out suitable bricks at a cost not exceeding 25s. per 1,000, and to take all necessary steps for the purchase of such plant and materials and the payment of such wages as may be required during the brickmaking season of 1901-1902.

Cottages, Totterdown-fields Estate.—The following recommendation by the same Committee was also agreed to :—

"That the working drawings, specification, and bills of quantities in respect of three representative rows comprising cottages of the four classes, and the estimate of 74,093*l.* submitted by the Finance Committee, in respect of the erection of all the cottages to be built on Section A of the Totterdown-fields Estate, Tooting, be approved ; and that the Housing of the Working Classes Committee be authorised to invite tenders for the erection of the three representative rows, the tenders to be subject to the condition that the successful contractor shall undertake the construction of the remaining cottages on section A at the same schedule of prices and upon bills of quantities to be prepared and supplied as the work is required to be carried out."

Widening Piccadilly.—With respect to the proposed widening of Piccadilly between Hyde Park Corner and Walsingham House, as to which a long discussion on the question of saving the trees took place at last week's meeting of the Council, the Improvements Committee informed the Council that a conference had been held with the Secretary of his Majesty's Office of Works, and it was believed it would be possible to save eleven of the existing trees.

Replying to Captain Swinton, Mr. Davies said of fifty-seven trees affected by the improvement, only eight would be actually cut down.

Holborn to the Strand Street—Gaiety Theatre, Gaiety Restaurant, and Messrs. Short's premises.—The Improvements Committee reported as follows, the recommendation being agreed to :—

"The London County Council (Improvements) Act, 1899, authorises the construction of the new street from Holborn to the Strand, and the improvement is now being undertaken. The Act makes provision for the reinstatement of the Gaiety Theatre, Gaiety Restaurant, and Messrs. Short's premises on the western horn of the new crescent site at its junction with the Strand, and we have had before us a design for the elevation of the new buildings. It should here be mentioned that Mr. Runtz, the architect engaged by the owners of the premises in question, submitted to the Council some time ago plans and sections for the interior of the new theatre, and these plans were reported upon by the Theatres Committee and sanctioned by the Council on December 18, 1900. Subsequently Mr. Runtz, who, it will be remembered, was one of the eight architects invited by the Council to prepare sketch designs for the elevations of the buildings to be erected in connexion with the Holborn to the Strand improvement, submitted a design for the elevation of the new Gaiety Theatre, Gaiety Restaurant, and Messrs. Short's premises. Upon receiving this design we decided, upon Mr. Runtz's suggestion, to ask Mr. R. Norman Shaw, R.A., if he would assist us in deciding whether the design was such as the Council could be advised to approve, having regard to the extreme importance of the site upon which the new Gaiety Theatre would be erected, and the probable effect of the new buildings upon the architecture of other buildings to be erected in connexion with the improvement. Mr. Norman Shaw readily placed his services at our disposal and spared no pains in examining into the whole matter. He had several conferences with us upon the subject, and after the fullest consideration we formed the opinion that the particular design was not of such a character as we could advise the Council to approve for the site in question. Subsequently Mr. Runtz had a conference with Mr. Norman Shaw upon the subject with the result that they both attended before us, and Mr. Norman Shaw very kindly made suggestions for the architectural treatment of the buildings in question and produced a sketch design in illustration of his suggestions. Mr. Runtz at once accepted Mr. Norman Shaw's suggestions, and proceeded to prepare a complete design based thereon. We have now received this complete design and a perspective view of the buildings. After full consideration of this design, and having received further advice from Mr. Norman Shaw thereon, we are of opinion that it is such as may well be sanctioned, and we have therefore decided to advise the Council to give its formal approval thereto. We desire to take this opportunity of acknowledging our indebtedness to Mr. Norman Shaw for the very valuable services he has so readily placed at our disposal during our consideration of the important and difficult question of the elevations of the buildings in the improvement in question. We recommend—That, in connexion with the Holborn to the Strand improvement, the approval of the Council be given to the design submitted to the Improvements Committee on July 24, 1901, by Mr. Ernest Runtz, and based upon Mr. Norman Shaw's sketch design, for the elevation of the new Gaiety Theatre, Gaiety Restaurant, and Messrs. Short's premises, proposed to be erected on the western horn of the new crescent site at its junction with the Strand."

The View from Richmond Hill.—The Parks Committee advised the Council to agree to pay 3,500*l.* by way of deposit in order to secure the option until December 31 of acquiring the Marble Hill estate, and thus preserving the view from Richmond Hill, for the sum of 70,000*l.*

The recommendation was adopted without discussion.

A Motor Fire-engine.—The Fire Brigade Committee reported that in the near future it would be expedient to adopt some more rapid method of traction than was afforded by horse-power. They recommended that an expenditure of 400*l.* be sanctioned for the building, in the brigade workshops, of a motor fire-engine ; the necessary parts to be purchased outright, and to be put together under the chief officer's supervision. This was regarded as a more satisfactory and economical arrangement than buying an experimental engine from a firm.

The recommendation was agreed to.

Tenders. — The following recommendations of the Parks Committee were agreed to :—

"That the tender of Messrs. R. Taylor & Sons to supply, at a cost of 225*l.*, a Cornish boiler for use at Battersea Park, be accepted. . . . ."

"That the tender of the Acme Wood Flooring Company, Limited, to supply wood paving in connexion with the formation of new gymnasium at Kennington Park at a cost of 12s. 9d. per square yard, and that of Messrs. Rowland Brothers to supply certain new oak pale fencing and to refix the existing fencing for the sum of 113*l.* be accepted. . . ."

That the offer of Mr. T. Cruwys to supply gymnastic apparatus for the new children's gymnasium in Kennington Park for the sum of 117*l* ; of Messrs. Hill & Smith to provide the necessary fencing around the swings for the sum of 20*l.* ; and of Messrs. W. E. Constable & Co. to supply certain tar-paving materials, viz., bottoming at 19s. 6d. per ton ; topping, 22s. 6d. per ton ; dust, 12s. 6d. per ton ; quartz, 30s. per ton, be accepted. . . ."

After transacting other business, the Council adjourned for the summer recess.

METROPOLITAN ASYLUMS BOARD.

THE fortnightly meeting of this Board was held on Saturday, Mr. Henson presiding.

The Works Committee submitted a series of recommendations with regard to several works in progress. In connexion with the Joyce Green Hospital, the Committee had authorised certain variations in Messrs. Leslie's contract, and at the North Eastern Hospital they had authorised certain extra works on Messrs. McCormick & Son's contract. They also authorised certain extra works on the laundry building contract to meet the requirements of the Engineer to the Board.

The same Committee reported in favour of a continuation of the services of a temporary assistant draughtsman in the Surveyor's department ; and in connexion with Tooting Bec Asylum authorised certain variations in the contract, including the fixing of two hydrants in the laundry, at a total cost of 97*l.* The net extras previously reported amounted to 798*l.* 1s. 5d.

In connexion with the buildings at White Oak School, the Works Committee reported that the proposals of the architects, Messrs. Newman & Newman, were to heat the day-rooms and dormitories in the double cottages by means of radiators, in addition to open

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fireplaces; the two large schoolroom halls and classrooms by radiators on the low-pressure system; the infirmary by means of open fireplaces, supplemented by radiators in the ward and corridors, and the administration block generally by means of open fireplaces supplemented by radiators in the corridors and by hot-water pipes in the cubicles of the domestic staff. The Committee recounted the instructions they had given, and stated that the financial result generally would be that, whilst in the case of the High Wood School an additional expenditure of 400*l.* would be entailed, in the case of White Oak School a saving, which could not yet be definitely ascertained, but which they had reason to believe would more than counterbalance the additional expenditure on the High Wood School, would be effected.

On the recommendation of the Asylums Committee the tender of Mr. Mark Batchelor, of Maidstone, in 568*l.*, was accepted for providing and fixing new sanitary fittings and converting certain windows into doorways at the pavilions at Darenth Asylum, and that of Mr. W. Rogers (Colchester), in 115*l.*, was accepted for cleaning, painting, and distempering work required at the female attendants' home at the children's department at the same establishment.

KNIGHT'S BRICKLAYING MACHINE.

On Tuesday last, July 30, we were present at a demonstration of the capabilities of this machine, which was given at Barfield, near Farnham. In getting ready for work two iron pillars are placed at the end of the wall that is to be built, intermediate pillars being used when necessary. Fixed to these uprights is a light girder capable of being raised as the work proceeds; on the top of this runs the machine. This machine has a pinion which gears into a chain stretched along the girder, and by turning this pinion by a winch handle the machine travels backwards and forwards. The bricks are fed by hand to the machine, and by means of a lever, and by revolving rollers, the bricks are caught and pushed home up against the last laid bricks. Guide rollers at the side keep a "face" on the work; other rollers on top press the bricks down on the mortar.

It has been arranged that the latter shall be run out by a hopper worked by hand, but on the day of our visit the mortar was laid on in front of the bricks to be set, by trowels in the usual way. The pressure of the rollers alluded to, together with that promoted by the bricks as they are being squeezed into position by the machine, drive the mortar into the spaces of the work. It is stated that the machine worked by two men and a lad will lay 500 to 600 bricks an hour. We may notice, however, that to attain to that speed the machine will have to be worked a great deal quicker than when we saw it on Tuesday, when four men were employed. We refrain from giving particulars as to cost of working, profit per day as compared with hand laying, and the like, as the machine is confessedly only in the experimental stage at present, and all such particulars must, therefore, be regarded as being more or less theoretical.

In regard to the quality of the work done, we can only speak of what we saw, and it was stated that the men employed were unaccustomed to the machine. Frankly, we did not think much of the quality of the brickwork in the short length of wall we saw erected. The bond was not kept very true, the spaces between the bricks varied a great deal in size, some bricks being pressed close together whilst others were nearly ¾ in. apart. The "face" was not remarkable for its finish, here and there a header slightly projected from the wall, and in other places it was pressed slightly inwards. The spaces as seen in the "face" were sometimes full of mortar, and sometimes not. However, in spite of these obvious drawbacks, practically all of which could be easily remedied by the employment of men who understand the working of the machine, we believe that for rough walls it will be found serviceable—and that is all that is claimed for it at present. It is obvious that where the mortar is fed by hand much care must be exercised to see that it is laid on equally and evenly. Even as we saw it, we have no doubt that the wall would stand well enough; the iron pillars alluded to act as the plumb line, whilst the horizontal light girder assists in keeping the "face," so the wall is upright. When it is made a little heavier, and the experimental stage is passed, we believe that Knight's bricklaying machine will prove to be exceedingly useful, especially where long stretches of walling are to be erected. We are glad to have had an opportunity of seeing it.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Murphy Memorial Hall, Walworth.

A one-story building on part of the forecourts of Nos. 92 and 94, New Kent-road, Walworth (Mr. A. S. Tayler for the Committee of the Murphy Memorial Hall).—Consent.

Wooden Pediment at Entrance to Building, New Kent-road, Walworth.

A projecting wooden pediment at the entrance to a building on the site of Nos. 128 to 132, New Kent-road, Walworth (Mr. L. A. Withall for Messrs. R. Thwaites & Co.).—Consent.

Lines of Frontage and Projections.

Lewisham.—A deviation from the plan approved by the Council on May 8, 1900, for the erection of twelve houses with shops on the south side of Brownhill-road, Catford, so far as relates to the erection of a building, with gateway under, in place of one of the houses with shops approved by the Council (Mr. A. J. Glock).—Consent.

Hackney, South.—A building, to be used as a technical institute, on the south side of Cassland-road, Hackney, at the corner of Terrace-road (Mr. P. Kirk for the Governors of the Hackney Institute).—Consent.

Hampstead.—†Buildings, with shops on the ground floor, and of buildings with porches and bay-windows, on a site bounded on the north and west sides by West-end-lane and on the east side by Honeybourne-road, Hampstead (Messrs. Boehmer & Gibbs for Mrs. E. J. Cave).—Consent.

Bow and Bromley.—A one-story workshop on the north-east side of Armagh-road, Old Ford, next No. 172 (Mr. A. P. Stokes for Messrs. J. Deaton & Sons).—Consent.

Wandsworth.—†Buildings on the east side of Upper Tooting-road, Tooting, northward of Letchworth-street (Messrs. Walton & Lee for Mr. G. S. Miller).—Consent.

Chelsea.—Buildings, to be used as public baths and washhouses, on the south side of King's-road, Chelsea, at the corner of Manor-street (Mr. T. W. E. Higgins for Council of the Metropolitan Borough of Chelsea).—Consent.

Brixton.—A two-story bay window in front of No. 207, Brixton-road, Brixton (Mr. H. G. Assiter for the Ecclesiastical Commissioners).—Consent.

Dulwich.†—One-story shops on part of the forecourts of Nos. 76 and 78, Church-street, Camberwell (Mr. W. A. Murphy).—Consent.

Finsbury, Central.—One-story additions in front of No. 180 (the Lord Vernon Arms public-house) and No. 182, Pentonville-road, Clerkenwell (Messrs. Richard Clarke & Parkes for Mr. T. R. Grimwood).—Consent.

Finsbury, Central.—A three-story oriel-window in front of a proposed warehouse building on the north side of Rosebery-avenue, Clerkenwell, at the corner of Rosoman-street (Mr. W. H. Winder for Mr. J. Milroy).—Consent.

Greenwich.—A two-story workshop on the site of No. 17, Colomb-street, Trafalgar-road, Greenwich (Mr. J. J. Faulkner).—Consent.

Greenwich.—Wood, iron, and glass pents at the entrances to Nos. 198 to 208 (even numbers only, inclusive), Victoria-road, Charlton (Mr. W. Elviss).—Consent.

Hammersmith.—A brick and tile porch to St. Saviour's Parochial Buildings, Hartswood-road, Shepherd's Bush (Mr. J. S. Alder for the Rev. A. C. Holthouse).—Consent.

Hampstead.—A dwelling-house on the north side of Arkwright-road, Hampstead, to abut upon Frognal (Mr. A. C. H. Watkin for Mr. M. Davis).—Consent.

Hampstead.—A brick, wood, and tile porch at the entrance to a house known as Castlewood, Wadham Gardens, Hampstead (Mr. A. F. Faulkner for Mr. W. Willett).—Consent.

Lewisham.—One-story shops on the forecourts of Nos. 113 and 115, Loampit Vale, Lewisham (Messrs. Hodson & Whitehead for Mr. W. Nevins).—Consent.

Islington, West.—A four-story building on the site of a one-story shop in front of No. 559, Holloway-road, Islington (Mr. F. S. Hammond for Mr. A. J. Hone).—Refused.

Paddington, South.†—A covered way in front of No. 7, Bayswater Hill, Paddington (Mr. T. P. Bullivant).—Refused.

Clapham.†—School building on the site of Nos. 62 and 63, Clapham Common, South side, Clapham (Mr. J. O. Smith for the Girls' Public Day Schools Company, Limited).—Refused.

Hackney, North.—A block of residential flats, with one-story shops, on the north side of Manor-road, Stoke Newington, on the site of No. 4 (Messrs. Gordon & Gunton for Mr. F. Matthews).—Refused.

Hammersmith.—A porch and buttresses in front of a proposed building, to be known as the People's Hall, on the west side of Latimer-road, Hammersmith (Messrs. Fleetwood, Son, & Eversden for Mr. W. H. Winterbotham).—Refused.

Hampstead.—A detached house, with bay-windows, and a stable building, on the west side of Frognal, Hampstead, southward of No. 33 (Mr. A. C. H. Watkin for Mr. M. Davis).—Refused.

Lewisham.—Three houses on the north side of Tredown-road, Sydenham, to abut upon Homecroft-road (Mr. W. Cooper).—Refused.

Width of Way.

Limehouse.—A building on a yard at the engineering works, Batson-street, Three-Colt-street, Limehouse, at less than the prescribed distance from the centre of the street (Mr. A. T. Bolton for Mr. G. S. de Ritter).—Consent.

Marylebone, West.—A one-story addition to the Abbey Tavern, Violet Hill, St. John's Wood (Mr. A. Dixon for Messrs. Whitbread & Co., Limited).—Consent.

Fulham.—A two-story stable building at the rear of No. 99, Claybrook-road, Fulham Palace-road, Fulham, at less than the prescribed distance from the centre of Lurgan-avenue (Mr. J. Hook for Mr. J. Hunt).—Refused.

Finsbury, East.—Warehouse buildings on the north side of Great Arthur-street and south side of Bayer-street, Golden-lane, at less than the prescribed distance from the respective centres of those streets (Messrs. N. S. Joseph, Son, & Smithem for Mr. S. H. Beddington).—Refused.

Kensington, South.†—A two-story studio at the rear of No. 46, Campden Hill-square, Notting Hill, with the forecourt fence at less than the prescribed distance from the centre of Aubrey-road (Messrs. Battam & Co. for Mr. F. T. Battam).—Refused.

Lines of Frontage, Width of Way, and Projections.

Camberwell, North.—An extension of the period within which the erection of buildings and boundary-walls at the Camberwell Infirmary, Havil-street, Camberwell, at less than the prescribed distance from the respective centres of Havil-street, Brunswick-road, and Brunswick-square, was required to be completed (Mr. E. T. Hall).—Consent.

Clapham.—One-story shops on the south side of Crescent-lane, Clapham, eastward of Elms-road (Mr. J. H. Swan for Messrs. Lyne & Smith).—Refused.

Hackney, North.—A block of dwellings on the north side of Stamford-terrace, Stamford Hill, Hackney (Mr. C. G. Smith for Messrs. Mitchell, Goodman, Young, & Co., Limited).—Refused.

Kensington, South.—An additional story to an existing studio at No. 3, Pelham-street, South Kensington (Mr. A. Seward for Mr. W. J. Donne).—Refused.

St. Pancras, West.—A one-story stable building at the rear of No. 31, Princess-road, Regent's Park, to abut upon St. George's-road and Calvert-street (Mr. W. C. Pepper for Mr. G. H. Itter).—Refused.

Space at Rear.

St. Pancras, East.—A modification of the provisions of section 41 (1) (vi.) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of five blocks of dwelling-houses for the working class, on the east side of Great College-street, at the corner of King's-road, St. Pancras, with an irregular space at the rear (Mr. C. Barrett for the Council of the Metropolitan Borough of St. Pancras).—Consent.

Deviations from Certified Plan.

City of London.—Deviations from the plans certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed erection, on the site of a one-story building, of an addition at the rear of the Talbot public-house, Nos. 64 and 65, London Wall, City (Messrs. Lewcock & Callcott for Mr. T. E. Davies).—Consent.

Width of Way, Space at Rear, and Projections.

Bermondsey.—A building, with bay-windows, to be inhabited by persons of the working class, on the east side of Tower Bridge southern approach, Bermondsey, with portions of the forecourt fence at less than the prescribed distance from the respective centres of Abbey-street and Long-walk (Messrs. Humphreys-Davies & Co. for the South Eastern Railway Company).—Consent.

Line of Frontage and Space at Rear.

Wandsworth.—Dwelling-house on the south side of Ormerley-road, Balham, to abut upon Laitwood-road (Mr. W. E. Johnson for Mr. G. E. Treves).—Refused.

Line of Frontage and Temporary Structure.

Hackney, South.†—Retention of a wood and canvas shelter on a portion of the forecourt of

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No. 19, Lea Bridge-road, Hackney (Mr. J. Perkoff).—Consent.

Width of Way and Construction.

Finsbury, East.—The retention of a temporary wooden bar-room on the site of the King's Arms public-house, No. 18, Moreland-street, City-road, at less than the prescribed distance from the centre of Cross-street (Messrs. W. Antill & Co.).—Refused.

Formation of Streets.

Brixton.—That an order be issued to Mr. A. E. Mullins sanctioning the formation or laying out of two new streets for carriage traffic to lead out of Coldharbour-lane and Vaughan-road, Brixton, respectively (for Mr. J. Pearman).—Consent.

Woolwich.—† That an order be issued to Messrs. Logsdail & Beale refusing to sanction the formation or laying out of a street 40 ft. wide for carriage traffic to lead from Footscray-road to Southwood-road, New Eltham (for the executors of the late Mr. R. C. Davis).—Agreed.

Buildings for the Supply of Electricity.

Southwark, West.—A sub-station at Vine-yard, Marshalsea-road, Southwark (Mr. C. Thompson for the London and Brush Provincial Electric Lighting Company, Limited).—Consent.

Cubical Extent.

Hackney, North.—A factory-building in Tysser-street, Dalston-lane, Hackney, with one division to exceed in extent 250,000 cubic feet, and to be used only for the purposes of a cabinet and joinery works (Mr. E. O. Sachs for the Shannon, Limited).—Refused.

Dwelling-houses on Low-lying Land.

Woolwich.—One hundred and six buildings in Marmadon-road, and eight buildings in Churchmanorway, Plumstead (such buildings to be used wholly or in part as dwelling-houses, and to be situated on low-lying land) (Mr. J. O. Cook for Mr. T. H. Driver).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

Books.

A Dictionary of Architecture and Building. By RUSSELL STURGIS, A.M., Ph.D.; and other writers. In three volumes. Vol. II.: F—N. New York; The Macmillan Company: London; Macmillan & Co. 1901.

THE second volume of Mr. Russell Sturgis's "Dictionary" keeps up the promise of the first one, and moreover has been produced with commendable punctuality. It is too often the case that a dictionary hovers for years in progress; but the rate at which this "Dictionary" is appearing argues a very business-like method, and we may hope to have the complete work at no distant date.

The second volume includes the two very large subjects "Gothic Architecture" and "Grecian Architecture" (we prefer the more usual form "Greek Architecture"), but the editor, who contributes the former article himself, has resisted the temptation to allow such articles to be expanded into a lengthy treatise, and has preserved the concise form proper to a dictionary of this kind. Mr. Sturgis rightly says that the essence of Gothic architecture is in the vaulting, and he illustrates the peculiar advantage of the employment of the independent vaulting-ribs on which the vaulting surfaces are built, in a rather unusual and very convincing manner, by instancing the case of the vaulting of an apsidal aisle on a semi-circular plan, and showing how impossible would be any satisfactory roofing of this by the mere intersection of round-arched vaulting surfaces, one of which, the radial vault, would necessarily be a kind of diminishing funnel; while by designing and building the ribs first the curves can be laid out so as to produce a symmetrical construction, and get over all the practical difficulties which the plan would otherwise present. The manner in which the structure of the vault gradually influenced and developed all the main characteristics of the architecture is succinctly but clearly described. As there is only one plan given with the article, it would have been preferable to give a more typical one than that of Noyon Cathedral, with its very short choir and apsidal transept ends—the latter no doubt a fine and picturesque feature, but unusual, and therefore not well chosen as a representative Gothic plan.

The article on Grecian architecture is by Mr. Allan Marquand. The up-to-date character of the article is shown by the author commencing with the consideration of the prehistoric and Mycenæan age, which in fact hardly belong to Greek architecture in the purely architectural sense. The description of the Dorian and Ionian Greek style, or what we usually call Greek architecture, is satisfactory but a little too much pervaded by a desire to make points. It seems hardly necessary to trace the employment of a plinth to the necessity for a solid base to the Mycenæan brick buildings, still less to suggest that the regular coursing of stone in Greek architecture is a reminiscence of the Mycenæan brickwork. The desire of the Greeks for perfection of execution would be quite enough to account for this careful sizing and laying out of the masonry. No plan of a temple is given, and while some profiles of mouldings are given, there is no special mention of the frequent use of conic section curves in profiling them, which is an important point. In regard to the more delicate and, in the case of the Parthenon, we may almost say cryptic curves made use of in the lines of the building and of the columns, the remark is made, and we think not without reason, that it is difficult to decide what was the motive for this, and whether or not it was, as Vitruvius thought, to correct optical illusions. If we were to take the Parthenon alone, we believe that in that very refined example correction of optical defect was the object, but we cannot accept this explanation in reference to such an example as that of Corinth, where the bulge of the columns is prominently visible and is a feature in the design. Visible curves and what we may call cryptic curves in Greek architecture must probably be considered from a different point of view. Mr. Longfellow writes the succeeding article on "Græco-Roman Architecture." He is disposed to defend the Romans from modern criticism of their architecture as employing the Greek Orders in a false and illogical manner—at least he seems to see no harm in it. We consider the current criticism on Roman architecture as perfectly sound; it was a clumsy and false school compared with that of the Greeks; we agree that its scope was much wider and its achievements more various, but in a constructional rather than in an "intellectual" sense.

In the brief remarks on "Hagioscope" it is suggested that it "is not certain that they were originally intended" for the purpose of affording a view of the altar. Considering that they are always sighted towards the altar, there can hardly be any doubt about the purpose; what is doubtful (which is not referred to) is what persons or class of persons were specially intended to benefit by them. A very good article on "India" is supplied by Mr. A. D. F. Hamlin, longer than the average, but concise enough nevertheless; and a good one on "Iron Construction" by Mr. W. R. Hutton. The great subject of "Architecture of Italy" is divided into fourteen sections, some of them written by Mr. J. Safford Fiske, others by Mr. A. L. Frothingham, Jun.; by dividing the subject into short sections in this manner a very good and useful synopsis of the subject is obtained. Under "Metal Work" the editor gives a very short article for a subject of such varied interest, and the illustrations both of old and modern work are nearly all French—the modern ones by no means admirable, and the example of a bronze altar railing in Brunswick Cathedral is really a flagrant instance of metal being treated in masonic forms, a mistake also made in the balustrade of the new bridge at Paris. Such an article should have offered illustrations only of true and typical metal-work.

Among other important articles are one on the architecture of Mexico, by Mr. Thornton F. Turner; on "Monastic Architecture" by the Editor, a brief and rather inadequate treatment of so great a subject; "Moorish Architecture," by the same contributor, also curiously short in comparison with the length of some articles on less important and interesting subjects; "Mosaic," by Mr. Crowninshield; and "Mural Painting" by the Editor.

We shall hope before long to see the final volume of the dictionary.

The Works on Architecture of Robert and James Adam. Reprinted and published by A. Thézard *fils.*

THIS is the fourth book of M. Thézard's facsimile re-issue of "Works in Architecture." It includes the section of the Edinburgh Registry Office, the design for a screen to Carlton House, two or three fine drawings of decorative detail for that now extinct mansion, two admirable designs for chimney-pieces, and some other fine decorative work, including an interesting design for a harpsichord. In regard to the execution of the plates, and the whole make-up of the book in regard to paper, type, &c., we have already expressed the highest commendation.

Gillow's: Its History and Associations. London: Harrison & Sons. 1901.

ALTHOUGH this thin but handsome quarto, which appears without any author's name, may be presumed to be in reality a kind of superior form of advertisement, it contains enough matter of general interest to claim notice as a book. The fact of one firm having been occupied in the same class of work for two centuries, with constantly increasing prosperity, is in itself one which the present representatives of the firm have a right to be proud of. The book gives the history of the house of Gillows, with notes on some of the celebrated people whose names appear as customers in their books. Amongst those mentioned are Warren Hastings, Clive, and Reginald Heber. It is not generally known that the original foundation of the firm was made in Lancaster, by Robert Gillow, a joiner at Great Singleton, who removed to Lancaster, started business there as a carpenter, and became a freeman of the city. Some entries from the old shop books are given; one in 1731, which includes—

To a Boofet making glew and nails to wood for the Boofet	£2 0 0
To making mahogany dining table and oak wood linings and screws... ...	0 12 6

Prices have gone up since then. The commencement of the London establishment does not seem to have been earlier than about 1765, when premises were erected on the present site, now part of Oxford-street, then called by the name of "Tyburn Lane," of unhappy association. The furniture for the London house was made at Lancaster, and sent to London by sea, the voyage taking from ten to fourteen days. The members of the family who went up from time to time to look after the business, rode from Lancaster to London, attended by an escort on account of the dangerous state of the roads. The journey occupied fourteen days. This reminds one of Frank Osbaldistone's ride in "Rob Roy." Gillow's furniture, it may be observed, is still made in Lancaster, where they have a large factory.

Gillow's made many pieces of furniture from original designs by Adam, Sheraton, and others of the old English furniture designers, whose drawings are still in their possession. Among the stories related is that of a nobleman who asked the price of a table to which he had taken a fancy, and being told it was 80*l.*, replied "That is a devil of a price," to which the then Mr. Gillow replied, "But, my lord, it is a devil of a table."

If Messrs. Gillows wish to retain their hereditary position, however, there is one move which they will probably have to make, to keep with the times, viz., to go to first-class artists for designs, and to give names and the individual credit to the designers. Hitherto, if we are not mistaken, they have gone upon the old sytem of putting out furniture as the design of the firm and not of individual artists; a system which, for the highest class of work, is doomed.

A Price Book for Architects and Engineers. By T. E. COLEMAN, F.S.I. London: E. & F. N. Spon, Limited, 125, Strand. 1901.

THIS handy volume is really an extended edition of the same author's "Price Book for Approximate Estimates," and we think he would have been well advised if he had retained this title. The very nature of the work is such that the prices cannot be considered anything but approximate. This same remark applies in a greater or lesser degree to all price books; but in this case, where the items are generally of a somewhat comprehensive nature, it applies rather in a greater than a lesser degree. In spite of this fact this little work is one of the most useful that have been issued for some time.

The author commences with a very complete chapter on "The Preparation of Estimates," giving the various proportions of the value of the labour and material in the various trades, and also the average proportion of each trade to the total cost of the building with a comprehensive wage table and some

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very pertinent remarks as to the rise in the cost of building during the past few years.

We are glad to see in his notes on the preparation of approximate estimates that the author advocates the use of "rough quantities" rather than those very delusive methods of "cubing," "per square," and "per unit." The delusive nature of these latter methods, except in exceptional cases, will be fully appreciated by those having experience in the preparation of preliminary estimates. We should prefer to see a still further extension of the system, *e.g.*, instead of including the doors and windows in the price per foot super of the walls they might be taken separately. With very little extra work, these could be numbered, and an "extra cost" of each added; similarly with roof trusses instead of including them with the price per square of the roofing. We dwell more on this portion of the work than we otherwise should, as it is in the preparation of approximate estimates that this work will more particularly apply.

The prices given both under the heading of "Average Cost" and that of "Actual Cost" are of a very miscellaneous and diverse nature, both in substance and form, as, mixed up with "Railways per Mile," "Canel Locks, complete, each," and "Town Halls, per foot Cube," we get "Limewhiting, one and two Coats," and "Architrave Mouldings," 2 in. by 1¼ in., 2 in. by 1½ in., 3 in. by 1¼ in., and 3 in. by 1½ in., a needless division of sizes at any rate; while such items as chimney-pieces, litany desks, and pulpits might certainly be left out altogether, as there can be no standard of price for these. There are, however, many useful-priced items throughout the book, and the prices generally are reliable and appear to be the result of experience. We really cannot see the value of such an item as No. 669, "Extra for Bays and Chimney-flues, each;" as certainly the size and character is a factor to be reckoned with. This appears to have been ignored by the author.

There is an interesting collection of "actual cost" prices at the end of the book. We say "interesting" advisedly, as without further particulars, date, &c., a good many of them would not be of much practical value—*e.g.*, the cost of roofing Charing Cross and Cannon-street stations would hardly apply at the present day. With the date of erection given, it might be possible to arrive at a percentage of variation. A few more examples of leading items, such as "Drainage," would be useful, but we suppose the difficulty of obtaining this information must be a valid excuse for the paucity of these.

Cross referencing, which to a limited extent is commendable, is carried in this work to an irritating extent; so that although the "Average Cost" section numbers 727 items, actually the number priced would not reach more than from 200 to 250.

The general get-up of the work is good, and it is the handy pocket size, for which Messrs. Spon are well known. It will be found useful, but generally more in the preparation of approximate estimates than for those of a more detailed nature. A work of this kind has not hitherto made its appearance, so that the one under notice will supply a want. With a little careful rearrangement and amplification it could be made even more useful.

Transactions of the Society of Engineers for 1900. Edited by PERRY F. NURSEY, Secretary. London: E. & F. N. Spon, Limited. 1901.

IN addition to papers on mechanical engineering this volume contains a considerable amount of matter more particularly interesting to our readers. The presidential address by Mr. Henry O'Connor deals principally with recent improvements in the manufacture of coal-gas, special reference being made to the various processes of enriching coal-gas which are now so largely adopted. Mr. O'Connor falls foul of the "would-be clever people" who object to the use of carburetted water-gas for this purpose. "The one fact," he says, "which they have failed to grasp is that, while water-gas, *per se*, has no smell, carburetted water-gas has, if possible, a stronger and more penetrating smell than coal-gas." He admits that carburetted water-gas contains more of the dangerous carbon monoxide, but does not think it likely that this "will cause any greater number of accidents through escapes." He does not speak of acetylene gas with much enthusiasm, for two reasons, the high price of carbide of calcium and the dangerous nature of the gas itself. A point in its favour is the great simplicity of manufacturing it on a small scale. As a gas engineer he speaks highly of the Welsbach incandescent light, and considers that it "has done more for the extension and retention of gas lighting than any other invention of the last twenty years," although further improvement is necessary, as the mantles are still too fragile. The paper by Mr. R. F. Grantham, on "The Closing of Breaches in Sea and River Embankments," deals with the methods adopted by the author in closing some of the breaches in the sea and river walls of Essex and Kent, caused by the disastrous inundation of November 27, 1897, and also passes in review some earlier cases, including Captain Perry's work at Dagenham in 1717-1719. The methods adopted by the author at Northey Island, Essex, and at Iwade, near Sittingbourne, Kent, are fully described. In each case Mr. Grantham formed an "inset wall" on the landward side of the breach, instead of attempting to connect the broken ends of the embankment by a new straight wall. The walls were in the main constructed with bags of clay and ballast kept down by stakes, and were about 3 ft. or 4 ft. wide at the top, with slopes of 1 in 2. The great Maidstone epidemic crops up again in the next paper, which deals with the methods adopted by Dr. G. Sims Woodhead and Mr. W. J. Ware for disinfecting the water-mains of that town. Chloride of lime was the disinfectant used. "The Economical Disposal of Town Refuse," by Mr. B. D. Healey, deals principally with the utilisation of the heated gases obtained by the cremation of refuse, and passes in review the most important types of furnace and boiler now in use. Mr. Henry C. H. Shenton is the author of a valuable paper on "Recent Practice in Sewage Disposal," written from the engineer's point of view; it is somewhat marred by a number of mis-statements, but as most of these were corrected in the discussion, they cannot do much harm. An index to the Transactions of the Society from 1857 to 1900 concludes the volume, which is altogether one of great interest.

Land Area Tables. Compiled by WILLIAM CODD. London: E. & F. N. Spon. 1901.

THIS is a small folding-chart for facilitating calculations in regard to areas of land. One table shows the acreage represented by any number of square inches on a map for five different scales. There is also a table of square yards reduced to acres, roods, and perches, and one of decimal fractions of an acre converted into roods and perches. The chart ought to be very useful in simplifying the calculation of areas of land.

The Workmen's Compensation Acts, 1897 and 1900, with Notes. By W. A. WILLIS, Barrister. Seventh Edition. London: Butterworth & Co. and Shaw & Co. 1901.

WHEN a book has reached a seventh edition the function of the critic may be regarded as pretty well concluded, and it becomes little more than necessary to note the publication of the new edition. The book contains legal propositions which are stated clearly and briefly. We will give one example:—"When the statute requires that the building shall exceed thirty feet in height, that limit must be actually reached at the time when the accident happens, and it is immaterial that the building is intended to, and will when finished, exceed the statutory limit."

The Parish Churches of Northamptonshire: illustrated by Wills, temp. Henry VIII. By the Rev. J. CHARLES COX LL.D., F.S.A. London: Harrison & Sons. 1901.

THIS is only a pamphlet, reprinted from the *Archæological Journal*, but it contains in a compressed form a good deal of valuable historical information. The idea has been to collect memoranda of bequests from wills of the period, made for the assistance of specified work on churches. This is of course most reliable evidence in regard to the fact of such work being in progress or in immediate contemplation. A curious bequest is one at Rushden (1533): after mention of a bequest to the "Hye Roode," there follows one to the "Grene Rode." The different spelling "Roode" and "Rode," in the same will, is of course only the characteristic carelessness of the period in spelling. As to what the "Green Rood" was the author has no suggestion to offer.

TRADE CATALOGUES.

THE New York and Franklin Air Compressor Company, of New York, send us a copy of their catalogue, relating to air compressors suitable for being actuated by steam, belt, gearing, electricity, water power, or any other source of power supply. The Company has recently commenced operations in new works at Franklin, Pennsylvania, designed, built, and equipped exclusively for the manufacture of air and gas compressing appliances. Part of the catalogue refers to the general designs and details of construction adopted by the firm, and mention is also made of the increasingly numerous adaptations of compressed air as a means of transmitting power.

The General Electric Company, of Queen Victoria-street, have sent us their revised catalogue of "Geeko" telephones. The great merit of these telephones is that they can be used in conjunction with existing electric bells. The fixing up requires no special skill, and full instructions are issued with each complete set. The "sick-room" set, for establishing immediate communication between two compartments, ought to prove specially useful in cases of infectious illness, enabling the patient to call up the nurse or converse with friends. "Geeko" telephones are also made suitable for long-distance work, and they are much cheaper than the ordinary telephone sets.

The General Compressed Air House Cleaning Co. (St. Louis, U.S.A.) send us an illustrated pamphlet of their method of cleansing carpets and walls by compressed air, by which means also, as we gather from the illustrations, the dust is collected into a receptacle as blown out from the wall or carpet, and removed. It is claimed that carpets can be thoroughly cleansed by this means without removing them from the floor, and that one man with the apparatus can clean from eight to twelve rooms a day. This is no doubt a great saving of time and labour, but we think most English housekeepers would prefer the removal of the carpets from the floor. The compressed system may be useful for cleansing them when removed.

Messrs. Jonas Smith & Co., timber merchants, send us a catalogue of the timber in stock at their depots at Barking, Liverpool, Newcastle-on-Tyne, Hull, and Bristol, under date July 25.

BOOKS RECEIVED.

HYDRAULIC AND OTHER TABLES FOR PURPOSES OF SEWERAGE AND WATER SUPPLY.—By Thomas Hennell, M.Inst.C.E. (E. & F. N. Spon.)

Correspondence.

To the Editor of THE BUILDER.

PORTLAND CEMENT TESTING.

SIR,—I should like to say a word or two with reference to the points raised by Mr. Reed in his letter.

I say in the article that with proper plant, &c, an office boy or labourer can do all that is necessary in testing. I say this advisedly, seeing that, with a very long experience of testing cement, the whole of my testing has been done by men of this class, and, as a rule, cement makers throughout the kingdom do the same thing in testing their cement, only very few of them keeping chemists for analytical work, which I do not consider as being part of the testing in the ordinary sense.

The tensile strain depends, as Mr. Reed suggests, upon the gauging entirely, and two men will make up briquettes of the same cement and get very different results, and hence, as I said in the article, the Arnold system of gauging is altogether preferable to hand gauging, as with it the variation mentioned does not exist as long as due care is taken. In the hand gauging the question of whether a man is getting the maximum test from a cement appears not so much to depend upon whether he is a labourer as upon whether he has gauged long enough to have obtained the necessary experience and skill.

It has always been a wonder to me that cement users have not taken up the Arnold system more than they have done, seeing that, had they had the seven years' experience I had in gauging a large number of briquettes by the two systems side by side and with the same cement, I am certain they would think, as I do, that hand gauging is a system that should be given up.

With regard to the cooling of cement, I have not spoken of this in the article on testing for the fol-

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lowing reasons:—In my opinion, which is based upon long experience, if the raw materials are thoroughly ground and amalgamated in their proper proportion, the resulting mixture properly burnt and thoroughly ground so as to contain its proper percentage of flour, no cooling is necessary with ordinary English cement, although I would advocate the laying of cement down for two or three months as strongly as anyone, not because the cement ought to need it, but as a safeguard against possible shortcoming in one or the other of these three things. Even in the hot weather, when, as a rule, there is more chance of trouble with cement, if these three conditions are carried out, there is no absolute need for long storage, and, further, if the cement is tested as soon as received systematically, it will most certainly show whether such cooling is necessary or not.

THE WRITER OF THE ARTICLE.

SIR,—As sole local concessionaire of the National Opalite Glazed Brick and Tile Syndicate, I use Portland cement, also Robinson's No. 1 fireproof cement for fixing Opalite. Can you or any correspondent tell me how and at what cost I can get a sample of Portland tested here in Birmingham or at some conveniently situated institution? One's time does not admit of personally attempting such investigations. Doubtless many of your readers, who are interested in the prevention of loss through cement swelling after time has elapsed, would be glad of similar information.

I sincerely wish there were facilities in this forward city for a trader or operative to learn all about the chemistry of cements at small expenditure of time and money. CHARLES A. LINE.

Birmingham, July 29.

*** Has not the Midland Institute a department of Technical Chemistry?—ED.

TILE GLAZING.

SIR,—We have been asked by a correspondent abroad whether there exists any kind of glaze which can be applied in a dissolved state to wainscotting and fire-place tiles made of cement and sand, the glaze being transparent and unaffected by hot or cold water.

If any of your readers should know of a preparation of this kind, we would feel greatly indebted for any information on the subject.

WM. REID & CO.

TRADE UNIONISM OR OFFICIAL TYRANNY.

SIR,—I hope you will give me space to bring to the notice of your readers the case of twenty-eight members of the National Association of Plasterers who worked at the Earl's Court Exhibition previous to its opening. They were asked to work two hours extra each day for two weeks from the opening, and were ready to agree to all rules of the National Association of Plasterers re working overtime. Permission was asked from the District Committee to work two hours extra each day, but we were told the Committee did not meet for thirteen days, and we could get no answer till then. The Exhibition Company, not feeling inclined to postpone the opening, decided to canvass and whitewash the ceilings and walls, as the plasterers could not finish in time for opening day.

The plasterers working there, seeing this, decided to work, and informed their District Committee of their intention to do so. The reply of the District Committee was that each member was fined 5s. This was appealed against to the Arbitration Committee, who, to their everlasting credit, heard both sides of the question and reversed the decision of the District Committee. The District Committee appealed to the Executive Committee, who decided to reverse the decision of the Arbitration Committee.

I will leave it to your readers to say whether it is in accordance with common fairness for a committee, who have heard both sides of a question, to be overruled by those who have only heard one side, and that their own; and is it reasonable to think that work is going to be stopped until a committee of plasterers think fit to meet and decide whether London shall move or stand still?

COMMON-SENSE.

WOOD PAVING.—The new pavement of Walterton-road, Paddington has just been completed. It was finished under seven weeks, the area being 5,229 superficial yards, 246,000 5-in. Jarrah blocks being used, supplied by the Acme Wood Flooring Company at 12*l.* 17*s.* 5*d.* per 1,000. The roadway in question being an old granite road, it had to be broken up for a depth of nearly 15 in., the excavation carted away, and 6 in. to 8 in. of concrete foundation laid for the reception of the blocks, which were driven up quite tightly every sixth course; then two coats of hot tar and pitch were poured over the wood and well rubbed into the joints with squeegees; afterwards a wash of Portland cement grouting was well rubbed in to fill up all interstices, and the roadway was then finished off with fine Thames shingle.

The Student's Column.

GAS AND GAS FITTINGS.

5.—WATER-GAS; CARBURETTED WATER-GAS; PRODUCER-GAS.

WATER-GAS is produced by passing steam through incandescent coke. The oxygen of the water vapour unites with the carbon of the coke to form the inflammable gas, carbon monoxide, while the hydrogen of the water vapour is left in an uncombined condition. Water-gas therefore consists essentially of a mixture of the two inflammable gases, carbon monoxide and hydrogen; it contains other gases in small quantities, but the whole of these should never amount to 10 per cent. of the total volume of the gas.

Water-gas has no odour, and burns with a non-luminous flame, while its heating power is about one-half that of coal-gas. It is sometimes called "blue water-gas" to distinguish it from carburetted water-gas which burns with a bright luminous flame instead of with the blue non-luminous flame of plain water-gas. Water-gas is more poisonous than coal-gas because it contains a larger proportion of carbon monoxide, the most poisonous constituent present in appreciable quantity in coal-gas. To diminish the danger attendant upon the use of a poisonous gas devoid of odour, the water-gas when used alone is usually impregnated with mercaptan or carbylamine, very small quantities of which will give a penetrating odour to large volumes of the gas.

Carburetted Water Gas is a mixture of water-gas with oil-gas. The water-gas is passed through the heated chamber in which the oil is decomposed, and the mixture of water-gas and oil-gas is then passed through a superheater to make the gas more permanent. Carburetted water-gas has an odour quite as penetrating as that of coal-gas, and burns with a luminous flame. Its heating and lighting value varies with the proportion of oil-gas it contains, but compared with coal-gas of equal illuminating power the heating value of carburetted water-gas is about 10 per cent. less than that of coal-gas.

Producer-Gas, sometimes called "fuel-gas," is produced by passing a current of air, or of air and steam, through incandescent coke or other carbonaceous matter. About one half of the total volume of the gas is non-combustible nitrogen, while the other half consists mainly of carbon monoxide and hydrogen. The gas has so low a combustible power that in some cases, where the nitrogen exceeds 60 per cent., it is necessary to use the gas in a hot condition as it comes from the producer to prevent the gas from becoming incombustible. Some of the better class producer-gases, such as Mond gas, can be used whether hot or cold, but they are all of very low heating value. In most cases the producer-gas has a heating value of about one-half that of water-gas, or one-fourth that of ordinary coal-gas. Producer-gas is largely used for industrial purposes, because it can be made very cheaply and from almost any description of carbonaceous matter. Dowson gas, Siemens gas, Wilson gas, and Mond gas must all be classed as producer-gases. A great number of producers have been devised both in this country and abroad, but the gases produced always consist mainly of a mixture of carbon monoxide and hydrogen largely diluted with atmospheric nitrogen.

Water-Gas Manufacture.

"European" Process.—Water-gas is made by heating a bed of coke to incandescence with the aid of a blast of air, then cutting off the air and sending a current of steam through the heated coke. The products of combustion obtained when the coke is subjected to the air blast are not allowed to mix with the gas produced by the action of the steam on the coke. Producer-gas is the term given to the products of combustion obtained when the air is in use, and in the "European" process the producer-gas formed can be used for heating the oil for carburetting the water-gas or for other purposes. The producer-gas contains sufficient carbon-monoxide to render it, while hot, capable of combustion with the evolution of heat. While the steam is passing through the coke, the coke is rapidly cooling down, and it soon becomes necessary to stop the flow of steam and again raise the temperature of the coke with the aid of the air-blast. By the old method of working the European process the "blow" was in operation for nearly ten minutes, and the steam for four or five minutes, but it has since been found possible to shorten the time of the blow considerably.

"Dellwik-Fleischer" Process.—In 1896 Mr. Carl Dellwik introduced the method of making water-gas now known as the "Dellwik-Fleischer" process. In this process the coke is heated to the temperature necessary for the manufacture of water-gas in a much shorter time than by the older process. The bed of coke is made less deep and is maintained at a constant level, and a more powerful air blast being used ensures that air is always present in excess. The result is that carbon dioxide instead of carbon monoxide is formed in the producer. Also by passing the steam alternately first from the bottom upwards and then from the top downwards through the heated coke the temperature throughout the bed is equalised, and the brick lining of the generator is not worn away more rapidly at one point than at another. Carbon monoxide is first produced as in the older "European" process, but owing to the larger ratio of air to coke in the Dellwik producer this carbon monoxide is immediately oxidised to carbon dioxide. Now, 1 lb. of carbon when burned to carbon monoxide evolves 4,350 British thermal units, while the same quantity of carbon when burned to carbon dioxide evolves 14,500 B.T.U. The coke in the producer is therefore raised to the necessary temperature more quickly when the coke is converted into carbon dioxide instead of into carbon monoxide. Working on this system the time occupied by the "blow" has been reduced to less than two minutes, and the time during which water-gas is made has been prolonged to ten minutes, and over 70,000 cubic feet of water-gas can be made per ton of coke in place of the 34,000 cubic feet made by the "European" process.

On the other hand, owing to carbon dioxide instead of carbon monoxide being formed, the producer gas from the Dellwik plant is not combustible, and cannot, therefore, be used for heating the oil used for carburetting the gas when an illuminating gas has to be manufactured. The value of the combustible producer-gas does not, however, approach that of the additional yield of water-gas obtained with the Dellwik plant.

The specific gravity of Dellwik water-gas has been found by Professor Lewes to be 0·5365, and the composition of the gases obtained by the two processes to be as follows:—

—	"European" Process.		"Dellwik-Fleischer" Process.	
	Inflammable Producer Gas.	Water Gas.	Non-flammable roducer Gas.	Water Gas.
Hydrogen	2·88	51·54	—	51·76
Carbon monoxide	29·33	39·98	1·40	38·58
Carbon dioxide ..	4·15	5·61	18·35	4·73
Oxygen	—	—	1·20	0·81
Nitrogen	63·64	2·87	79·05	4·12
	100·00	100·00	100·00	100·00

The following analysis of Dellwik water-gas, showing the small quantities of hydrocarbons commonly present, has been published by Professor Lunge:—

	Dellwik Water-gas.
Hydrogen	50·80
Methane	·82
Ethylene.....	·05
Carbon monoxide.....	39·65
Carbon dioxide	4·65
Oxygen	·20
Nitrogen	3·83
	100·00

The accompanying drawings (figs. 10 and 11) show a Dellwik-Fleischer water-gas plant in vertical section and plan. The gas-producing capacity of plant of the dimensions here shown is 40,000 cubic feet per hour.

Carburetted Water Gas Manufacture.—The apparatus most commonly used in this country for the manufacture of carburetted water-gas is a modification of the Lowe plant so extensively used in the United States. The plant consists of three main parts, the generator, the carburettor, and the superheater (*fig.* 12); and as the gas is made by an intermittent system, the sets are usually erected in duplicate.

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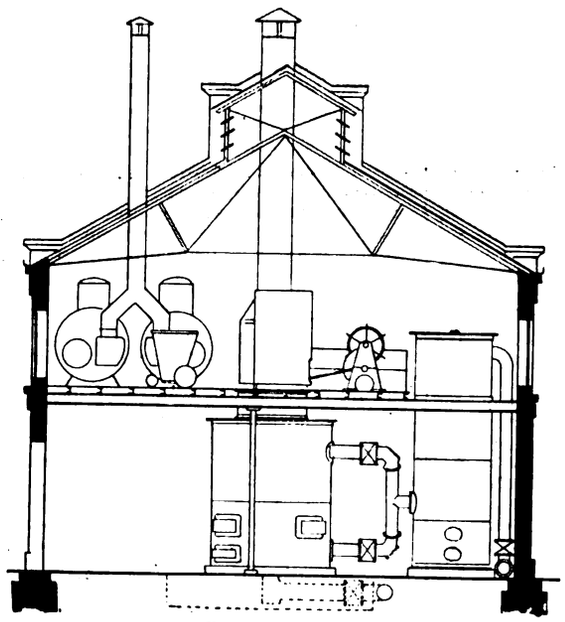

Fig. 10.—Section.

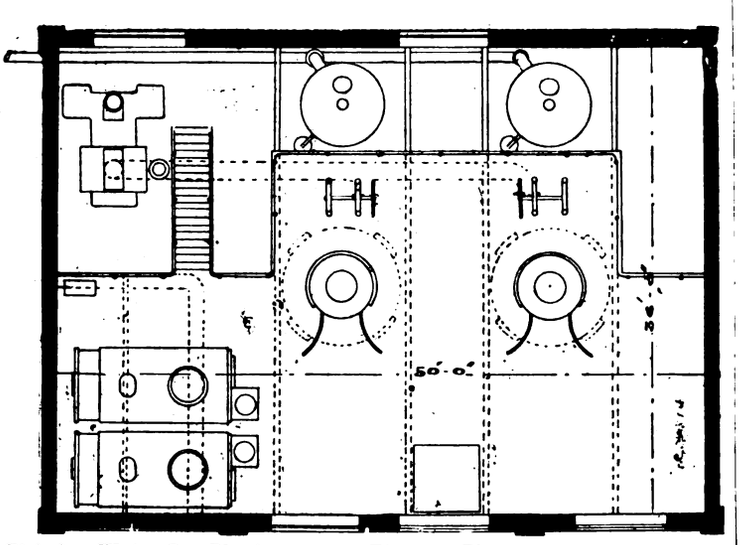

Fig. 11.—Plan.

The Dellwik-Fleischer Water-Gas Plant.

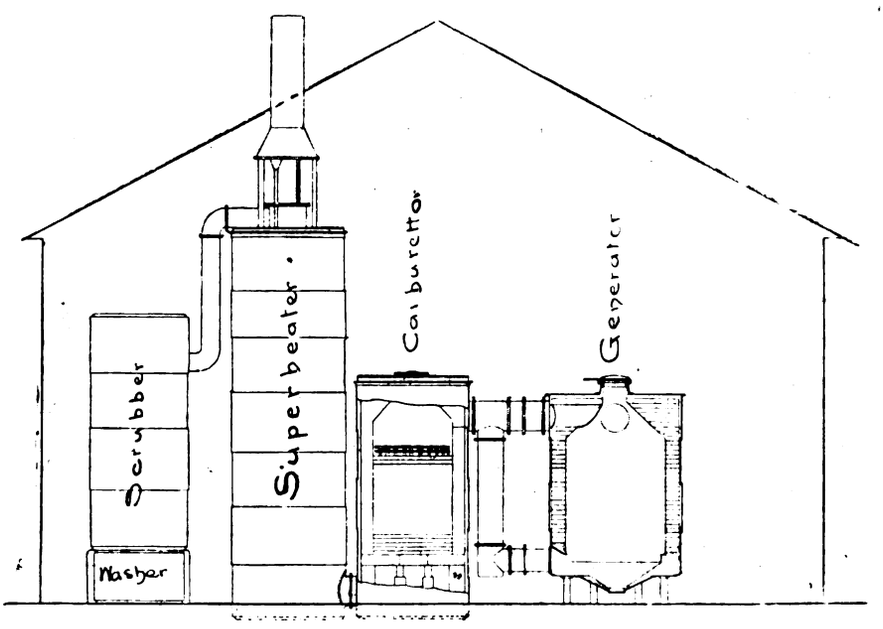

Fig. 12.—Lowe Carburetted Water-Gas Plant.

In the generator, plain water-gas is made in the manner previously described. The carburettor is a chamber of about the same height as the generator, say, 18 ft. in height, and 10 ft. in diameter, and is packed with small fire-bricks arranged in chequer form. The hot producer-gas from the generator is led into the upper part of the carburettor, where it meets with a blast of air and is partially consumed, the heat evolved by the combustion serving to heat the bricks in the carburettor. The products of combustion, together with the gas not yet consumed, pass into the superheater, which is a chamber about 6 ft. higher than the carburettor and is likewise packed with bricks. In the superheater the gases meet with another blast of air, the combustion is completed, and the temperature of the bricks is thereby raised. The products of combustion escape into the open air through a shaft. The generator, carburettor, and superheater having been raised to the required temperature, the supply of air is cut off and steam is admitted to the generator. Water-gas is immediately produced and passes to the carburettor, where it meets with heated oil which is being pumped in at the top of the carburettor, and which is dispersed in the form of spray. In the carburettor the oil is converted into gas, and mixes with the water-gas, which carries it forward to the superheater. The mixture of oil-gas and water-gas leaving the carburettor is not of a permanent character, the rich hydrocarbons being liable to partially condense and to separate from the water-gas as the temperature of the mixture decreases. By passing the mixture through the superheater the hydrocarbons are still further decomposed, and a carburetted water-gas is produced which is more stable under ordinary atmospheric conditions than coal-gas. The gas is subsequently purified by a series of operations very similar to those employed for the purification of coal-gas, but as the gas contains very little ammonia or bisulphide of carbon it does not urgently require purifying from these impurities. The tar obtained in the manufacture of carburetted water-gas frequently contains 50 to 60 per cent. of water, or more, and this must be removed before the tar can be distilled.

According to Butterfield, the composition of carburetted water-gas of 26 c.-p. (sp. gr. 0·62) made by this process is approximately :—

Hydrogen	34·0 per cent.
Methane	15·0 "
Hydrocarbons absorbable by fuming sulphuric acid	12·5 "
Carbon monoxide.....	33·0 "
Nitrogen	0·5 to 5·0 "

The oil commonly used for carburetted water-gas manufacture is that known as "solar distillate," having a specific gravity of about 0·870, and a flashing point of about 170 deg. Fahr., but the oils which it is possible to use vary greatly in composition, gravity, and flashing point. In practice about 45 lbs. of coke and 3¼ gallons of oil are used for every 1,000 cubic feet of 22-candle gas produced.

Carburetted water-gas has been used in America since about 1878, its popularity there being due to the abundance and cheapness of petroleum. The first plant used in this country was erected in London in 1891. By the end of the year 1900 carburetted water-gas plant had been erected in the United Kingdom by eighty-one companies or Local Authorities, the total gas-producing capacity of the plant being 134,570,000 cubic feet per day.

From time to time objections have been raised to the public supply of carburetted water-gas, and in 1899 a Departmental Committee was appointed to inquire into the use of water-gas and other gases containing a large proportion of carbon monoxide. After hearing many experts, the Committee recommended that when water-gas is supplied a maximum limit for carbon monoxide should be fixed; that where such limit is fixed some person should be appointed to test for carbon monoxide; and that, before any kind of water-gas is distributed in any place, due notice should be required to be given.

The recommendations of this Committee have apparently been completely ignored by Parliament and the Government Departments up to the present time, while the desirability of introducing a statutory calorific standard has not yet been discussed by Local Authorities or by Parliament, although Professor Lewes in his Report to the Birkenhead Corporation (1897) and Dr. Harold Colman, of the Birmingham Gasworks, have both shown that carburetted water-gas has a lower heating value than coal-gas of equal illuminating power. The answer to the question as to whether the use of carburetted water-gas should be allowed should depend mainly upon the relative prices likely to be charged for coal-gas and carburetted water-gas, and the terms of the contract made. If a standard price has been fixed for 16-candle coal-gas, an article of less value is being obtained if 16-candle carburetted water-gas is being supplied, and, therefore, the standard price should be slightly lowered.

NORWEGIAN TIMBER TRADE.

IT is notorious that the United Kingdom is Norway's largest customer, and this is particularly the case in regard to timber and timber goods, the annual value of the export of which to this country is more than 2,000,000*l*. The details of this trade for the year 1900 are now accessible, and reports upon them have been received from the Hon. Charles Dundas, British Consul-General, and the Vice-Consuls at Fredrikstad and other ports concerned in the business. From these various documents it is to be gathered that the past year gave the Norwegian timber exporters very good profits, as also the workmen good wages and steady employment. The total quantity exported did not differ greatly from that of the two previous years, but prices throughout maintained an unusually high level. Towards the close of the year, however, a downward tendency appeared to be impending. The entire export amounted to 2,002,243 cubic metres in 1900, as against 1,955,029 cubic metres in 1899, thus :—

	1900 Cub. Metres.	1899 Cub. Metres.
Planed timber	574,214	580,388
Sawn "	534,283	561,766
Hewn "	101,255	106,294

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	1900 Cub. Metres.	1899 Cub. Metres.
Round ,, ...	603,261 ...	510,059
Staves, &c.	80,671 ...	81,561
Laths	102,589 ...	114,331

It will be observed that while planed and sawn timber decreased as regards the quantity exported, the opposite was the case in round timber. The United Kingdom took about double the quantity of all other countries put together. From Christiansand the export of sawn deals to the United Kingdom amounted to 237,087 cubic ft. Fredrickstad maintained its position as the centre of the Norwegian flooring trade, the quantity shipped from that place being over 55 per cent. of the whole of the Norwegian export. The total of flooring boards sent from this port was 315,722 cubic metres, of which 196,059 went to the United Kingdom. By the commencement of last year shippers had already sold a considerable proportion of their production for spring and summer shipment at a basis price of 9*l.* per nominal standard for the usual dimensions, 1 in. by 7 in. mixed white c.i.f. to cheap ports on the British west coast. They were, therefore, in no hurry to sell at the opening of the season, the result being that prices for floorings kept on hardening during the spring and summer months, especially for colonial stuff, for which there was a good demand. Owing largely to the scarcity of tonnage and the consequent rise in freights, prices for fresh sales rose during the autumn to 9*l.* 15s. and 10*l.*, which prices, however, buyers but very reluctantly accepted, and then only in case of need. At that period, it should be explained, stocks were smaller than they had been for several years. On the whole the shippers did very well, although some of the sales gave poor results in consequence of having been made in advance without calculating on the considerable rise in freights. The available supplies for f. o. w. and summer shipment this year are considerably below the average, and, according to shippers' opinions, hardly exceed what buyers will need to fill their early requirements. As they have consequently been holding out for higher prices than buyers can afford to pay, comparatively few sales have been effected yet for early shipment. A few contracts are said to have been closed at about 9*l.* 10s. for mixed white c. i. f. to good ports on the west coast, and the price obtained for redwood boards may be put down at about 12*l.* c. i. f. to similar ports.

Reporting from the Skiensfjord district (including Langesund, Balvig, Porsgrund, and Skiend), Mr. Franklin writes:—The timber trade of 1900, although good, has not given the profits generally believed to be the case. The highly-inflated first cost of logs, added to high wages and exorbitantly high freights, have necessarily resulted in smaller net proceeds to the exporters than one is led to imagine when judging from the high sale prices. At the present moment the demand is slack at reduced prices all round, and as the supply seems to be somewhat in excess of the demand, there is in consequence a weakness prevailing which does not augur well for 1901 business. But, of course, all will depend upon the turn things take in the United Kingdom and other large consuming countries in the immediate future. Very divergent views are expressed even by the well-informed as to the prospects ahead. The production and export of all kinds of wood goods from this district in 1900 has been larger than usual, but it is of interest to note that the stocks of planed goods for export from Norway on December 31, 1900, were about 8,500 standards less than on the same date 1899, and as much as 19,000 standards less than on the same date 1898, according to figures lately rendered by the Norwegian Planed Goods Association. No figures are available giving such information as to other kinds of wood goods. Skiensfjord ranks fourth in the quantity of wood exported from Norway. It is on record that as far back as 1500 to 1600 Langesund—the outer port of Skiensfjord—was the most important timber exporting port in Norway, several hundred cargoes being shipped yearly, the wood being brought down from Skien and other places far up country. But things are long since altered. each town in the fjord loading up its cargoes within its own precincts, principally from Porsgrund. The district from Skien up through Telemarken is one of the best, if not the best, canalised in Norway, whereby timber can pass in rafts at great distances. The loughs are so commodious that local passenger and goods steamers can pass also, thus creating a considerable traffic. In the latter part of 1899 a sharp rise made itself felt in the values of timber of all kinds for deliveries during 1900; this kept up until the autumn of 1900, when the downward tendency set in and things have not rallied since.

WESLEYAN CHURCH, ERDINGTON, WARWICK.—The foundation stones were laid recently of a new Wesleyan Church at Erdington. The new church will be built in front of the existing building, and will be of brick with stone dressings. The main front will be to the Station-road. The seating accommodation is for 650 persons. Provision is made in the design for a tower with spire, and also by the addition of transepts for additional accommodation. The architects are Messrs. Ewen Harper & Brother, of Birmingham, and the builder is Mr. Isaac Langley, of Tyburn. The cost is estimated at nearly 3,000*l*

OBITUARY.

MR. LOFTHOUSE.—We have to announce the death, at his residence, The Croft, Linthorpe, near Middlesbrough, in his fifty-sixth year, of Mr. Robert Lofthouse, F.S.I. Mr. Lofthouse, a native of Wensleydale, was senior member of the firm of R. Lofthouse & Sons, of Middlesbrough, in which town he established himself in practice as an architect and surveyor in or about 1875. Some five or six years ago he took his two sons—Mr. J. A. Lofthouse and Mr. T. A. Lofthouse—into partnership. Mr. Lofthouse was a financial valuer under the Act to the Middlesbrough Town Council and an Ecclesiastical Surveyor for the Diocese of York. Of recent architectural works carried out by him and his firm we may mention the following:—A house at Linthorpe, illustrated in the *Builder*, November 25, 1899; premises in Middlesbrough for Messrs. Dickson & Benson, 1895-6; the Children's Hospital and Porter's Lodge, Broomlands, Linthorpe, for the Middlesbrough Board of Guardians, 1897-8; All Saints' Vicarage House, Middlesbrough, illustrated in our columns of July 10, 1897; the Overseers' Offices; the Conservative Club in Corporation-road; and the Offices of the *North Eastern Gazette*, Middlesbrough. Mr. Lofthouse was a founder and for some time President of the Cleveland Naturalists' Club. As a member of the Yorkshire Archæological Society, and skilled in the use of both brush and pencil, he prepared many drawings and views for the illustration of Canon Atkinson's "History of the Cleveland District."

MR. C. W. LEE.—We have to announce the death, at Hastings, on July 28, of Charles Williams Lee, F.S.I., formerly of the firm of Messrs. Lee Brothers & Pain, of London, architects and surveyors. Mr. Lee had a considerable practice as a rating surveyor and in compensation cases, and also laid out and supervised the development of several building estates in the neighbourhood of London. Mr. Lee had retired from the firm for some years prior to his decease.

GENERAL BUILDING NEWS.

CHURCH, CULTS, N.B.—The members of the Aberdeen U.F. Church Presbytery met in the vestry of the St. Paul's U.F. Church on the 15th ult. Mr. D. M'Millan, architect, was present, and submitted to the presbytery the plans and specifications of the new U.F. Church to be erected at Cults. The building, Mr. M'Millan said, was designed to accommodate 614 persons. The end gallery was not at present so large as it might be, but could be extended afterwards and at very little cost. The hall was seated for about 275 persons. There is also a workroom or ladies' room, seated to accommodate forty-five persons, and provision is made for an organ. It is expected the church will be lighted with electricity. The estimated cost of the building is 4,500*l*.

PRIMITIVE METHODIST SUNDAY SCHOOLS, CHESTERFIELD.—The foundation-stones have just been laid of an extension of the Sunday School premises at the Holywell Cross Primitive Methodist Chapel, Chesterfield. The cost of erecting and furnishing the building will be about 1,600*l.*, exclusive of the cost of the site. The architect is Mr. W. C. Jackson, of Chesterfield, and Mr. W. Forrest, of Chesterfield, is the builder.

CHURCH, REDHILL.—The foundation-stone of a new Presbyterian church was laid at Redhill recently. The design is by Mr. George Lethbridge. The accommodation will be at present 500, with 100 extra in a gallery, which is not at the moment being proceeded with. The pews in the transept and half-way back in the nave are arranged in circular form, with the pulpit as centre. The contract price is about 5,500*l.*, and the contract is in the hands of Messrs. Willmott & Sons, of London and Hitchin.

TRINITY CONGREGATIONAL CHURCH, LEEDS.—The memorial-stone of Trinity Congregational Church, Leeds—the building now in course of erection at the junction of Hillary-place and Woodhouse-lane which is to take the place of the demolished East Parade Chapel—was laid on the 20th ult. The building, a Gothic structure, has been designed by Mr. G. F. Danby, of Leeds. The lecture-hall and classrooms will be ready for opening in the autumn, but it will probably be another year before the church itself, which will provide accommodation for about 800 worshippers, is completed. For the site between 8,000*l.* and 9,000*l.* has been paid; the buildings will cost about 13,500*l.*

CHURCH, GOOLE.—A church, dedicated to St. Paul, has been erected in the North Ward, Goole, and the completed portion—a nave and aisles—was consecrated on the 25th ult. The church will, when completed, hold 730 people, and will consist of nave and aisles, chancel, with north aisle; the south aisle is occupied by the organ-chamber and vestry accommodation. At the present time only the nave and aisles have been built. The style is Early Decorated, and the building is externally built of red brick, with red terra-cotta dressings to the windows and doors, the roofs being covered with red tiles. The windows in the aisles are of three lights, with simple tracery, the remaining windows being lancet lights. The arcades and chancel arch are of stone. A small temporary chancel has been formed for present use. The architects for the work are Messrs. Brodrick, Lowther, & Walker, of Hull and Bridlington; the builders were Messrs. Jackson & Dimberline, of Goole; the terra-cotta being supplied by Mr. J. C. Edwards, of Ruabon.

UNITED METHODIST FREE CHURCH AND SCHOOLS, WESTCLIFF-ON-SEA.—The design submitted (in a recent competition) by Messrs. George Baines & Reginald Palmer Baines, architects, Clement's Inn, Strand, W.C., for this church have been adopted by the committee, and the first portion of the scheme, including church, vestries, &c., is to be proceeded with at once.

ST. CUTHBERT'S, WITHINGTON.—Messrs. Telford Gunson & Son, architects of Manchester, write to say that they are the architects for the additions to this church, and not Mr. Goldie, as stated in our last. Messrs. Goldie were the original architects for the church, but are not carrying out the additions.

SLATING WORK AT ASYLUM NEAR ABERDEEN.—The Aberdeen City District Lunacy Board has accepted the offer of Messrs. Adam & Co., Aberdeen, to execute the slating work of the new asylum at Kingseat, Newmachar, for about 2,500*l.* Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen, is architect.

GUINNESS TRUST BUILDINGS IN FULHAM PALACE-ROAD.—New buildings have been erected in Fulham Palace-road by the Guinness Trust. The buildings form the eighth group of workmen's dwellings erected by the Guinness Trust, and occupy a site at the Hammersmith end of Fulham Palace-road. The site has a frontage to Fulham Palace-road of 196 ft. and a depth of 330 ft., with a total superficial area, including the extension in the rear, of 70,250 ft. The buildings consist of four parallel blocks, and three smaller blocks are to be put up in the rear, divided into 364 tenements, all of the type known as associated—not self-contained. There are six floors. Hard-pressed red Leicester bricks have been used in the erection of the buildings, with dressings of artificial stone of a pale buff tint. The mansard roofs are covered with Portmadoc slates, and the dormer windows are faced with zinc. A bright appearance is given to the staircases and landings by the use of dados of white tiles. The floors throughout are of fireproof construction, the iron and concrete flooring of Messrs. Homan & Rogers being used, and Wright's fireproof partitions are adopted between lavatories, &c. The paving of the staircases, landings, and yards is of granolithic material. The buildings, when completed, will contain 767 rooms, divided into 364 tenements, as follows:—69 one-room tenements, weekly rents, 2s. 6d. to 3s. 3d.; 191 two-room tenements, weekly rents, 4s. to 5s. 6d.; 100 three-room tenements, weekly rents, 5s. 3d. to 6s. 3d.; 4 four-room tenements, weekly rents, 6s. 3d. to 6s. 6d. These rents include chimney sweeping and the free use of venetian blinds, baths, clubroom, and hot-water supplies. All the rooms are fitted with venetian blinds. Each living room is supplied with a close range fitted with removable oven, a food cupboard with ventilating bricks, a coal bunker and dresser. The windows have special arrangements for ventilating when closed, and above the tenement doors are ventilating fanlights, so as to secure a thorough draught from the staircases and lobbies, all of which are lighted by windows opening directly into the streets and playgrounds between the several blocks. The bath-rooms, thirteen in number, are in the basement of the third and clubroom blocks, and each is fitted with a solid white glazed earthenware bath, supplied with hot and cold water. The baths are free to tenants at days and hours separately allotted for males and females. There is a clubroom. The room, which is supplied with newspapers, games, &c., will be open free to tenants every evening and for one hour in the morning. The urnroom is fitted with copper kettles, from which boiling water will be served at breakfast and tea times. Adjacent to the urnroom is the drying-room, for the purpose of drying tenants' clothes, if desired, at a very small charge. Next to the drying-room is the boiler-room, fitted with a horizontal independent boiler, which supplies heat to the drying-room and clubroom, and hot water to the baths and the permanent hot-water service taps. Beneath the clubroom is a coal store for the sale of coal to tenants at practically cost price. At the east end of the site a number of lock-up sheds for perambulators or cycles will be provided and let to tenants at a weekly rent of one penny. In each of the three areas is a shelter, provided with seats, and with clock, placed so as to be visible from most of the rooms overlooking the areas. Flowers and shrubs are arranged where possible in the areas, and garden seats at intervals. The buildings are illuminated by the electric light. The cost of the land and buildings erected and in course of construction is estimated at 75,600*l.*, and the rents are adjusted to a scale that will, it is expected, after providing for depreciation, give a net return on the expenditure of 3 per cent. per annum. Over 100 applications have already been received for rooms in the completed blocks. The dwellings have been erected from the designs of Messrs. N. S. Joseph, Son, & Smithem, of Finsbury-pavement, the builder being Mr. H. L. Holloway, of Deptford. Mr. T. Bailey officiated as clerk of the works, and Mr. A. E. Ackerman as general foreman. The following contractors have been employed on the works:—

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Foundations, Mr. H. J. Greenham; fireproof floors, Messrs. Homan & Rodgers; artificial stone, plastering, and grano work, Mr. J. Bickley; sanitary fittings, Messrs. Shanks & Co. and Farnley Iron Company; ranges, stoves, mantels, and iron railings, Messrs. Yates, Haywood, & Co.; tiling, Messrs. Wedgwood & Co.; hot-water work, Messrs. Rosser & Russell; zinc dormers, Messrs. Ewart & Co.; fireproof partitions, Cunnah-Wright Partition Syndicate; electric light wiring, Messrs. Russell & Russell; electric light fittings, General Electric Company; carving, Mr. Gilbert Seale; venetian blinds, Fuller's Manufacturing Company.

NEW HOSPITAL, CONSTANTINOPLE. — Mr. H. Percy Adams, of London, has been commissioned to design the new British Hospital at Constantinople. The buildings will be on a somewhat extensive scale, and stand on a site adjoining the Consulate. The existing prison and hospital buildings are to be taken down to make room for the new hospital.

SANITARY AND ENGINEERING NEWS.

THE EAST LONDON WATERWORKS.—Considerable progress has been made with the construction of two new reservoirs at Walthamstow, and the works were inspected on the 25th ult. by the chairman and directors of the East London Water Company. The existing storage reservoirs are situated at Walthamstow, and are ten in number, having a total area of 319 acres, and a total capacity of 1,200,000,000 gallons. The two new reservoirs will, when completed, practically double this capacity, not so much by area as by depth. Their combined area will be about 180 acres, but as a result of their depth their capacity will be about 1,200,000,000 gallons, thus bringing up the previous figures to just upon 500 acres area and 2,400,000,000 gallons capacity. The water supply for the existing reservoirs is taken from the River Lea just above Chingford pumping-station, where it passes either through the Chingford culverts at a high level or through the feeder canal at a low level. The quantity of water passing down the River Lea in one day in winter is often sufficient to provide the entire supply of the East London Water Company for forty days. The new reservoirs are placed on the marsh land between Ferry-lane and Chingford Mill. They are bounded on the west side by the River Lea navigation, and on the east by Higham-hill. Between the two reservoirs is a plot of land about 25 acres in extent, which site has been given by the Company to Tottenham for a recreation ground. As the new reservoirs interfere with the existing course of the River Lea and the feeder canal, it has been necessary to divert both the latter. The new cut for the river is very nearly 1¼ mile in length, for the greater part of which the sides are formed of concrete walls faced with Kentish rag stone. In place of the old feeder a new aqueduct has been built, which starts at Chingford Mill with a width of 36 ft. It will take in the water from the river Lea, and will feed not only the new reservoirs but the old also. Owing to the difference in levels, however, the last 13 ft. of water in the new reservoirs will have to be lifted by pumps. The width of the aqueduct is reduced to 20 ft. after passing the site of the proposed new pumping station, and it finally discharges into the High Maynard reservoir, which is one of the existing group. The 36-ft. aqueduct will convey 180 million gallons of water per day up to the intake of the new pumping station, where it is intended to pump 100 million gallons per day, when the river is in good flow, into one of the two new reservoirs. The remainder of the water will pass along the 20-ft. aqueduct as before described. The motive power for actuating the pumps will be at Chingford Mill, and will consist of two engines and dynamos combined, each of 250 horse-power. The reservoirs have been constructed by excavating the land and forming the soil thus removed into the surrounding embankment walls. The level of the bottom of the reservoirs varies in depth from 8 ft. to 12 ft. below the original surface of the land, and the embankments are raised so as to give a depth of about 30 ft. of water. The slopes of the embankments are 4 to 1 inside and 2½ to 1 outside the reservoirs. To render the reservoirs watertight, a puddle wall is enclosed within the embankments throughout. A trench was first excavated down to the London clay, which, in the deepest part, is about 60 ft. below the ordinary ground level. This trench is filled in with puddle, which is well keyed into the existing clay, and is brought up to the top of the embankment. Consequently, the whole of the water in the reservoirs will be contained inside a puddle wall, the entire reservoir being watertight. The two reservoirs will be connected by a tunnel about 550 yards in length. There is also a short tunnel for discharging the water into the canals leading to the filter-beds, which are situated at Lea Bridge. The works are being carried out under the supervision of Mr. Bryan, the company's engineer, by Messrs. S. Pearson & Son, of Westminster, the contractors. The work of construction is being pushed on, and there is every reason to expect that in the spring of next year the reservoirs will be ready to store water for the summer's use. On account of the rapid increase of the population in the company's district it was decided some time ago to make a very large addition to the existing storage and to that which will be completed in 1902. The company therefore introduced a Bill into Parliament in 1899 for the construction of 5,000,000,000 gallons additional storage, higher up the valley of the Lea. This Bill was rejected by Parliament; but an identical Bill was introduced in 1900, and was passed. The scheme, as sanctioned, involves the purchase of upwards of 1,000 acres of land on which to construct the reservoirs and other works, and the bulk of this land has already been acquired. —*Times.*

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Messrs. James Brooks & Son, 35, Wellington-street, have entered into partnership with Mr. G. H. Godsell, of Hereford, and the firm will henceforth bear the title of "James Brooks, Son, & Godsell." Mr. Brooks, for considerations of health, will to a great extent retire from active practice, but will continue to supervise the work of the office.—— Messrs. Essex, Nicol, & Goodman, architects, Birmingham, have removed their offices from 8, Newhall-street, to Colmore House, 21, Waterloo-street, Birmingham.

ABERDEEN TOWN AND COUNTY HALL.—At their annual meeting on July 25, the Aberdeen County and Municipal Buildings Commissioners, in accordance with a report by Mr. William Kelly, architect, Aberdeen, resolved that the Joint Town and County Hall should be redecorated and that the electric light should be introduced in place of gas.

THE HOUSING PROBLEM, MANCHESTER. — Mr. W. O. E. Meade-King, C.E., attended on the 23rd ult. at the Manchester Town Hall on behalf of the Local Government Board to hear evidence for or against the proposal of the City Council to borrow 60,000*l.* for the purpose of building houses at Blackley in place of those which have been or will be demolished by street improvements in the centre of the city. There was no opposition to the scheme in principle, but Mr. Tom Cook, architect, submitted that the houses proposed to be built should be placed east and west instead of north and south, or else be semi-detached, so that the sun's rays might have free access to the living-rooms during some portion of each day. The Deputy Town Clerk (Mr. Hudson) explained the scheme in detail. The Corporation, he said, were under obligations to provide house accommodation for the labouring class in place of the dwellings which had to be demolished because of the Rochdale-road, Fairfield-street, and Long Millgate improvements. In respect of the Rochdale-road improvement seventy-two houses had to be demolished, providing for 346 persons; in Fairfield - street the number of houses affected was fifty-nine, and of persons 219; and as to Long Millgate the number of houses was eighteen, and of persons ninety-four. Altogether the number of houses taken down was 149, and of persons displaced 659. In order to make up for this demolition and removal, the Corporation proposed to erect upon their estate at Blackley 150 cottages, affording accommodation for 750 persons. At the same time they proposed to erect fifty-three houses, accommodating 265 persons, to meet demands arising from the operations of the Sanitary Acts. Access to the new houses would be gained by means of the electric trams and the Lancashire and Yorkshire Railway Company's new line. The rental of the houses taken down averaged 5*s.* 9*d.*, and it was intended to give at Blackley better accommodation and a small garden for 5*s.* 6*d.* a week. Under these circumstances the Corporation desired that they might be allowed to borrow the money for the longest period allowed by law—sixty years.

NEW BUILDING BY-LAWS AT MIDDLESBROUGH. —It was reported at a recent meeting of the Plans Committee of the Middlesbrough Corporation that a deputation had seen Mr. Grant Lawson, M.P., the Parliamentary Secretary of the Local Government Board, in his rooms at the House of Commons, with reference to the objections to the new building by-laws for Middlesbrough. Mr. Grant Lawson said that the only point that need be discussed was the question of paving back passages. The by-law required that all back passages not exceeding 12 ft. should have 6 in. of concrete foundation. Mr. Grant Lawson argued that there was no necessity for it in towns like Middlesbrough, and he gave them to understand that there was no chance, if they stood out for a concrete foundation in narrow back streets, of the new by-laws being sanctioned by the Local Government Board, and as they wanted them approved and in operation as soon as possible they gave way, and a few days afterwards the new by-laws obtained the consent of the Local Government Board. The changes in the by-laws had since been communicated to all the builders and architects in the town,—Councillor Baker wished to know how back passages were now to be made.— The Deputy Town Clerk (Mr. Alf. Sockett) replied that there was no alteration of the old by-law save the omission of the six inches of concrete foundation. —After further discussion, Councillor T. Baker moved that all plans sent in before the new by-laws received the approval of the Local Government Board be passed. This was seconded by Councillor Bruce, and carried.—*Yorkshire Herald.*

COMMONS AND FOOTPATHS PRESERVATION SOCIETY —A meeting of the Executive Committee of the Commons and Footpaths Preservation Society was held on Thursday, the 25th ult., at 1, Great College-street, Westminster, under the presidency of the chairman, the Rt. Hon. G. J. Shaw Lefevre. It was reported that the Society had received a number of objections to the enclosure of Stonehenge, and to the proposed diversion of the right of way running through the remains. Letters from Professor W. M. Flinders Petrie and others were read urging that steps should be taken to secure the protection of free public access to the stones, and opposing any alteration of the existing roadway. It was resolved to approach the local authorities on the subject, and to make full inquiries as to the effect of the enclosure and proposed alteration. It was stated that projected light railway schemes would injure various commons in the counties of Middlesex and Suffolk, and the Society decided to take such steps as might be necessary to protect the public rights involved. The secretary, Mr. L. W. Chubb, reported that the Society had assisted in securing the insertion of clauses for the preservation of common land, rights of way, or open spaces in the following among other Bills during the current session :—London, Brighton, and South Coast Railway (various powers), Barrow-in-Furness Corporation, Leeds Corporation Water, Bournemouth Corporation, Christ's Hospital (London), Manchester Corporation, and Bethlehem Hospital. Exception was taken to the Portmadoc Beddgelert, and South Snowdon Railway Bill, which would, it was feared, seriously interfere with the amenities of the Snowdon district. It was stated that it is proposed to run an electric railway from Portmadoc to the foot of Llyn Gwynant, and in connexion with the railway it is sought to dam up the waters of Llyn Llydaw and Llyn Teyrn, two well-known lakes lying on the eastern slope of Snowdon. The overflow, which forms the river Glaslyn, would be conducted in pipes through the romantic ravine known as Cwm Dyli, and the water would be utilised at a large electric power station to be erected near the head of Llyn Gwynant. The Committee resolved to oppose this and several other Bills, unless satisfactory terms could be come to with the promoters. Grants were made towards the protection of an open space near Midhurst, and the regulation of Leagrave Common, Bedford. A provisional arrangement for the preservation of Goodwick Moor and Hill, Pembroke, was approved. Under the scheme a considerable portion of the commons will, it is hoped, be vested in the Parish Council, with the object of protecting them from further encroachments. It was reported that over fifty fresh cases of enclosure of common land and roadside waste, or obstruction of rights of way, had been referred to the Society for assistance during the past month, and the Committee was altogether dealing with upwards of 100 cases, thirty-six different counties being affected.

MEMORIAL TABLET IN CHURCH NEAR ABERDEEN.—On the 24th ult. there was unveiled in Maryculter Parish Church a memorial tablet erected in memory of the late Rev. George Duncan, who was minister of the parish for twenty-five years. The tablet was designed by Mr. Macgregor Chalmers, architect, Glasgow, and is formed of alabaster with glass mosaic centre, the picture in the latter representing Christ enthroned.

BUILDING BY-LAWS, SOUTH SHIELDS. — The building trade in South Shields is seriously hampered at present owing to the difficulty caused by the new building by-laws, which came into operation early this year. Certain amendments to the by-laws were suggested by the Corporation, and the Local Government Board inserted various clauses, one of which was with reference to lateral space. It provided that such space should be 20 ft. between the staircase, or any building, and the wall of the back-yard. Conferences have taken place, on several occasions, between the builders of the town and the Corporation, and the former contend that, given 16 ft. from the centre of the back lane to the staircase, they could continue erecting the class of houses most required by the people of South Shields. An effort will be made, I understand, to amend the by-law, so that the 20 ft. lateral space should be taken as from the centre of the back street, for there is no building estate in South Shields laid out in accordance with this provision of the by-laws. The crisis is having a serious effect upon the labour market in the town, and building operations have come to almost a standstill.— "ELFIN," in the *Newcastle Chronicle.*

BOW CHURCH AND THE CENTRAL LONDON RAILWAY.—A claim for compensation for damage to Bow Church, Cheapside, done and apprehended from the construction of the Central London Railway came before the Common Serjeant and a special jury at Guildhall a few days ago. The jury having adjourned to view the church, it was announced on their return that the case had been settled for 1,000*l.* and costs.

THE NATIONAL MEMORIAL TO QUEEN VICTORIA. —The following letter has been received from Lord Esher :—

H.M. Office of Works, Storey's Gate,
Westminster, S.W., July 12, 1901.
Queen Victoria Memorial.

DEAR SIRS,—In further reply to your letter of May 7 last, forwarding the resolution passed at a special general meeting of the Royal Institute of

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British Architects, I now have the honour to inform you that in accordance with the desire of the meeting this resolution has been laid before the Executive Committee appointed by H.M. the King. I am instructed to say that the Committee see no reason to depart from their original decision, taken after careful and due deliberation.—I have the honour to remain your obedient servant, ESHER.

The Secretaries,
Royal Institute of British Architects.

The resolution referred to, which urged upon the Executive Committee the desirability of inviting designs for the memorial from all British architects in open competition, was passed on April 20 at a special general meeting convened on the requisition of twelve subscribing members.—*Journal* of the R.I.B.A.

WHITE STONE LIME.—We have tested a sample of lime sent to us by Messrs. C. E. Hillman & Co., of Tunbridge Wells. It is a remarkably pure calcium oxide, there being but few traces of siliceous spicules or foreign matter present. It "slacks" vigorously, rapidly disintegrating, and the lumps break up quickly, enabling the sand as used for mortar to be readily incorporated. Practically none of the sample sent has proved to be inert. This lime, in mortar, sets firmly and hard. An experiment shows that two stock bricks joined together by this lime made into mortar with sharp builders' sand, and placed in the open for five weeks, could with difficulty be broken apart by repeated blows with a hammer. Some of the mortar still adhered to the bricks, and portions of the bricks themselves were broken, coming away with some mortar. Our opinion is that this is a first-class lime.

ST. MARY WOOLNOTH.—We should have mentioned that the measured drawings of this church by Mr. A. C. Bossom, published in our issue of July 20, gained for their author the Royal Academy first silver medal and books prize for measured drawings in December of last year.

BATTERSEA POLYTECHNIC INSTITUTION.—The Battersea Polytechnic are intending to extend their day technical courses for next session (commencing in September), to include a course suitable for lads entering the offices of architects, quantity surveyors, sanitary and municipal engineers. The course will be arranged to extend over two years, and will include the subjects required for the preliminary examination of the Royal Institute of British Architects, in addition to instructions in more distinctly technical subjects and workshop practice. The course will be intended for boys proposing to take the more professional and higher parts of the work as distinct from the existing artisan courses in building, which are intended to give lads some technical and practical training before entering builders' workshops.

CAPITAL AND LABOUR.

BRICKLAYERS' STRIKE, HARTLEPOOLS. — The bricklayers' strike at the Hartlepools, which has lasted twelve weeks, was settled on the 24th ult., at a meeting of the Teesside Master Builders' Association and the men. The men asked for a penny per hour advance, and have accepted a halfpenny, upon concessions in regard to rules being made on both sides.

LEGAL.

ACTION BY A CARPENTER AND BRICKLAYER FOR PERSONAL INJURIES.

THE case of Holman *v.* Moore & Son came before Mr. Justice Kennedy and a special jury in the King's Bench Division on the 25th ult., an action brought by the plaintiff, George Holman, a carpenter and bricklayer, residing at Addlestone, against the defendants, Messrs. Moore & Sons, millers, of Addlestone, for compensation for personal injuries sustained through the negligent driving of a carman in the defendant's employ. The defendants admitted liability, and the only question for the jury was what amount of damages the plaintiff was entitled to.

It seemed that on September 28 last the plaintiff was returning home from work in the evening when the defendants' two-horse van, in order to get in front of another van, was driven on to the footpath, with the result that the plaintiff was forced against some railings and thrown down, one of the wheels passing over him and severely bruising and injuring him. The plaintiff had to keep to his bed for six weeks, and for several more weeks was unable to follow his occupation. The medical evidence was to the effect that the injury the plaintiff had suffered might be permanent.

In the result the jury awarded the plaintiff 140*l.* damages.

Judgment accordingly.

HEAVY CLAIM FOR DAMAGES AGAINST THE BRADFORD CORPORATION.

MR. JUSTICE JOYCE, in the Chancery Division on the 29th ult., concluded the hearing of the case of Ambler & Sons, Limited, *v.* the Bradford Corporation, an action in which the plaintiffs claimed an injunction restraining the defendants from obstructing the flow of water in the Bradford Beck and from allowing out and in sluice-gates already erected by the defendants across the Beck to remain. The plaintiffs also claimed 33,794*l.* for damage caused to their premises on July 12, 1900, by the obstruction of the Beck on the part of the defendants. The defendants, by their defence, alleged contributory obstruction on the part of the plaintiffs by placing pipes across the Beck where covered by their buildings, and they further denied obstruction of the kind complained of, and set up that the damage caused was the result of *vis major*.

Sir Edward Clarke, K.C., Mr. Hughes, K.C., and Mr. Kenyon Parker, appeared for the plaintiffs; and Sir R. T. Reid, K.C., Mr. E. Tindal Atkinson, K.C., Mr. Younger, K.C., and Mr. Waugh for the defendant Corporation.

It appeared from the opening statement of Sir Edward Clarke that the question to be determined was whether the damage done to the plaintiffs' premises in July of last year was caused by the interference by the defendants with the Bradford Beck which passed under the plaintiff's works and which, at the end of the year 1899, was as the plaintiff's alleged obstructed by the defendants in the erection of sluice gates across the Beck. The Bradford Beck rose at Thornton, came through the City-receiving tributaries on the way and eventually ran into the river Aire. In the year 1804 the plaintiffs purchased a piece of land of about 4,600 square yards in area which was occupied by an old warehouse, and the purchase carried with it the ownership of half the Beck. In 1869, upon a portion of the purchase, a mill was erected. In the year 1875 the plaintiffs purchased 3,898 square yards of land to the north of the previous purchase. The purchases were on both sides of the Beck and therefore included the Beck, and in 1876 buildings were erected over the Beck and the plans of these buildings were lodged with the Corporation. Mr. Ambler, the head of the plaintiff firm, was then Chairman of the Bradford Corporation. The plans were passed and the buildings were erected. In 1885 the plaintiffs purchased another 16,300 square yards of land and a strip that ran along the middle of the Beck, and so they became possessed of the whole of the Beck; and immediately after that purchase a building called the new warehouse was erected. In 1888 there were some exchanges of land between the defendants and the plaintiffs in a matter of arranging frontages. Before the end of the year 1890 the plaintiffs had placed across the Beck certain pipes for the purposes of their business, which was that of mohair and worsted spinners, and the defendants' case was that this formed an obstruction of the Beck, and reduced the sectional area of the Beck as it passed under the plaintiff's premises. In the year 1895 the defendants gave notice to the plaintiffs to remove those pipes, but that notice was not complied with, the plaintiffs claiming to put the pipes there. In the year 1899 the defendants, at a distance of about 210 yards below the plaintiff's premises, put across the Beck certain sluices—about 24 ft. below Lionel-street Bridge. These works were put in by the defendants in connection with electric lighting works which they were authorised to carry out by Act of Parliament. There was one sluice put across the Beck and two at the side close by the two sluices at the side supplying water to ponds in connection with Corporation works. On July 12, 1900, during a thunderstorm, the Beck, in which there was usually from 6 in. to 12 in. of water, was flooded. The water rose very rapidly. It rose over the top of Lionel-street Bridge, and flooded over the top of the sluice to the extent of 2 ft. The sluices held up the planks and pieces of wood which came down the Beck and the place was blocked. The water was thus headed back to the plaintiff's premises and did damage to the extent of 33,000*l.*

Mr. R. E. Middleton, C.E., of Westminster, gave evidence for the plaintiffs to the effect that if the water had been going down the Beck on July 12, 1900, at the level it would have gone down had there been no sluices, the water would not have risen to the height of the pipes crossing the Beck beneath the plaintiff's premises.

Other evidence having been given.

Sir Robert Reid, for the defendants, asked the learned Judge to hold that the damage to the plaintiff's property was in no way the result of any action of the sluices.

Evidence having been given on behalf of the defendants by Mr. J. H. Cox, M.Inst.C.E., the City Surveyor of Bradford, and other witnesses, his lordship reserved judgment.

FIREPROOF CONSTRUCTION.

AT Southwark police-court on Saturday last, before Mr. Paul Taylor, a long-standing dispute as to the rebuilding of the Horseshoe beer-house, Old Kent-road, was finally settled.

Mr. Andrews appeared for the London County Council and Mr. Percy Gates was for the defendants, Mr. Hoskins, a builder, and the New Westminster Brewery Company, the owners of the premises.

Mr. Andrews stated that there was an appeal to Mr. Kennedy, some time ago, under Section 150 of the London Building Act, against a notice of objection, which had been served by the District Surveyor, Mr. Dicksee, at the request of the London County Council, to the rebuilding of the Horseshoe beerhouse without fireproof separation between the lower part, which was to be used for trade, and the upper part, which was to be used as a dwelling. Mr. Kennedy allowed the appeal of the builder against the notice of objection, but agreed to state a case. In stating the case Mr. Kennedy found as a fact that the lower part of the premises was to be used for trade and the upper part for habitation. The Divisional Court comprising the Lord Chief Justice and Mr. Justice Lawrance, dismissed the appeal of the London County Council on the case stated, and the Council then took the matter to the Court of Appeal. The Court of Appeal held that as the magistrate had found as a fact that the lower part was to be used for trade purposes and the upper part as a dwelling-house, they were bound by that finding, and they therefore allowed the appeal of the Council. At the same time they intimated that if it had been open to them to find the facts they would have found them differently. In the meantime the district surveyor served a notice of irregularity on the builder, under Section 161, and had the decision of the Court of Appeal been entirely in the Council's favour on the merits, they would have been entitled to require compliance with the regulations as to fireproof separation. The notice was not complied with, and a summons was obtained so as to be within the statutory period of six months, but it was adjourned pending the result of the appeal. The appeal having now been decided, he (Mr. Andrews) was instructed to say that as the building was erected on the faith of Carritt *v.* Godson, which decided that fireproof separation did not apply to public-houses, the Council did not feel justified now in proceeding any further on that summons, and he therefore asked leave to withdraw it accordingly.

The Magistrate: Very well, let it be marked withdrawn.

The summons was then marked withdrawn.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

6,085.—AUTOMATIC SPRINKLERS, ALARMS, &C.: *F. Grinnell.*—The object of the invention is to sound an alarm when the sprinklers are at work, but to prevent the alarm from being sounded by fluctuations in the supply pipe. Water is admitted through a valve (when lifted) in the supply pipe into another pipe, which is in communication with a container, whence a pipe extends to a diaphragm chamber so as to complete a circuit which will sound an electrical or other alarm, or the water may be caused to work a water-motor. In the case of a fluctuating flow of water through the valve in the supply pipe it will escape through an outlet, but when the working of the sprinklers will induce a continuous flow, the differential accumulation in the container operates a diaphragm which is joined with springs to a valve that hastens the sounding of the alarm and shuts the outlet. Various other modifications of the apparatus are specified.

6,098.—A LAVATORY BASIN: *M. J. Adams.*—A basin, rectangular on plan, is fastened with lugs to be built into the wall. The overflow is put on one side; on the other side is the inlet. The discharge pipe has apertures for purposes of cleaning, and for an overflow a hollow xylonite plug is adopted.

6,131.—METAL PLATES FOR BUILDERS' USE: *Count von Geldern-Egmond zu Arcen and Baroness I. von Lipowska.*—To render the plate stiff in any direction its sides are bulged outwards; the bulges may have various cross sections, and are disposed, if desired, in symmetrical patterns.

6,142.—A CIRCULAR-SAW GUARD: *C. T. Burgess and W. B. Burgess.*—The guard is supported by a bar which is set parallel to the shaft of the saw and is held up with a bracket fixed at the back of the bench and with an arm secured to the fence; upon the bar are pivoted a plate (made in two parts) which serves as a shield for the back of the saw and also a casting, in the guide way of which a front shielding plate is adjustably mounted; to the latter plate, and also to sustaining links, are pivoted other plates, which shield the sides of the saw. By another arrangement the plate which shields the back of the saw is rendered applicable for differently sized saws by being mounted upon a pivot on the casting and being clamped with a slotted stay.

6,188.—CONDUITS FOR CONDUCTORS (ELECTRICAL): *F. B. Boutillier and W. B. Hunter.*—Metal tubes have a lining of asbestos, which is fitted in a spiral shape by being rolled upon a rather smaller mandrel that is turned so as to expand the spiral in position, where it may be secured with cement, inside the tube.

6,189.—A PIPE-WRENCH: *O. Otteson.*—A grip is provided by means of a fixed jaw upon the handle of the wrench and a movable jaw upon a stem pivoted to a piece and forced with a spring towards the fixed jaw. The head of a screw which adjusts the piece upon the handle will engage with a notch in the handle and its middle pin will enter a hole under the fixed jaw.

6,200.—SPIGOT AND SOCKET PIPE-JOINTS: *A. A. Knudson.*—The joints and electrical bonds of street pipes and mains are devised to obviate the shunting of currents around the joints. In the case of a leaded spigot-and-socket joint a leaden packing

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encloses the metal contacts which are separated from the jute packing, whilst each of them has a circular metal, or a coiled wire, washer. For the rivet contact may be substituted a screwed plug having a wire washer, or a single piece retained with a channel pin, or a metal plug only.

6,222.—Apparatus for Lifts and Hoists: *Pedrick & Ayer Co.*—Air is supplied under pressure to the opposite ends of a pneumatical cylinder, and a three-way cock is inserted in a pipe that joins the ends of the cylinder; if the cylinder ends are opened to one another and at the same time closed to exhaust, the piston will descend by reason of the greater pressure exerted upon the greater upper surface; in the case of the premature descent of the load (if air should leak past the cylinder) the end of a lever which is fastened on to a friction collar will lift and open a relief valve.

6,234.—Water Supply for Domestic Purposes: *W. McCallum, J. Blakney, and C. R. Bartlett.*—The inventors provide means whereby the turning on of any hot-water tap shall light the heater and so afford a supply of hot water. A valve in a chamber of the gas-supply pipe prevents—under normal conditions—the gas from flowing to the discharge nozzle, mixer, and burner, its position being controlled by that of a leaky piston within the water chamber, which is connected with the water-supply pipe, whilst a tube conveys the water from the chamber around the heater coils to the hot-water taps, the piston and valve being rigidly connected with a rod inserted through a flexible diaphragm. When a hot-water tap is opened the pressure upon one side of the piston becomes lessened, whilst the pressure upon the other side presses back the piston and valve so as to open the gas supply, a by-pass from the chamber igniting the gas.

6,238.—Manufacture of White Cement: *Terranova Industrie, C. A. Kapferer & W. Schleuning.*—As a modification of the process specified in No. 17,853 of 1899, and in substitution of natural feldspar, are employed certain equivalent non-ferruginous artificial elements, composed of acid silicates frittings and glass, of alkalies or alkaline earths, with silica and clay.

6242 and 6324-5.—Apparatus for Automatically Locking the Well-doors of Lifts: *J. C. Etchells.*—A weight that slides upon a rod closes from left to right a gate, after the "Bostwick" kind, and the gate is then locked with a spring which keeps in place pivoted bell-crank levers that are linked together. As the cage reaches the floor the lower ends of the levers are moved by a striker attached to the cage, and a spring-nose upon one of the levers is lowered for the unlocking of the gate. A catch keeps the opened gate in position, and as the cage is moved away the catch falls, whereupon the gate is shut, and a spring-nose upon the other lever locks it again. 6,324.—For a vertically sliding door a lever having hinged spring-noses is pivoted in a casing at the side of the door, the lower end being pressed inwards with a spring for locking the closed door. With the arrival of the cage one of the noses becomes disengaged through the forcing upwards of a lever, whilst the other nose is forced forwards into engagement with the raised door. 6,325.—For well doors after the portcullis kind, the doors, each of which has an angle-iron frame, slide in continuous angle-iron guides in the shaft, and are joined with ropes so that the lower one descends as the upper one ascends. The upper door will overbalance the lower one, and the doors are therefore self-supporting.

6,251.—Metal Tie-bars: *E. Schild and F. Lorey.*—For fastening beams to one another or to walls are devised slotted tie-bands or strips of metal, which may have their ends split or turned outwards at a right angle, the slots being sufficiently large to take cross-dowels (in the case of stonework) or slotted anchoring-bars, and bolts or cramps fasten the bars to the beams or woodwork. The contrivance is described as being applicable also for use with stone blocks, trussed girders, arches, temporary buildings, and so on.

6,255.—A Window Fastening: *J. R. Charlesworth.*—To the top meeting-rail of the lower sash is secured a sleeve in which will slide a bolt or catch of which the nose engages with a set of recesses cut in a rack-plate upon a side rail of the upper sash; the bolt is normally held in its working position with a spring, and has a knob for its handle.

6,295.—A Ventilator: *W. E. Aldous and F. D. Aldous.*—The ventilator, which is intended for houses, churches, factories, schools, sewers, and other structures, has openings for the entrance of fresh air in its upper part and a central passage down which the air flows for escape through a divided cone to an annular space within the shaft. The fresh and vitiated currents of air become mingled in the space, and the vitiated air ascends through passages at the side of the shaft to escape beneath the hood or screen at the top of the shaft. Inlets are provided that will draw impure air to the ventilator from remoter portions of the building.

6,318.—The Construction of Roofs: *C. Loehle.*—The inventor seeks means of discarding the use of intermediate internal columns and girders. He constructs each plane section of the roof framework of timber, concrete, or iron, strutted and braced as a girder so that it shall be self-supporting. The steep sides of the roof are glazed and may have pivoted windows. For a sector-shaped or circular roof he strengthens the slopes with radial concrete beams or struts and curved horizontal iron bars, and fits the steep side with windows inside the line of pressure of the concaved structure.

6,331.—An Appliance for Fire-escapes: *H. W. Racey.*—The lowering apparatus is provided with a brake that will control the rate of its descent. The suspending rope acts as an automatical brake upon pulleys through the weight of the person who is making his escape, which also presses a pulley, upon a radial arm, against the rope. A hand-wheel supplies additional brake-power.

6,338.—The Moulding of Building-slabs, Blocks, Panels, &c.: *E. E. von Hedemann and R. von Hedemann.*—For the manufacture of slabs, panels, blocks of plaster of Paris or concrete, and so on, is devised an apparatus consisting of a cruciform mould, in four sections, which is mounted upon a base-plate, the size of the cast slabs being altered at will by the insertion of loose end-pieces into the sections. Vertical iron plates moved with screwed shafts constitute the mould, in the centre of which is a base-plate carrying a tubular core; for casting separate slabs a four-sided core is placed around it; for casting chimney-tops and similar goods an annular mould is made, with two concentrical tubes in the middle portion of the mould; and in the case of corner blocks the aperture made by the tubular core will afford space for carrying an iron strengthening-bar through the block.

6,343.—A Chimney-top and Cowl: *W. Pollard, J. T. Pollard, and J. T. Pollard.*—Over the mouth of an up-take pipe is fitted a headpiece, which has side openings and is carried upon ball bearings on a bracket that will serve for air inlets. On to the bracket is cemented a bevelled channel-ring, which forms a ball-race. In the socket of the headpiece overlapping the brackets is cemented another bevelled channel-ring. An oblique rod set in a screw-clamp carries a vane, and the settlement of soot upon the bearings is obviated by means of a flange inside the headpiece.

6,375.—An Anti-Fouling Composition: *R. Kopp.*—For coating metallic structures is prepared a film of coal oil, to which is applied without delay an anti-corrosive paint made up of equal parts of red lead, French zinc (oxide of zinc), and Portland cement mixed with oil and a dryer. For marine purposes arsenic is added to the paint, after which is applied an anti-barnacle coating compounded of equal parts of red lead, verdigris, zinc dust, French zinc, with oil and a dryer.

MEETINGS.

Wednesday, August 7.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 15.—By R. & J. R. Mitchell (at Cockermouth).

Brigham, Cumberland—Enclosures of land, 34 a. o r. 39 p., f.	£1,500
Four cottages and 0a. 1 r. 6 p., f.	300
Enclosures of land, 31 a. o r. 9 p., f.	1,100
Mosser, Cumberland.—Bramley Farm, 139 a. o r. 10 p.; also allotments. 265 a. 1 r. 37 p., f.	3,000

July 18.—By S. & G. Kingston (at Holbeach).

Holbeach, Lincs.—Various enclosures, 65 a. 2 r. 23 p., f.	2,725
Whaplode, Lincs.—Enclosures of land, 23 a. 1 r. 30 p., f.	1,430

July 19.—By E. & S. Smith.

Walthamstow.—2, 4, 6, and 8, Edinburgh-rd., f.	1,050

By A. J. Sheffield.

Upper East Smithfield.—No. 15, e r. 55*l.*	475
East Ham.—3 to 13 (odd), Macaulay-rd., f., r. 143*l.*	1,575
Pimlico.—5, Charlwood-rd., u.t. 22½ yrs., g.r. 6*l.*, r. 50*l.*	300
Bow.—151 to 159 (odd), Devon's-rd., u.t. 70 yrs., g.r. 15*l.*	980

July 20.—By T. W. Gaze & Son (at Norwich).

Morley St. Peter, Norfolk.—The Old Hall Farm, 166 a. 2 r. 16 p., f. and c.	2,000
A freehold farmhouse and 137 a. 2 r. 30 p.	1,825

By G. Durrant & Sons (at Norwich).

Mundham, Norfolk.—Mundham Mill and 27 a. 1 r. 5 p., f. and c.	500
Freehold house and 1 a. 2 r. 20 p.	155

By P. M. Puckridge (at Oxford).

Clanfield, Oxon.—Windmill Farm, 123 a. 2 r. 32 p., f.	2,400

By Harman Bros. (on the Estate).

Telscombe Cliffs, Sussex.—Ambleside-av., &c., 96 plots of building land, f. (in lots)	3,181

July 22.—By Beale & Capps.

Hampstead.—116, Adelaide-rd., u.t. 47 yrs., g r. 4*l.*, r. 65*l.*	630
Notting Hill.—64 and 66, Cambridge-gdns., u.t. 62½ yrs., g.r. 16*l.*, r. 180*l.*	1,450

By Brackett & Sons.

Tottenham Court-rd.—16, Alfred-pl., u.t. 33 yrs., g r. 8*l.* 16s. 6d., r. 80*l.*	200
Covent Garden.—Floral-st., f.g.r. 10*l.*, reversion in 28 yrs.	460
Piccadilly.—No. 167, a profit rental of 100*l.* for 4¾ yrs.	160

By Chetwynd, Lloyd, & Dean.

Kensington.—1a, Berkeley-gdns., f., r. 60*l.*	£700

By Messrs. Kemsley.

Navestock, Essex.—Yew Tree Farm, 68 a. o r. 7 p., f. and c.	1,525
Little Dunmow, Essex.—Rose Farm, 33 acres, f.	240
Enclosures of land. 25 a. 2 r. 9 p., f.	540

By King & Chasemore.

Thakeham, Sussex.—Two enclosures of land, 5 a. 1 r. 18 p., f.	100
Part of Greenhurst Farm, 27 a., f.	500
Duke's Rough Woodland, 10 a. 3 r. o p., f.	500
A freehold cottage and 2 a. o r. 7 p.	150
East and West Common Fields, 15 a. 1 r. 20 p., f.	410
Enclosures of market garden ground, 3 a. 3 r. 5 p., f.	220
Wagner's and 1 a. 1 r. 21 p, f.	140
Stream Farm. 21 a 3 r. 14 p., f.	180
Pulborough, Sussex.—Little Brindsbury Farm, 64 a., f.	600

By Matthews, Matthews, & Goodman.

Kentish Town.—48, Shirlock-rd., u.t. 67 yrs., g.r. 8*l.* 15s., r. 50*l.*	600

By Reynolds & Eason.

Oxford-st.—3 to 9, South Molton-st., area 5,200 ft., building lease for 80 yrs., let at per annum	760
13, South Molton-st., area 960 ft., building lease for 80 yrs., let at per annum	140

By Wagstaff & Sons.

Stoke Newington.—44, Farleigh-rd., u.t. 63½ yrs., g.r. 7*l.*, e.r. 45*l.*	490

By Debenham, Tewson, & Co. (at Haslemere).

Chiddingfold, Surrey.—Three cottages and enclosures of land, 102 a. 2 r. 23 p., part f. and part u.t. 200 yrs.	2,000

By Castiglione & Gibbings (at Carlisle).

Tarraby, Cumberland.—Farmhouse and 62 a. 3 r. 35 p., f.	4,000
Two cottages and 17 a. o r. 4 p., f.	1,000
Two freehold fields, 12 a. 2 r. 20 p.	800
Houghton, Cumberland.—The Poplars and 38 a. 1 r. 20 p., f.	2,250
Cummersdale, Cumberland.—The Cummersdale Dye Works and 3 a. 2 r. 20 p., f.	1,700
Enclosures of grazing land, 37 a. 3 r. 2 p., f.	1,300

By J. R. Eve & Son (at Luton).

Flamstead, Herts.—Pepsal End and Bottom Farms, 172 a. 1 r. 25 p., f. and c.	3,350
A freehold field, 15 a. 1 r. 4 p.	400
A copyhold field, 3 a. 1 r. 13 p.	100

By W. Salisbury & Hamer (at Burnley).

Habergham Eaves, Lancs.—Copy Farm, 146 a. o r. 35 p., f.	2,540
Higher Small Hazels and Little London Farm, 70 a. 1 r. 1 p., f.	1,350
Brierfield, Lancs.—Kibble Bank Farm, 37 a. 1 r. 32 p., f.	1,350
Sage Hill Farm, 10 a. 1 r. 17 p., f.	515
Cliviger, Lancs. — Far Side Farm, 67 a. 3 r. 25 p. f.	3,000

By J. H. Bethell (at Forest Gate).

Manor Park.—Aldersbrook-rd., &c., 77 plots of building land, f. (in lots)	4,700

July 23.—By Allan Booth.

Gray's Inn-rd.—42, Acton-st., u.t. 46 yrs., g.r. 8*l.* e.r. 60*l.*	430

By Boreham & Co.

Streatham.—69 and 71, Natal-rd., u.t. 82 yrs., g.r. 10*l.* 10s.	475

By C. H. Brown.

Pimlico.—94, Gloucester-st., u.t. 32½ yrs., g.r. 10*l.* e.r. 75*l.*	595

By Debenham Tewson & Co.

Kilburn.—4, 6, 8, and 10, Quex-rd., f., r. 255*l.*	4,000

By Holliday & Stanger.

Bromley Common, Kent.—Napier-rd., a block of freehold stabling, e.r. 18*l.*	200

By Perkins & Cæsar.

Chelsea.—King's-rd., i.g.r.'s 131*l.*, u.t. 38½ yrs., g.r. 40*l.*	1,570
Royal-avenue, i.g.r.'s 28*l.*, u.t. 38½ yrs., g.r. 8*l.*	325
Cheltenham-ter., i.g.r.'s 89*l.*, u.t. 38½ yrs. g.r. 26*l.*	1,010

By Alfred Richards.

Palmer's Green.—Green Lanes, Avondale and 1 a. or. 27 p., f.	3,000
Green Lanes, a block of freehold building land	1,600
Enfield.—Essex-rd., Sherwood and Palmerston Villa, f., r. 82*l.*	1,470
Sydney-rd., Nidus Villas and St. Andrew's Villa, f., r. 80*l.*	1,250
Dalston.—19 to 25 (odd), Trafalgar-rd., u.t. 38 yrs., g.r. 12*l.*, r. 115*l.*	1,055

By Rogers, Chapman, & Thomas.

Hammersmith.—Upper Mall, River House, part C and part u.t. 17 yrs., g.r. 3*l.*	1,000
Pimlico.—22 to 28 (even), Clarendon-st., u.t. 32½ yrs., g.r. 32*l.*	1,600
Westminster.—41, Bessborough-gdns., u.t. 32½ yrs., g.r 9*l.*, r. 55*l.*	600

By Salter, Rex, & Co.

Kentish Town.—15, Leighton-cres., u.t. 56½ yrs., g.r. 8*l.*, e.r. 55*l.*	550

By J. F. Stonehewer.

Wandsworth.—90 and 92, East-hill, area 6,840 ft., f., r. 105*l.*	2,350
1 to 6, Alma-ter., u.t. 25½ yrs., g.r. 8*l.*	920
Battersea.—117 and 119, Bridge-rd., u.t. 25½ yrs., g.r. 8*l.*, r. 56*l.*	470

By Walton & Ler.

Staveley, Lancs.—Black Beck Hall Farm, 64 a. o r. 14 p., f.	2,000

By E. Fergusson & Taylor (at New Barnet).

New Barnet, Herts.—3 and 4, East Barnet-rd., u.t. 78 yrs., g.r. 14*l.*, r. 95*l.*	1,075
Station-rd., a freehold building site	235

By Matthew Miles (at Mason's Hall Tavern).

City of London.—Aldersgate-st., Castle and Falcon Hotel, u.t. 12 yrs., r. 1,100*l.*, with goodwill	2,000

July 24.—By C. Rawley Cross & Co.

Acton.—32 to 40, 46 to 50 (even), Colville-rd., with two building plots adjoining, f.	2,150
2, 4, and 6, Willcott-rd., u.t. 96½ yrs., g.r. 22*l.* 10s., r. 113*l.*	1,180

By Curtis & Henson.

Rodwell, Dorset.—Old Castle-rd., f.g.r.'s 58*l.*, reversions 978 and 979 yrs.	1,561
Bincleaves-rd., &c., f.g.r.'s 80*l.*, reversions in 981, 986, and 988 yrs.	2,184
Bincleaves-rd., f.g.r. 66*l.*, reversion in 988 yrs.	1,800

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By H. DONALDSON & SON

De Beauvoir Town.—2, Englefield-rd., u.t. 24½ yrs., g.r. 5*l.*, r. 32*l.* £230

By GUY EWING & CO.

Loxwood, Sussex.—Great and Little Heath Fields, 20 a. 1 r. 36 p., f. 600
Enclosures of land, 29 a. 1 r. 30 p., f. 475
A freehold cottage and orchards, 0 a. 3 r. 0 p. .. 300

By FAREBROTHER, ELLIS, & CO.

Dulwich.—465 and 467, Lordship-lane, area nearly 1 a., f. 2,800
107 and 109, Upland rd., u.t. 65½ yrs., g.r. 12*l.*, r. 58*l.* 560

By HERRING, SON, & DAW.

Streatham.—Palace-rd., Red House, u.t. 78 yrs., g.r. 94*l.* 10s. 1,750
Clapham.—Atkins-rd., Campden Lodge, u.t. 23 yrs., g.r. 12*l.* 12s. 315
Walworth.—44, Lorrimore-rd., u.t. 44 yrs., g.r. 5*l.*, r. 36*l.* 350
Peckham.—84, Coplestone-rd., u.t. 76 yrs., g.r. 6*l.*, r. 30*l.* 370

By MAY & PHILPOT.

Streatham.—74, Palace-rd., u.t. 90 yrs., g.r. 16'. 1,100

By MOSS & JAMESON.

City of London.—80 and 81, Lombard-st., u.t. 33¾ yrs., g.r. &c., 510*l.*, e.r. 2,760*l.* 17,000
Brixton.—16, Luxor-st., u.t. 64½ yrs., g.r. 7*l.*, e.r. 35*l.* 325

By R. TIDEY & SON.

Harrow, Middlesex.—3, 4, and 5, St. Ann's-pl., f. 550
De Beauvoir Town.—47, Stamford-rd., u.t. 17 yrs., g.r. 3*l.*, r. 35*l.* 205

By H. D. TILLY.

Epsom, Surrey.—Loop-rd., St. Briavels and 1 a. 0 r. 25 p., u.t. 64 yrs., g.r. 16*l.*, r. 140*l.* 2,150

By DOUGLAS YOUNG & CO.

Ball's Pond.—74 and 76, Ball's Pond-rd., u.t. 52 yrs., g.r. 20*l.*, r. 80*l.* 635
Hoxton.—5, South-st., u.t. 26 yrs.. g.r. 6*l.* 6s., r. 45*l.* 375
Ilford, Essex.—80, Thorold-rd., f., e.r. 32*l.* 440

By BODY & SON (at Ivybridge).

Ugborough, Devon.—Part of Whitmore Estate, 29 a. 3 r. 27 p., f. 2,625

By N. EASTON & SON (at Hull).

Cottingham, Yorks.—Cottingham Grange Estate, 82 a. 3 r. 29 p., f. and c. 12,000
Igglemire Farm, 39 a. 0 r. 11 p., f. 4,675
Various enclosures of land, 46 a. 3 r. 10 p., f. .. 3,910
Three houses and 29 a. 3 r. 7 p., f. 2,900
Market garden ground, 14 a. 1 r. 15 p., f. 1,400

By BELTON & SONS (at Horse Shoe Hotel).

Strand.—Buckingham-st., the Prince's Head p.-h., u.t. 18 yrs., r. 150*l.*, with goodwill. 4,400

By MESSRS. SPELMAN (at Yarmouth).

Acle, Norfolk.—A dealer's occupation, 7 a. 1 r. 13 p., f. 475

By ISAAC J. ROBINSON (at West Hartlepool).

Greatham, Durham.—Owton Fence House Estate, 213 a. 2 r. 27 p., f. 18,025

July 25.—By S. BRADFORD & CO.

Leicester-sq.—Nos. 10 to 15, also 1 and 2, Leicester-pl., comprising the Hotel de l'Europe and Grand Cafe, u.t. 77½ yrs., g.r. 1,300*l.* 34,000

By FAREBROTHER, ELLIS, & CO.

City of London.—37, Cornhill, area 752 ft., f., r. 1,000*l.* 40,800
7, Cheapside, area 500 ft., f., r. 525*l.* 13,000
Westminster.—25, Old Queen-st., area 900 ft., f., r. 197*l.* 2,500
Shenley, Herts.—Elliott's Farm, 74 a. 2 r. 3 p., f. 2,500
Enclosures of land, 11 a. 1 r. 29 p., f. 635
Arden Cottage and 3 a. 3 r. 16 p., f. 1,010
Six copyhold cottage tenements and 0 a. 3 r. 34 p., f. 400
London-rd., enclosures of land, 14 a. 0 r. 20 p., f. 800

By H. J. BLISS & SONS.

Caledonian-rd.—7, Sutterton-st. and 1 to 15, Sutterton-mews, u.t. 45½ yrs., g.r. 50*l.*, r. 390*l.* .. 2,045
Bloomsbury.—19, Torrington-sq., u.t. 22 yrs , g.r. 15*l.*, r. 90*l.* 650
Clapton.—183 and 185, Rushmore-rd., u.t. 78 yrs., g.r. 10*l.* 10s. 340
Woodford.—Malmesbury-rd., Hilldane and Charlton, u.t. 80 yrs., g.r. 10*l.*, r. 59*l.* 440
Walthamstow.—15, 17, and 19, South-grove, u.t. 78 yrs.. g.r. 9*l.* 15s. 380
Fleet-st.—10, Gough-sq., an improved rental of 30*l.* for 41½ yrs. 375
Hornsey.—17 and 19, Harringay-grove, u.t. 55 yrs., g.r. 8*l.*, r. 54*l.* 450

By DEBENHAM, TEWSON, & CO.

Eastchurch, Isle of Sheppey.—Swanley Farm, 287 a., f. 1,450
Trout's or Waterlane Farm, 97 a. 2 r. 22 p, f... 775
Berryfield and 9 a. 0 r. 38 p., f. 400
Chapel House and 0 a. 1 r. 14 p., f. 200
Medstead, Hants.—Roe Downs and 196 a. 2 r. 9 p. f., r. 130*l.* 1,750
The Boynes and 2 a. 0 r. 20 p., f., r. 32*l.* 700
South Down Farm, 135 a. 3 r. 24 p., f. 1,200
Lymington Farm, 58 a. 2 r. 28 p., f. 700

By H. W. HARDY.

Hounslow.—Hanworth-rd., Holly Lodge, f., r. 40*l.* 755
St. Stephen's-rd., a plot of land, f. 220
Chiswick.—424, High-rd. and 26, Essex-pl., f., r. 55*l.* 1,100

By C. C. & T. MOORE.

Poplar.—1, Perry's-close, u.t. 55½ yrs., g.r. 3*l.* 5s., e.r. 32*l.* 310
Commercial-rd. East.—54, Watney-st., f., r. 80*l.* .. 1,480

By NEWBON, EDWARDS, & SHEPHARD.

Kentish Town.—165, Queen's-cres., f., r. 32*l.* 500
168, 170, 172, and 174, Weedington-rd., f., r. 148*l.* 2,100
1, 2, and 3, Gillies-st., u.t. 53 yrs., g.r. 17*l.*, r. 108*l.* 1,250
Hampstead.—11 and 12, Crossfield-rd., u.t. 77 yrs., g.r. 10*l.*, r. 140*l.* 1,510
Notting Hill.—2 and 4, St. Katherine's-rd., u.t. 57 yrs., g.r. 5*l.* 575
97 and 99, Prince's-rd., u.t. 57 yrs., g.r. 12*l.*, r. 72*l.* 575
Barnsbury.—21, Richmond-cres., u.t. 49¾ yrs., g.r. 8*l.*, r. 52*l.* 10s. 550
Holloway.—2, 4, and 6, Crayford-rd., u.t. 51 yrs., g.r. 15*l.*, r. 120*l.* 1,255
18 and 20, Dalmeny-av., u.t. 18¼ yrs., g.r. 21*l.*, r. 100*l.* 700
3, Mercers-ter., also Clarence Cottage, u.t. 22½ yrs., g.r. 15*l.*, r. 64*l.* £300
1 to 5, Thomas-st., u.t. 22½ yrs., g.r. 15*l.*, r. 122*l.* 640
Islington.—44, Park-st., f., r. 70*l.* 1,705
Clapton.—31 to 37 (odd), Mandeville-st., f., r. 104*l.* 1,200
45, Chatsworth-rd., u.t. 75½ yrs , g.r. 8*l.*, r. 42*l.* 370

By WM. STEVENS.

Kingsland.—38, Enfield-rd., u.t. 23 yrs., g.r. 4*l.* 10s., r. 36*l.* 240
De Beauvoir Town.—54 to 60 (even), Buckingham-rd., u.t. 23 yrs., g.r. 19*l.*, r. 140*l.* 900
Barnsbury.—19, Matilda-st., u.t. 40 yrs., g.r. 2*l.*, r. 32*l.* 340

By STIMSON & SONS.

Hammersmith.—1 to 7, Argyll-pl., u.t. 69 yrs., g.r. 21*l.* 1,300
Penge.—7, Laurel-grove, f., e.r. 70*l.* 1,040
Oakfield-rd., f.g r. 15*l.*, reversion in 55 yrs. 410
Peckham.—Rye Hill Park, enclosure of land with buildings thereon, area 3 a., f., r. 18*l.* 365
Islington.—33, Cloudesley-st. and the Cloudesley Arms p.-h., u.t. 15½ yrs , g.r. 30*l.*, r. 145*l.* 8s. 700
Maida Vale.—178, Portsdown-rd., u.t. 75 yrs., g r. 8*l.* 10s., r. 60*l.* 600
Kentish Town.—51, Rhyl-st., u.t. 48 yrs., g.r. 6*l.*, r. 30*l.* 280
Harlesden.—7, Manor-villas, u.t. 69 yrs., g.r. 5*l.*, r. 35*l.* 345

By DANIEL WATNEY & SONS.

Folkestone, Kent.—Coolinge-lane, enclosure of garden and orchard ground, 0 a. 2 r. 9 p., f... 570
The Cheriton Brick and Tile Works, 22 a. 3 r. 23 p., f., r. 80*l.* 4,400
Enclosure of arable land adjoining, 3 a. 2 r., f... 500
Cherry Garden-lane, two cottages and 17 a. 0 r. 16 p., f. 8,350

By GREEN & SON (at Dover).

St. Margaret's Bay, Kent.—Main rd., a corner building site, area ¾ a., f. 650
Main-rd.—The Bungalow, f. 200

By WORSFOLD & HAYWARD (at Dover).

Dover, Kent.—9, Waterloo-cres., u.t. 22 yrs., g.r. 10*l.*, r. 110*l.* 825
Buckland, Kent.—Church Path, a freeland meadow 230

By PHILIP DAVIES (at Knighton).

Llanvihangel-Rhydithon, Radnor.—The Mountain Farm, 17 a., f. 403
Llangunllo, Radnor.—Green Hollow Farm, 35 a. 2 r. 7 p., f. 625
Llanbister, Radnor.—The Rhosgree Estate, 229 a. 3 r. 10 p., f. 3,600

July 26.—By ALDER & CO.

Streatham.—22, Westmell-rd., u.t. 78 yrs., g.r. 4*l.*, e.r. 50*l.* 445

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1 11 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 6	,,	at railway depôt.
Red Wire Cuts	1 14 6	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 4 6	,,	,, ,,
Do., Bullnose	4 9 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 2 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	18 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
plays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	8 0 0	,,	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	34 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	,, ,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od.		per ton at rly. dpt.

PRICES CURRENT (*Continued*).

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.	
Bath ,,	1 7	,,	,,
Farleigh Down Bath	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,,	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks	2 1½	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4½	,,	,,
Hard York in blocks	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt	
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 0½	,,	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.	
,, ,, ,, 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
,, ,, ,, 3-in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep.	
,, best seconds	10 15 0	,,	,,
16×8 best	6 8 6	,,	,,
20×10 best blue Portmadoc	10 18 0	,,	,,
16×8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green	11 8 6	,,	,,
16×8 ,, ,,	6 15 0	,,	,,
20×10 Permanent green	10 0 0	,,	,,
16×8 ,, ,,	5 18 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt.	
Hip and valley tiles	3 7	per doz.	
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	more than battens.
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 18 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	19 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	19 0 0	20 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 0 0	16 0 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 10 0	15 10 0
Second yellow deals, 3 in. by 11 in.	16 10 0	17 10 0
Do. 3 in. by 9 in.	15 0 0	16 0 0
Battens	12 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	11 10 0	12 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 13 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6

[See also next page.

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Additions, &c., to Hospital	Teignmouth U.D.C.	C. Jones, Surveyor, Town Hall, Teignmouth	Aug. 6
Five Cottages, Loughlinstown	Rathdown R.D.C.	H. Powell, Civil Engineer, Council Offices, Loughlinstown, Ireland	do.
Additions to Workhouse Infirmary	Belfast Guardians	Young & Mackenzie, Engineers, Belfast	do.
Sewerage Works, Wednesbury-street	Walsall Corporation	J. R. Cooper, Borough Offices, Walsall	do.
Street Works, &c., Dudley-street and others	Warrington Corporation	T. Longdin, Engineer, Town Hall, Warrington	do.
Lighting Works, &c., Marlborough-road	Wealdstone U.D.C.	F. Hill Parr, Civil Engineer, Council Offices, Wealdstone	do.
Tar Macadamising, Carlton-crescent, &c.	.....	W. B. G. Bennett, Engineer, Municipal Offices, Southampton	do.
Levelling, Bankfield, Liverpool	L. & Y. Railway Company	H. Shelmerdine, Architect, Hunt's Bank, Manchester	do.
*Additions to Public Library	Willesden District Council	O. Claude Robson, Public Offices, Dyne-road, Kilburn	do.
Extension of Engine Room, Hunter-place	Greenock Police Board	W. M. Nelson, Engineer, Electricity Works, Greenock	Aug. 7
Water Supply, Ardblain Estate, Blairgowrie	.....	Anderson & Co., Blairgowrie, N.B.	do.
Granite Road Metal (3,000 tons)	Tamworth R.D.C.	H. J. Clarson, Civil Engineer, 22, Church-street, Tamworth	do.
Additions to School	Normanton-on-Soar School Board	Barrowcliff & Allcock, Architects, Loughborough	do.
Offices, Stores, &c., West Hartlepool	North-Eastern Railway Company	W. Bell, Architect, York	do.
Stabling, &c., West Hartlepool	do.	do.	do.
Building Works, Windsor Hotel, Pontyclun	.....	James & Morgan, Architects, Charles-street Chambers, Cardiff	Aug. 8
School Hall, &c., Roundhay, Leeds	.....	W. H. Beevers, Architect, 26, Bond-street, Leeds	do.
Club Premises, Ynyshir	Baden Powell Conservative Club	A. O. Evans, Architect, Pontypridd	do.
Earthenware Pipe Sewers, Lowton	Pudsey Corporation	J. Jones, Surveyor, Church-lane, Pudsey	do.
*Repairs and Supply of Materials, South Aldershot	War Department	Commanding Royal Engineer, South Aldershot	Aug. 9
Clock Tower, &c.	Sale U.D.C.	A. G. McBeath, Architect, 2, Montague-road, Sale	do.
House, Marine-parade, Saltburn	.....	E. A. Whipham, Architect, Stockton-on-Tees	do.
Road Works, &c.	Omagh R.D.C.	W. Cathcart, Board Room, Workhouse, Omagh	do.
Alterations, &c., to Schools, Monmore Green	Wolverhampton School Board	T. H. Fleeming, Architect, 102, Darlington-street, Wolverhampton	do.
Reservoir, Filter Bed, &c.	Woolacombe Waterworks	T. Rees, Civil Engineer, Newport, Mon.	Aug. 10
Municipal Buildings	Musselburgh Town Council	Lyle & Constable, Architects, 3, Hill-street, Edinburgh	do.
Street Works, Heaton Street, Standish	.....	Heaton & Co., Architects, King-street, Wigan	do.
Paving Works, Back Hill Top-avenue, &c.	Leeds Corporation	City Engineer, Municipal Buildings, Leeds	do.
Street Improvement Works	Stockton-on-Tees Corporation	M. H. Sykes, Engineer, Town Hall, Stockton-on-Tees	do.
Sanitary Pipes	Bingley (Yorks) U.D.C.	H. Bottomley, Surveyor, Town Hall, Bingley	do.
Laying Water Pipes	Nottingham Corporation	Engineer, Water Department, Nottingham	Aug. 12
Stables, Shed, Shop, &c.	Hoylake U.D.C.	T. Foster, Engineer, Council Offices, Hoylake	do.
Bridge above the Pentre	Abergavenny R.D.C.	J. Gill, Surveyor, 4, Brecon-road, Abergavenny	do.
School	Benwell School Board	J. W. Thompson, Architect, 63, Gray-street, Newcastle-on-Tyne.	do.
Additions to Heriott Watt College	.....	J. Anderson, 20, York-place, Edinburgh	do.
Pipe Sewers, &c., Stanford-le-Hope, Essex	Orsett R.D.C.	R. F. Grantham, Civil Engineer, 23, Northumberland-avenue, W.C.	do.
Offices, Houses, &c., Seaham Harbour	Sunderland, &c., Water Company.	W. & T. R. Milburn, Architects, 20, Fawcett-street, Sunderland	do.
Public Library	Stirling Town Council	Lessels & Taylor, Architects, 7A, Young-street, Edinburgh	do.
Steel Gasholder Tank	Tyldesley, &c., U.D.C.	Engineer, Gas Works, Tyldesley	do.
Drainage Works at Workhouse	Rugby Guardians	T. W. Willard, Surveyor, Rugby	do.
Sewerage Works, &c.	Fenny Stratford U.D.C.	J. Chadwick, Civil Engineer, Bletchley	Aug. 13
*Outfall Sewer	Aberdeen Town Council	Burgh Surveyor, Town House, Aberdeen	do.
Superstructure, Royal College of Science, S. Kensington Road, The Decoy	Office of Works	A. Webb, Architect, 19, Queen Anne's Gate, S.W.	Aug. 14
School, Meyrick-street	Eastbourne Town Council	R. M. Gloyne, Civil Engineer, Town Hall, Eastbourne	Aug. 15
*Addition to Bakehouse, Bethnal Green	Pembroke School Board	G. Morgan & Son, Architects, 24, King-street, Carmarthen	Aug. 19
College Homes, Tooting	London County Council	Architect's Department, 19, Pall Mall East	Aug. 20
Erection of Dwellings, Rotherhithe	Wandsworth and Clapham Union	Cecil A. Sharp, Architect, 11, Old Queen-street, S.W.	Aug. 22
Electric Light Station, Charles-street	London County Council	Architect's Department, 18, Pall Mall East	Aug. 23
Electric Lighting, Lunatic Asylum, Warlingham	Nelson Corporation	B. Ball, Civil Engineer, Town Hall, Nelson	Aug. 24
*Swimming Bath and Lodge, &c.	County Borough of Croydon	Borough Engineer, Town Hall, Croydon	Aug. 26
Extensions of the Borough Asylum, Middlesbrough	County Borough of Reading	Borough Engineer, Town Hall, Reading	Aug. 29
Board School for 1,250 Children	Middlesbrough Corporation	The Clerk, Municipal Buildings, Middlesbrough	Sept. 2
Additions to Hospital, Bury St. Edmunds	Gillingham & Grange U.D. Sch. Bd.	H. D. Pearson, Architect, 27, Chancery-lane, W.C.	No date
Vicarage, Merthyr Cynog, Brecon	The Committee	H. P. Adams, Architect, 28, Woburn-place, W.C.	do.
Rebuilding the Golden Ball, Dalton	.....	G. Moxham, Architect, 39, Castle-street, Swansea	do.
Sewerage Works, &c., London-road	Messrs. R. & P. Hartley	Settle & Farmer, Architects, Dalton	do.
Additions to Eccles Hotel, Glengariff	Deal Parochial Schools Committee	W. Howitt, Parochial Schools, London-road, Deal	do.
Additions to Grammar School, Wallingford	.....	A. Hill, Architect, 22, George's-street, Cork	do.
Making Two new Streets, Churwell, near Leeds	.....	S. R. Stevenson, Architect, 12, Burns-street, Nottingham	do.
Enlargement St. Cuthberts Church, Thetford	.....	Mr. Powell, 4, King-street, Wakefield	do.
New Bridge over Thames at Whitchurch	The Committee	Arthur J. Lacey, 6, Upper King-street, Norwich	do.
	.....	J. Morris & Sons, 156, Friar-street, Reading	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Chief Assistant to Borough Surveyor	Cheltenham Corporation	200*l.*	Aug. 7
*Clerk of Works	Watford School Board	3*l.* 3*s.* per week	Aug. 8
*Surveyor	Bridgwater R.D.C.	225*l.* per annum	Aug. 17
*Inspector of Nuisances and Building Inspector	Maldens and Coombe U.D.C.	120*l.* per annum	Sept. 1
*Borough Surveyor	Fulham Borough Council	400*l.* per annum	Sept. 4
*Chief Engineer	London County Council	2,000*l.* per annum	Sept. 30

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xix. & xxi.*

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6

PRICES CURRENT (*Continued*).

WOOD.

	Per square. £ s. d.	£ s. d.
Prepared Flooring—		
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	8 0 0
Compound Girders ,, ,,	9 0 0	10 5 0
Angles, Tees and Channels, ordinary sections	8 17 6	10 17 6
Flitch Plates	9 0 0	9 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -

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PRICES CURRENT (*Continued*).

METALS.

	Per ton in London. £ s. d.	£ s. d.
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	15 5 0	- - -
Pipe in coils	15 15 0	- - -
Soil Pipe	18 5 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 0 0	- - -
Silesian	23 10 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 5	- - -
SOLDER—Plumbers' ,,	0 0 7	- - -
Tinmen's ,,	0 0 6	- - -
Blowpipe ,,	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 0	per ton delivered.
Fine ,,	38 0	,, ,,
Coarse Keenes and Parian cement	51 6	,, ,,
Fine do. do.	59 6	,, ,,
Robinson's Fireproof Cement	51 6	,, ,,
Do. Finishing ,,	56 6	,, ,,
(Exclusive of the ordinary charge for sacks.		
Whiting	30 0	,, ,,

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
,, ,, fourths	2½d.	,, ,,
21 oz. thirds	3½d.	,, ,,
,, ,, fourths	3½d.	,, ,,
26 oz. thirds	5d.	,, ,,
,, ,, fourths	4½d.	,, ,,
32 oz. thirds	6d.	,, ,,
,, ,, fourths	5½d.	,, ,,
Fluted sheet, 15 oz.	3½d.	,, ,,
,, ,, 21 ,,	4½d.	,, ,,
½ Hartley's Rolled Plate	3d.	,, ,,
⅝ ,, ,, ,,	3½d.	,, ,,
¾ ,, ,,	4d.	,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 10
,, ,, ,, in barrels ,,	0 2 11
,, ,, ,, in drums ,,	0 3 1
Boiled ,, ,, in pipes ,,	0 3 0
,, ,, ,, in barrels ,,	0 3 1
,, ,, ,, in drums ,,	0 3 3
Turpentine, in barrels ,,	0 2 4
,, in drums ,,	0 2 6
Genuine Ground English White Lead per ton	23 0 0
Red Lead, Dry ,,	23 10 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

W. S.—J. S. M. (Amounts should have been stated). J. B. R. (Below our limit). C. G. B. (Next week).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

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We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ADDLESTONE.—For the erection of a new school to accommodate 300 boys for the Addlestone School Extension Committee. Mr. Horace C. Fread, architect, Molesey, S.W.:—

J. W. Young	£2,870 0	W. H. Gaze & Sons	2,048 0
W. G. Tarrant	2,339 0	W. Greenfield, Weybridge*	2,033 15
Higby & Rabson	2,311 7	Willis & Dickinson	1,989 0
R. Atkinson	2,167 10		
W. H. Taylor	2,134 10		
E. Chamberlain	2,134 0		
C. Horsell	2,050 0		

BARKING (Essex).—For the erection of entrance lodge, tool-house, &c., at the recreation ground, Longbridge-road, for the Urban District Council. Mr. C. F. Dawson, Surveyor, Public Offices, Barking:—

Thomas & Edge	£1,370	J. & H. Cocks	£1,254

[Surveyor's estimate, £1,128 18s. 11d.]

BERKHAMSTEAD.—For alterations and additions to the Bull for Benskin's Watford Brewery, Limited. Mr. Percival C. Blow, architect, St. Albans and Harpenden:—

J. Smith	£302 15	A. P. Tomlin, Boxmoor*	168 10
H. & J. Matthews	188 0		

BLACKBURN.—For extensions to electricity works. Jubilee-street for the Corporation. Mess s Lacey, Clirehugh & Sillar (consulting engineers). Mr. A. S. Giles, engineer, Jubilee-street, Blackburn:—

John Knowles	£16,550 0 0	Highton & Son	£15,700 0 0
S. & J. Whitehead	16 300 0 0	J. Cronshaw	15,600 0 0
Wilson & Sons	16,186 0 0	Higson & Sons	15,350 0 0
Marshall & Dent	16,155 10 0	Whittaker & Sons	15,084 0 0
Lewis & Sons	16,060 0 0	John Boland	14,910 0 0
Keeley & Son	16,017 0 0	W. J. Woof Cronshaw*	14,884 0 0
Daniel Smith	15,831 6 0		
R. Sborrock	15,800 0 0		
Fecitt & Sons	15,775 0 0		

BURSLEM.—For the erection of a cottage, Edgefields estate, Stockton-Brook, for Mr. Wm. Heath. Mr. W. H. Walley, architect, Queen-street, Burslem. Quantities by architect:—

C. Frost	£790	J. H. Ford	£695
Beech & Adkins	760	J. Cooke	640
W. Howe	726		

COVENTRY.—For additions, &c., to Park Fields, Allesley, for Mr. J. Mayfield. Mr. F. Foster, architect, Hertford-street, Coventry. Quantities by architect:—

J. Worwood	£1,767 0 0	C. Garlick	£1,465 0 0
C. Haywood	1,750 0 0	A. Beacham	1,405 12 9
C. Hope	1,642 0 0	V. A. Pearson, Earlsdon, Coventry*	1,326 0 0
Harper & Son	1,617 0 0		
C. Gray Hill	1,600 0 0		

DOVER.—For supplying and laying water-mains, Glenfield-road, &c., for the Town Council. Mr. H. E. Stilgoe, C.E., Town Hall, Dover:—

L. H. Green	£701 13 9	Biggs, Wall, & Co., London*	479 6 11
Geo. Munro	654 1 0		

EAST STONEHOUSE (Devon).—For the erection of lodge and lavatories, Victoria Park, for the Joint Committee of Plymouth, Devonport, and Stonehouse. Mr. A. W. Debnam, architect, Town Hall, East Stonehouse:—

Wakeham	£1,624 0 0	Blackell & Sons	£1,431 0 0
Turpin	1,613 0 0	Skinner	1,403 16 9
Goad	1,592 0 0	Truscott	1,396 0 0
May	1,530 0 0	Coles, Stonehouse*	1,386 0 0
Stevenson	1,520 0 0	Northcott (withdrawn)	1,249 0 0
Blake	1,502 0 0		

GILLINGHAM (Kent).—For the supply of Cherbourg quartzite, Kentish ragstone, &c. (1,000 tons granite, 100 yards ragstone), for the Urban District Council of Gillingham (Kent). Mr. C. Candler, Surveyor:—

	Per Ton.	
S. Burford	11 4	Cherbourg granite.
L. Sommerfeld	11 4	
Road Maintenance Co.	11 2	
Quartzite Granite Co., Marklane, London*	11 0	
Whitwick Granite Co.	15 2	Whitwick granite.
Dickson & East*	11 6	Trusham granite.
Goldsmith, Ltd.	7 6	Kentish ragstone.
Chittenden & Simmons	7 0	
Bensted & Son	6 9	
L. Sommerfeld	9 3	Devonshire ragstone.

GLOUCESTER.—For the erection of four cottages, &c., at the docks, for Messrs. G. and W. E. Downing. Mr. W. B. Wood, architect, 12, Queen-street, Gloucester:—

John Leat	£2,556 5 11	Freeman & Jones	£2,266 0 0
King & Son	2,478 0 0	Gurney Bros.	2,203 0 0
W. Byard	2,410 0 0	A. J. Dolman	2,189 0 0
W. Jones	2,300 0 0		

HARPENDEN.—For the erection of a pair of villas, West Common, Harpenden, for Mr. C. B. Dobson. Mr. Percival C. Blow, architect, St. Albans and Harpenden:—

W. Sharpes	£1,675	Miskin & Sons	£1,130
E. Dunham	1,170	Phillips & Blake*	1,100

HASLEMERE (Surrey).—For alterations, &c., to the town hall, for the Parish Council. Mr. J. Howard, surveyor, Lower-street, Haslemere:—

J. W. Eele	£450 12 8	C. Bridger	£381 0 0
H. Hutchinson	420 0 0	H. Carpenter	380 0 0
Rt. Wood	414 0 0	F. T. Wonnacott	370 0 0

HASLEMERE.—For building two bacteria beds at the sewage works, for the Hambledon Rural District Council. Mr. J. H. Howard, surveyor, Lower-street, Haslemere:—

T. Wonnacott	£510	Streeter Bros.	£379
R. Wood	503	H. Hutchinson, Haslemere*	345
G. A. Frank	482		

HULL.—For the erection of two houses, Withernsea, for Rev. Robert Harrison, Wilberforce-street, Hull. Mr. T. Beecroft Atkinson, architect, 11, Trinity House-lane, Hull:—

Building.—W. H. Carr, Withernsea*	£610 0 0
Joinery.—J. Stephenson, jun., Hull*	256 0 0
Slating.—Mark Woodcock, Hull*	57 12 9
Christie Patent Stone Co., Hull*	64 10 0
Plumbing.—Walter Kirkwood, Withernsea*	137 7 0

LLANTARNAM.—For Board school for girls, Cwmtran, for the Llantarnam School Board. Messrs. B. Lawrence & Son, architects, Newport:—

Mainwaring Bros.	£4,455	Jenkins & Son, Newport*	£3,525
Leadbeter	3,893	Jas. Davies	3,421
Poulton & Whiting	3,785		

LONDON.—For erecting a factory, Woodfield-road, Paddington, for Messrs. Priddy & Hale, Limited. Mr. Percival C. Blow, architect, St. Albans and Harpenden. Quantities by Mr. H. Riley, Victoria Mansions, S.W.:—

		Months.
Lawrance & Sons	£8,554	9
Patman & Fotheringham	8,393	8
McCormick & Sons	7,900	10
Colls & Sons	7,642	7
G. Neal	7,669	6
Allen & Sons	7,665	—
Bywaters & Son*	7,524	6
Holliday & Greenwood	7,477	8

LONDON.—For the new police station, Lee-road:—

	Credit.	
C. Ansell	£25	£10,243
Groves & Son	20	10,219
Killby & Gayford	20	10,179
Lathey Bros.	30	10,149
Holloway Bros.	—	10,100
F. & H. F. Higgs	—	9,789
E. Knight	—	9,789
Higgs & Hill	15	9,694
Bush & Sons	—	9,639
C. E. Allen	25	9,465
Sharp, Patrick & Son	50	9,249

LONDON.—For additions to the Convent of Notre Dame, St. George's-road, Southwark. Mr. J. C. Radford, architect. Quantities by Mr. H. F Williams:—

Holloway Bros.	£10,577	H. Roffey	£9,472
Martin Wells & Co.	10,139	Gregory & Co.	9,365
Perry & Co.	10,089	Patman & Fotheringham	9,237
Colls & Sons	9,843	Marsland & Sons	9,212
Godson & Sons	9,800	T. Blackmore	8,598
Adamson & Sons	9,581	F. G. Minter†	8,595
Carmichael	9,494		

LONDON.—For decorative and sanitary repairs and electric-light installation, 38, Warwick-road, Earl's Court, S.W. Messrs. J. W. Morley & Co., surveyors, 185, Earl's Court-road, S.W.:—

Holdstock & Mould	£328 0	James Whitaker	£313 0
Rugg & Son	322 10		

PONTYPOOL.—For additions, &c., to intermediate school, for the managers. Messrs. B. Lawrence & Son, architects, Newport, Mon.:—

L. R. Lucas	£1,083	John Charles	£857
Morgan & Evans	1,055		

RUSHDEN (Northants).—For the erection of workshops, stores, &c., Newton-road, for the Urban District Council. Mr. W. B. Madin, C.E., Vestry Hall, Rushden. Quantities by surveyor:—

H. Sparrow	£910 0	R. Marriott	£847 0
Hacksley Bros.	890 0	T. Wilmott, Jr., Rushden*	799 10
C. E. Bayes	873 0		

ST. ALBANS.—For residence, Clarence, St. Albans. Mr. Percival C. Blow, architect, St. Albans and Harpenden:—

J. Hunt	£1,744	Phillips & Blake	£1,474
T. Turner, Ltd.	1,698	E. Dunham, St. Albans*	1,386
Miskin & Sons	1,580		

ST. ALBANS.—For the erection of villa, Selby-avenue, for Mr. Walter Lewis. Mr. Percival C. Blow, architect, St. Albans and Harpenden:—

W. Goolchild	£434	F. W. Stanley, St. Albans*	320
Hammond & Sons	395		
W. Sharp	360		

STEVENAGE (Herts).—For the supply of granite road metal, for the Urban District Council:—

	1½ in. to 2½ in. per ton. s. d.	1 in. to 1½ in. per ton. s. d.
Enderby & Stoney Stanton Co.	11 10	11 10
Griffiths & Co., Ltd.	16 10	16 10
Rowley Regis Co., Ltd.	14 6	14 6
Ellis & Everard, Ltd.	12 3	11 3
Mountsorrel Granite Co.	12 6	9 0
Van Praagh & Co., Ltd.	11 9	10 9
Watson & Co., Ltd.	13 0	12 0
H. L. Cooper	11 6	11 6
Whitwick Granite Co.	12 0	11 9
Walter Pearman, Stevenage*	11 9	11 9

[See also next page.

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LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect :—

Exterior Painting.

The exteriors of the following schools will be painted between September 28 and October 26, 1901 :—

BERNER-STREET :—

Johnson & Co.	£317 0	J. T. Robey	£263 10
Corfield & Co.	315 0	J. Haydon.....	254 0
Vigor & Co.	306 0	D. Gibb & Co.....	249 0
A. W. Derby.....	290 0	J. F. Holliday*....	235 0

BRECKNOCK :—

Balfour & Co...	£430 3 4	Stevens Bros. ..	£279 0 0
Wall & Co.	290 0 0	R. S. Buckeridge	210 0 0
Marchant & Hirst	282 0 0	Bristow & Eatwell*	195 0 0

BROMLEY HALL-ROAD :—

Vigor & Co.	£194 10	J. Haydon.....	£158 0
A. W. Derby.....	192 0	J. F. Holliday	154 10
D. Gibb & Co.	189 0	Corfield & Co.* ..	148 0
J. T. Robey	173 16		

CRAMPTON-STREET :—

Garrett & Son.....	£601	W. V. Goad	£473
Rice & Son	512	W. Downs*	440
Sayer & Son	497		

CREDON-ROAD :—

H. Line	£299	Holliday & Greenwood, Ltd.	£248
G. Brittain	296	H. J. Williams	246
W. Downs	270	Johnson & Co.*	235
Garrett & Son.....	249		

DAUBENEY-ROAD :—

C. Willmott.....	£190	Silk & Son	£181
Barrett & Power	187	Marchant & Hirst	174
Stevens Bros.	182	G. Barker*	158

GLYN-ROAD :—

Silk & Son	£167 0	C. Willmott	£144 0
McCormick & Sons	161 0	Barrett & Power ..	141 0
T. Cruwys.....	150 10	G. Barker*.....	139 0

IVYDALE-ROAD :—

H. Line.....	£180	G. Kemp	£121
H. Groves.....	169	Garrett & Son.....	119
J. & C. Bowyer	150	Maxwell Bros., Ltd.*	106
Rice & Son	125		

KING AND QUEEN-STREET :—

J. F. Ford	£247 0	H. J. Williams....	£179 10
Holliday & Greenwood, Ltd.....	245 0	W. V. Goad	178 0
Sayer & Son	236 0	E. Triggs*	164 0

MANSFORD-STREET (J.M. School) :—

J. F. Holliday	£170 10	G. Barker	£139 0
Stevens Bros.....	166 0	J. Haydon*	116 0
C. Willmott	164 0		

STANHOPE-STREET :—

T. Cruwys.....	£208 15	Bristow & Eatwell .	£175 0
R. S. Buckeridge..	185 0	Marchant & Hirst..	168 0
Wall & Co.	179 0	F. T. Chinchen....	167 10
F. Chidley.....	176 0	W. Chappell*.....	135 0

THE "SLADE" :—

Johnson & Co..	£222 0 0	E. Proctor*	£102 0 0
W. Banks.....	149 12 6		

UPPER KENNINGTON-LANE :—

J. & M. Patrick.....	£244	J. F. Ford	£159
W. Downs	198	Rice & Son	139
Smith & Son	195	E. B. Tucker	127
C. Brittain	171	Maxwell Bros., Ltd.*	123

UPTON HOUSE (Truant School) :—

Dearing & Son....	£292 0	Silk & Son.....	£170 0
Corfield & Co.	198 0	G. Barker	166 0
T. Cruwys.....	185 0	G. Wales*	143 9

WESTBOURNE-ROAD :—

Stevens Bros.	£199	W. Chappell	£165
Marchant & Hirst....	179	Grover & Son	153
McCormick & Sons ..	168	C. & W Hunnings* ..	150

WESTVILLE-ROAD :—

Bristow & Eatwell....	£159	F. T. Chinchen	£133
G. Neal.....	143	Brown & Sons*	129
W. Hammond.....	138		

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The Builder.

VOL. LXXXI.—No. 3953. AUGUST 10, 1901.

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Plans and Sections ..... *Double-Page Photo-Litho.*
New College, Scarborough.—Messrs. Hall, Cooper, & Davis, Architects ..... *Double Page Photo-Litho.*
Proposed Country House, N. Devon.—Messrs. Baillie Scott & Seton Morris, Architects ..... *Single Page Ink-Photo.*
Additions to Cottage at Rowledge.—Mr. T. Batterbury, F.R.I.B.A., Architect ..... *Single Page Ink-Photo.*

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The London Sewage Problem.

THE third report by Dr. Clowes and Dr. Houston on the "Bacterial Treatment of Crude Sewage" has recently been published by the London County Council, and is a comprehensive "red-book" of seventy-eight pages, with four full-page plates and nine coloured diagrams. It contains much new matter in addition to summaries of the experiments previously recorded, and affords food for thought to those who have claimed to purify crude sewage by simple filtration. The three reports and supplement taken together contain records of a very large number of tests, both chemical and bacteriological, which have been made with crude London sewage, and with effluents from primary and secondary filter-beds, and show clearly that, while filtration of crude sewage effects a considerable, though not satisfactory degree of chemical purification, it is of little use in destroying bacteria whether pathogenic or otherwise. Obviously a process of purification which depends for its success on the purifying action of bacteria must provide a suitable soil for their multiplication, and in the preliminary stages of the process the absence of any reduction in the number of bacteria need not be regarded with any feeling of dissatisfaction, but such a feeling may well arise when the *final* effluent is proved to be (bacteriologically) practically identical with crude sewage slightly diluted. The same kinds of bacteria and spores are present, the only difference being, as a rule, a slight reduction in numbers.

The report is entitled "Bacterial Treatment of Crude Sewage," but this is, perhaps, somewhat misleading. The attempts which were made to filter crude sewage proved unsuccessful, as the filter-beds were rapidly choked by particles of straw, chaff, cotton, and woollen fibres, &c., and, as we pointed out in our issue of April 7, 1900, the result of these experiments might be regarded as "a confirmation of the usual method of bacterial purification, which includes sedimentation and initial purification in tanks before the sewage is passed on to the filters." In the more recent experiments, a rough process of sedimentation was adopted, and has proved of great service in preventing the choking of the beds. Various methods have been tried, including (1) passing the sewage through tanks, and (2) letting it flow along troughs in which cross-divisions were fixed from the bottom to about half the height of the flow. In the supplement to the second report, it was stated that the experiments with the sedimentation-troughs were to be continued, but this does not appear to have been done; perhaps the authors of the experiments came to the same conclusion as ourselves—namely, that they were not likely to prove of much value. Instead of the troughs, tanks have recently been used, the flow being continuous, but in one series of experiments the tank remained nearly full during the emptying and aëration of the bed, and fresh sewage was passed continuously into it only during the filling of the bed. In these cases—to quote the words of the third report—"probably most of the liquid which passed into the coke-bed was therefore settled stale sewage, which was displaced by the incoming sewage." It is admitted that "some anaërobic (septic) bacterial action undoubtedly took place in this settling tank," and that there was "a considerable evolution of inflammable gas," but it is somewhat strange that the advantages accruing from the use of the tank are not fully stated. This omission we will attempt to supply.

The filter-bed was of coke, and had an area of 26¾ square yards, a depth of 13 ft., and an initial liquid space equal to 51 per cent. of the total contents of the bed. In all filter-beds a certain amount of settlement takes place, and the loss of liquid capacity in the bed under notice must in part be ascribed to this. When unsedimented sewage was used, the liquid capacity decreased from 51 per cent. in February, 1899, to 34 per cent. in June, and 28 per cent. in October. A wooden tank was then placed on the top of the bed, and the crude sewage was pumped into this and allowed to overflow. "The result of this rough settlement," we are told, "was that by January 12, 1900, the liquid capacity had increased from 28 per cent. to about 33 per cent." This conclusion is scarcely warranted, as the bed was not filled from December 22, 1899, to the date on which the liquid capacity was measured, and the increase of capacity was probably due to the three weeks' rest which intervened. We venture to think that the utmost which can be claimed for the wooden tank is that it checked to some slight extent the rate of choking of the bed. This view is supported by the continuation of the experiments from January 15 to April 5, 1900. On the latter date "the coke was . . . . seriously clogged upon the surface, and . . . . the bed had to be stopped in order to give time for the collection of matter in the upper part to become removed by bacterial action."

A rest of four weeks was therefore given to the filter, and on May 2 work was again commenced, but the crude sewage was passed through a brick settling tank in the manner already described, instead of through the wooden tank. The capacity of the brick tank was about 8,000 gallons; the liquid capacity of the filter on June 16 was 6,000 gallons (about 33 per cent. of the total capacity). This series of experiments was continued till July 28, and "no clogging of the upper parts of the coke has been noticed, and the liquid sinks readily into the coke-bed as soon as it is allowed to pass upon the surface." When the wooden tank was used, the bed was filled on the average 10·3 times per week, and the degree of chemical purification effected was 52·5 per cent. When the brick quasi-septic tank was used, the bed was filled on the average fifteen times per week, and the degree of chemical purification effected was 56·1 per cent. The brick tank therefore prevented choking, and improved the effluent of the bed, even though the rate of filtration was increased 50 per cent.

It is somewhat surprising, therefore, that further experiments with a proper septic tank have not been carried out. This thought appears to have struck Dr. Houston. He thinks it conceivable that the bacterial

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processes now in operation, which "aim at allowing certain bacteria or groups of bacteria to gain the ascendancy by a *natural process of selection*," might be improved by adding to the sewage "pure cultures in large amount of selected microbes," and suggests that experiments to this end might be divided into two stages—"the first aërobic, or semi-anaërobic, the bacteria used belonging to the class of putrefactive aërobes and facultative anaërobes; and the second stage purely anërobic, the micro-organisms involved in the process being those of nitrification, or, *preliminary to the above, and as an initial stage, anaërobic bacteria might be employed.*" The words we have printed in italics are very suggestive.

We need only state briefly some of the more important conclusions which may be drawn from the chemical analyses. The experiments with the 13-ft. bed lead Dr. Clowes to the conclusion that "there is no reason why a deep bed should not give as good results as a shallow bed, provided that it is as well aërated during the periods when it is empty." This proviso is the crux of the problem, and he therefore adds that experiments have proved that "even the bottom of the 13-ft. bed was well supplied with oxygen." Experiments were made with primary coarse beds and secondary fine beds. The average purification effected with crude sewage was as follows :—

Primary bed, coke	.....	22·5 per cent.
„ ragstone	.....	20·6 „
Secondary bed, coke	.....	63·2 „
„ ragstone	.....	49·1 „

The materials used in the primary beds were passed through a 4-in. mesh and rejected by a ½-in. mesh. The pieces were therefore of large size, and a further series of experiments with pieces which had passed a 2-in. mesh and had been retained by a ½-in mesh, increased the average purification effected by primary beds to 43·8 per cent. In this series, however, the filtering material was 9 ft. 9 in. deep, against 5 ft. in the first series. Of the secondary beds of this increased depth, the "coarse" bed (½-in. to 2-in. pieces) produced an effluent with an average purification (calculated on the crude sewage) of 62·5 per cent., while the "fine" bed ($\frac{1}{16}$-in. to ½-in. pieces) yielded an average of 76·2 per cent. These experiments show clearly the advantages of double contact. The filtration of the effluent from the chemical precipitation tanks, however, effected an average purification of slightly over 80 per cent., calculated on the crude sewage.

The second division of the report is by Dr. Houston, and deals with the bacteriological part of the question. We need not describe in detail the various experiments which he carried out. The broad facts are that the effluents from the filter-beds contained large numbers of bacteria and spores of bacteria of the same species as those found in the crude sewage. Particular stress is laid on the enumeration of *Bacillus Coli* and the spores of *B. enteriditis sporogenes*. The former is an organism abundant in the intestinal discharges of animals, and, although not classed as pathogenic, serves as an index of the possible presence of more dangerous organisms from the same source. The second bacillus is also found in excremental matters, and appears to be the cause of acute diarrhœa. Both these microbes were found in large numbers in the effluents, even when primary and secondary beds were used. Special search was also made for streptococci, and Dr. Houston considers this series of tests to be of "extreme value" for four reasons, which may be thus stated :—

1. Streptococci are as a class among the most pathogenic of the bacteria yet known.
2. They are delicate germs, and very readily lose their vitality and die.
3. They are present in the intestinal discharges of animals.
4. They are absent from water and soil, unless these have been recently contaminated.

Dr. Houston's experiments showed that "there did not appear to be any significant alteration in the number of streptococci as the result of the bacterial treatment of the raw sewage."

Some mice inoculated with broth cultures of streptococci from the effluents died in a few days; others were apparently unaffected. It is clear, however, that many of these delicate but dangerous organisms survived the rough process of sedimentation, and single and double filtration, and Dr. Houston now throws doubt on his previously expressed opinion that "some, at all events, of the pathogenic organisms are crowded out in the struggle for existence in a nutritive medium containing a mixed bacterial flora, their vitality being weakened or destroyed by the enzymes of the saprophytic species." The final "biological conclusion" at which he arrives is undoubtedly startling, and shall be stated in his own words :—"In view of these results, only one conclusion seems possible, namely, that however satisfactory the process may be from the chemical and practical point of view, *the effluents from the bacterial beds cannot be reasonably assumed to be more safe in their possible relation to disease than raw sewage slightly diluted but otherwise unaltered in its bacterial composition.*"

It must not be forgotten that the bacterial treatment adopted in these experiments differs in some important particulars from the methods generally recommended, but Dr. Houston appears to think that, no matter what known bacterial process is adopted, the effluent will be biologically unsatisfactory. It is strange, he says, that "many still consider the effluents from coke beds and in general from bacterial processes non-pathogenic." We may here point out that the results obtained in these London experiments are much less satisfactory than others obtained at Exeter and elsewhere. Dr. Houston himself has shown that the number of spores of *B. enteriditis sporogenes* present in crude sewage (1,000 to 10,000 per c.c.) was reduced by the Ducat filter to 10 per c.c. In the London experiments, the number in the effluent was "usually less than in the corresponding samples of crude sewage," but "the reduction was not very well marked, and was not, moreover, a constant feature." The actual number remaining in the effluent from the 13-ft. coke bed was usually at least 100, but less than 1,000 per c.c. The unsatisfactory nature of the London effluents, both chemically and bacteriologically, is to a large extent due to the faulty method of treatment and to the makeshift apparatus, and it is scarcely fair to use these experiments in wholesale condemnation of all bacterial processes. The London experiments were made with the specific object of discovering a rapid process of treatment which would produce an effluent sufficiently free from impurities to be discharged into the tidal waters of the Thames without creating a nuisance. A high standard of purity is, under such circumstances, unnecessary.

More thorough treatment is clearly required for inland towns, and this can be obtained by initial purification in a tank, followed by double or even treble filtration as recommended by the Manchester experts, or by the still more differentiated system of filtration adopted by Mr. Scott-Moncrieff at Caterham. In exceptional cases it may even be necessary to precipitate the sewage or to sterilise the filtrate by means of chemicals, but even those present no insuperable obstacles. Dr. Houston's report will be of service in drawing attention to the difficulties and possible dangers of bacterial treatment, but need not be regarded as by any means an unanswerable condemnation of it. Indeed, Dr. Houston himself recommends that the bacterial process should be adopted for London sewage in lieu of chemical treatment; "it would be idle to deny its value or attempt to minimise its usefulness simply because it falls short of a standard of absolute perfection."

NOTES.

The New Government Offices.

We reprint on another page the letters which have appeared in the *Times* from three members of Parliament — Mr. Soames, Mr. Whitmore, and Lord Balcarres—protesting against the carrying out of the new Government Offices by the Office of Works. Every one who is interested in our public architecture ought to be grateful to these Members of Parliament for taking the trouble to raise the question, though we fear they are in a very small minority in the House of Commons, where such subjects are mostly considered of no account. It is noticeable also that the *Times*, which could afford a leading article on the subject of the widening of Piccadilly in support of the views of its correspondents, has nothing to say on this more important subject. The *Times* is a faithful representative, in these matters, of the spirit of the English public, which can get up a great deal of ardour on the subject of a street improvement and the cutting down of trees, but can take no interest in the question of the adequate carrying out of a great work of architecture. However, we hope the subject will not be allowed to drop just yet.

The Widening of Piccadilly.

The objections which we were the first to make to the proposed widening of Piccadilly by taking a strip off the Green Park, as involving the sacrifice of trees without any real relief to the pressure of traffic at the two ends of the widened portion, have been followed up by numerous correspondents in the *Times*, who have given expression to the same opinions. Sir E. J. Poynter, in a letter at once practical and artistic in its spirit, observes that the trees along the Green Park margin of Piccadilly give a peculiar charm to that portion of the street; "they are the survival of a time when London was a less hideous Babel than it now is, and linger there as a reminder of a past and more tranquil condition of life"; and the promise

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that eleven of them will not be cut down will not, he is sure, satisfy the public. The scheme is altogether an absurd one, which will spoil that part of London and at the same time be of no avail whatever in removing the real block of the traffic, which occurs at the west end of the Green Park where north traffic crosses Piccadilly from Park-lane. In respect of this part of the question, Sir J. Wolfe Barry, in a letter in Thursday's *Times*, revives the proposal for a sunk road under Piccadilly, and this is the only way in which the block of the traffic near Hyde Park Corner can be relieved. This proposal for a sunken road was made many years ago by the present Editor of this journal, in a letter which was published in the *Builder*, accompanied by a plan, at the time when the ill-advised removal of the Constitution Hill arch was first proposed. It was there shown that the arch might be retained in its original position, and a road taken under Piccadilly and under Constitution Hill into Grosvenor-place. This would have done all that was wanted, without destroying the perspective of Piccadilly by removing the arch and making the present shapeless and inconvenient open space.

The Housing Problem in Parliament.

THE discussion of the Estimates on Monday gave an opportunity for some desultory remarks on the subject of the housing of the working classes. There was on the part of the Government another indefinite suggestion that a Bill should be brought on to improve the existing law, and on the part of the public, represented by Sir J. Dickson-Poynder, the complaint that the time for the repayment of money borrowed by Local Authorities should be extended. The Government, though willing enough that posterity should pay for the war, are very stringent guardians of the rights of posterity in the matter of local loans, and we do not for a moment expect to see the period over which the repayment of local loans is spread increased. A suggestion by this same member that when railway companies take land for improvements, and have to rehouse a number of the working classes, they should, instead of building themselves, hand a lump sum over to the Local Authorities for this purpose, is well worth considering. Railway companies have their own special business to manage, and it would certainly seem more reasonable from every point of view that the rehousing should be done by the Local Authority, who are accustomed to deal with this matter.

The Improvement of English Roads.

MR. LONG'S reply to the deputation which he received last week on the subject of the improvement of roads was not very sympathetic. But in truth the proposal of the deputation that the Central Government should take over the main roads was not practical. In theory there is a good deal to be said for it. But in this country the care of the highways has, from time immemorial, been a local business, and at present the desire of every one is to decentralise as far as possible. Therefore, to discuss the question of a Governmental control of the highways is a mere waste of time. What is desirable is that the County Council should become the sole highway authority in each county. In some counties they have, by a stretch of the meaning of main roads, obtained almost complete control of the highway system. A short Act of Parliament, by which they would be constituted the only highway authority, would be a decided, and at the same time a practical, step towards the continued improvement of English roads. Mr. Long was quite justified in saying that the condition of the rural roads had lately improved, but it is by the existence of the County Councils rather than of the District Councils.

The Leeds Churches Bill.

THIS measure has been finally passed through all its stages by the two Houses of Parliament. It provides for the redistribution of certain ecclesiastical parishes and districts within the borough, and for the building of a new parish church—to replace St. Edmund's—on the borders of Roundhay and Moortown, and of a new parish church, instead of St. Paul's, in the present parish of St. Luke, Beeston-hill. The last-named church, together with the vicarage house, and those of St. Stephen, Burmantoft, and St. Philip, are to be pulled down; the proceeds of the sale of the sites and materials will be devoted to the purposes of the new churches and their endowments. St. Stephen's Church was built in 1853-4, at a cost of 3,000*l.*, after the plans and designs of J. Dobson. The architect of St. Philip's Church (1846-7) was R. D Chantrell. The fabric, which cost about 5,000*l.*, has a nave of five bays with clear-story and aisles; on the south side is a tower with an octagonal ribbed spire; the nave and chancel have hammer-beam roofs. St. Paul's Church, standing in Park-square, was built of stone, in 1791-3, for 1,175 sittings, at a cost of 10,000*l.*, upon a site given by Dr. Christopher Wilson, who was Bishop of Bristol in 1783-92. At the west end is a portico consisting of a Classical order of four Ionic columns with a pediment. From above it rises a light tower in three stages. The interior was renovated fourteen years ago.

Municipal Telephones.

THE recent public opening of a municipal telephone system at Tunbridge Wells is a notable event in the history of telephony in this country. Several electricians have taken a gloomy view of this new development of municipal trading, and have prophesied that it will be a financial failure. Judging, however, from the enthusiasm with which the ratepayers are supporting the new municipal venture it promises to be a success. The Corporation have powers to supply over an area of about 200 square miles, and they have already obtained 330 subscribers. In Tunbridge Wells the trunk mains are underground, so that the exchange is on the ground floor instead of in the top of the building as usual. The final distribution is done by short spans of wire supported by distributing poles. The system has been well designed and contains many novel departures from ordinary practice, most of which are due to the consulting engineer, Mr. A. R. Bennett. The charges are most moderate when compared with those ordinarily made by the National Telephone Company. For an unlimited day and night service the charge is 5*l.* 17s. 6d. per annum, or if the client desire he can pay a fixed rental of 3*l.* 10s. with a toll of ½d. per outward call, or a fixed rental of 2*l.* 10s. with a toll of 1d. per outward call. Some years ago the National Telephone Company whose charge was 10*l.* was asked to reduce it to 7*l.* The reason given for not acceding to this request was that to work at less than 10*l.* meant working at a loss. However, they have now stuck up notices offering to give any one an unlimited service for a rental of 4*l.* These tactics were successful at Dundee where they first of all reduced their price from 10*l.* to 5*l.*, and then bought up the local company. It will be interesting to see how they answer with the Corporation of Tunbridge Wells. In Glasgow the municipal telephones, although the opening ceremony has not yet taken place, are proving a success, and there are upwards of 1,000 telephones in operation, whilst there are 5,400 names on the books. In Guernsey what is practically a municipal telephone system has been in operation three years, and they are making a profit on an annual charge of only 3*l.* 5s. One of the consequences of cheap telephones in Guernsey is that the number of inhabitants per telephone (forty-four) is less than in any other part of the United Kingdom. Of course, there are many places abroad where the number is very much smaller; in Stockholm, for example, there is one telephone for every eight people. It will be seen that there is plenty of room for enterprise in this direction.

Water for Domestic Purposes.

THE recent decision of Mr. Justice Buckley in what will henceforth be known as the Barnard Castle case has an important bearing on the charge for the supply of water. The question was raised whether the supply of water to a swimming-bath at a school could be considered as supply for domestic purposes, or whether the Local Authority were entitled to charge an extra sum for the amount of water so used. The decision of the Judge was that this water was used for domestic purposes. This decision seems to have a broader bearing than many other judgments, because it appears to enlarge the meaning of the phrase "domestic purposes." The decision of Mr. Justice Buckley was based on the reasoning that the swimming-bath was part of the domestic apparatus of the school; that the bath itself was not kept for the purposes of trade. There is no doubt a growing feeling in the community in favour of the largest and most unlimited and cheapest supply of water possible. Nothing is more paradoxical than that medical and sanitary experts should be continually preaching the need of cleanliness in habitations as a protection against disease, and yet that in this immense metropolis the cost of water should make its complete use almost a luxury.

St. Helens, Isle of Wight.

FROM a Report to the Local Government Board upon the sanitary circumstances and administration of the urban district of St. Helen's, Isle of Wight, by Dr. H. Timbrell Bulstrode, it appears that the supply of water is procured under very unsatisfactory and unsafe conditions. On St. Helens Green there are numerous wells sunk, presumably in the gravel. Some of these wells have pumps attached thereto; others are furnished with means for lowering and elevating a bucket.

"The pumps were at the date of my visit out of order, and the water supply of St. Helen's was being largely drawn from these wells, the covers to which were off in every instance, and thus the well

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water was not protected against surface pollution. Moreover, there was no means of reaching water from these wells other than by the use of private buckets, the introduction of which into the water was to be condemned, seeing that they might have previously been utilised for undesirable purposes or have been brought from houses wherein was infectious disease. It did not appear to me that the District Council had taken proper precautions to prevent the continuance of this dangerous practice, which had clearly been in vogue for a very considerable period."

Dr. Bulstrode's Report also states that the drainage system is in an unsatisfactory and backward state, a great deal of it being taken by clay-jointed pipes, and many of the water-closets being without flushing apparatus, and having to be flushed by hand. As the Report says, "There is still a large amount of work to be done in the St. Helens Urban District before that district can lay claim to have modernised itself in a sanitary sense."

The Broad Sanctuary.

It is to be hoped that the opening of the piece of the Broad Sanctuary on which Canning's statue stands and the placing of seats there, which has been promised by the Commissioner of Works, will be done without delay. It will not only form an agreeable and shady spot in the present hot weather, but the removal of the railings will give a sense of space and freedom which the interesting space at present lacks. A great change in the character of the railings which surround many of the open spaces of London is much needed. In too many instances they have a prison-like character which is far from pleasant. The removal of the heavy rails on the drive of Hyde Park from the Marble Arch to Apsley Gate has greatly added to the spaciousness of that part of the Park. No one who has compared the confined look of St. James's-square, with its high and unsightly railings and its dense mass of unflowering shrubs, with the more open character of Berkeley-square, cannot but regret that more freedom is not given to the open spaces of London.

The German Chapel Royal, St. James's Palace.

Concurrently with some changes that are being effected of the number and status of the King's chaplains and with a reduction of the ecclesiastical establishment of the Court, the German services at the Chapel Royal, St. James's, have been discontinued, the final service at the Lutheran Hofkapelle having been celebrated on Sunday, 4th inst. The present building, which stands on the east side of Friary-court, had its origin in the Roman Catholic chapel which Charles I. established at St. James's Palace for Queen Henrietta Maria, and which was afterwards appropriated for the uses of Charles II.'s consort, Katharine of Braganza. Soon after the Restoration, Cardinal Philip Howard, the Queen's lord-almoner, installed a community of Portuguese Capuchin friars in a new building adjacent to what was then known as the Queen's Chapel, wherein, as Pepys records, Queen Katharine attended mass for the first time on September 21, 1662. Pepys also describes a visit he made to the friars and their new buildings in January, 1667. After King William III. had ascended the throne the chapel was assigned, by name of the French Chapel Royal, to a congregation of Huguenot refugees; and then, during the following reign, it was taken for the Lutheran services established at St. James's by Queen Anne and her consort, Prince George of Denmark. An interesting survey of the palace and convent which is appended to the rare pamphlet entitled "A Full Answer to the Depositions . . . concerning the Birth of the Prince of Wales. The Intreague thereof detected . . . London, 1689," shows "a burying place" where is now the open space of Friary-court, the "cloisters" abutting against the east end of the chapel, and "Friary Garden" lying between the cloisters and the wall of St. James's Park; on the north of the chapel are the dormitories and the entrance into the convent. The "Great Yard next St. James's Park" on the south side of the chapel and the "Friary Garden" are now covered by the garden of Marlborough House. In August, 1708, the Duchess of Marlborough's trustees obtained, for a payment of 2,000*l.* and a yearly rent of 5s., a fifty years' lease of the Friary and its grounds; in 1709 that lease was cancelled in favour of another one, which included two acres (with the aviary) then known as the Royal Garden. Vardy removed the remaining conventual buildings in 1748, and about one hundred years afterwards was laid out the road which opens out of Pall Mall, passing Friary Court and the chapel, into the Mall, St. James's Park.

Verandahs.

There is a common saying that a man who is his own lawyer has a fool for his client. We are inclined to think that this might even apply to the person who is his own architect. A good example of the foolishness of amateur advice appeared in the *Daily News* of Saturday last. In a special article on the keeping of houses cool, which contained much sensible and much needed general advice, it was stated that the best external means of keeping a house cool was a verandah; the next, outside shutters or blinds. But there is a fatal objection to a verandah or any permanent protection from the sun in this country, because it keeps away light at all seasons of the year. A room to which a verandah is attached in England nearly always is disagreeably dark and gloomy and often damp, while the verandah itself requires constant painting, and unless covered with creepers is usually unsightly. Modern architects, whatever their shortcomings may be, have rightly appreciated that verandahs are objectionable, and they are now seldom seen except in houses of the end of the eighteenth and beginning of the nineteenth centuries. If the writer had dwelt, as we recently did, on the paramount importance of outside shutters, whether solid or rayed, and of outside blinds, he would have done more good than by referring to the exploded verandah.

Open Spaces.—Now that the garden of Finsbury-circus has been opened to the public by the City Corporation it is proposed that they should similarly acquire the enclosure of Finsbury-square, which was laid out by Dance the younger, who built the houses in the interval 1777 (west side)—1791 (south side). The garden of Finsbury-circus, which extends over one-and-a-half acres, is remarkable for the number and variety of its trees and shrubs; amongst them are walnut, apple, and mulberry trees, limes, planes, elms, the Indian bean tree, several kinds of poplars, acacias, and birches, together with lilacs and laburnums, the bladder senna tree, golden privets, garden willows, the sophora japonica, yuccas, and the eucalyptus.—On July 28 was opened a public park, thirty-two acres in area, at Tipton, which has been acquired at a cost of 10,000*l.* as a recreation ground.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT NOTTINGHAM.

(*Continued*).

The morning of Friday, July 26, was devoted to the annual business meeting of the Institute, which was held in the Exchange Council Room, under the presidency of Sir Henry H. Howorth. The Secretary read the annual report, which showed that both financially and in other respects the Institute was in a flourishing condition. Various suggestions were made as to the place of next year's meeting, Worcester, York, and South Wales being advocated amongst others. Eventually the selection was left to the Council. On the proposal of the President a resolution was passed pointing out the desirability of printing the Chartularies of Rufford and Welbeck Abbeys and of the Priory of Newstead.

At the conclusion of the proceedings the party journeyed by train to Mansfield on a visit to Hardwick Hall. Immediately after luncheon at Mansfield a tremendous downpour of rain prevented a start being made, but eventually the journey was resumed only a little after time. On arrival at Hardwick Hall the party was most graciously received by Lady Louisa Egerton in the great hall, after which Mr. J. H. Gotch, F.S.A., read a paper on the history of the building. "Hardwick Hall," he pointed out, "is a building of considerable interest to the student of English domestic architecture, inasmuch as it is a good example of one manner of the Elizabethan designers, and it has undergone no very serious alterations since it was built. It has suffered, like most houses of that time, from age and from the changing fashions of its inhabitants; but such changes as it has experienced have been in comparatively small matters; so that in the general disposition of its plan, and in its external appearance, it remains to-day very much the same as when the eye of its founder, Bess of Hardwick, last fell upon it. This Bess of Hardwick was a notable personage, a woman of great ability and strong will: and being possessed of considerable wealth, she left her mark upon the times in the shape of several large houses, of which this is one, and the only one surviving, the others being Chatsworth (which has been rebuilt) and Oldcotes. She was the daughter of John Hardwick of Hardwick, and was born in the old hall, of which the ruins still remain in front of this house, and near the brow of the hill. That she was a woman of great ability and personal attractions is sufficiently proved bythe fact that she married four husbands and survived the last. Her first husband was Robert Barley of Barley. Her second was Sir William Cavendish of Chatsworth, ancestor of the present Duke of Devonshire, the owner of Hardwick. Her third was Sir William St. Loe, and her fourth was George, Earl of Shrewsbury. It was after her marriage to the last named that she built Hardwick Hall, since her initials, E.S., and a coronet form a conspicuous part of the ornamental balustrade on the towers. The date usually assigned to the house is 1576. There is a chimney-piece in one of the bedrooms dated 1588, another in the dining-room dated 1597, and the door of the room called after Mary Queen of Scots is dated 1599. The new hall and the old hall stood side by side, and both were in use for many years. The old hall is, indeed, not much older than the new. Much of it has disappeared, but judging by what remains its general disposition was symmetrical, its windows, as can be seen, are mullioned and have rectangular lights; its whole appearance points to a date about the middle of the sixteenth century. Tradition gives this house as the birthplace of Bess in 1520, and perhaps a careful search might reveal indications of a building of that date. But if anything of it still survives, it certainly would seem as though the old house had been modernised during the second half of the sixteenth century, an additional proof being the remains of a plaster frieze, with figures modelled in relief, of the same character as the frieze in the presence chamber of the new house. Having been thus brought up to date, the old house was not left to immediate decay in consequence of the erection of its rival, for we learn from the ingenious Mr. Collins, who quotes Bishop Kennet's memoirs of the Cavendish family, in his account of the Dukes of Devonshire, given in his 'Peerage,' that one room was of such exact proportion and such convenient lights, that it had been thought fit for a pattern for a room in Blenheim House. This,

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therefore, brings us well into the eighteenth century before the old house fell to ruin. It is not unlikely that the older house was the more comfortable of the two, for Hardwick Hall can hardly be considered as a model of convenient planning. It belongs to that species of house of which a large number were built in Elizabeth's days: a house designed as an exercise in symmetry rather than as a dwelling. True, it contains the apartments which were then considered essential, but they are arranged with less than the usual care to secure comfort and convenience. What must strike every one who first sees Hardwick is the great size and number of the windows. This has given rise to the well-known jingle, 'Hardwick Hall, more glass than wall.' It is a fault common to many of the houses of the time, and one which Lord Bacon protested against in his oft-quoted complaint that 'You shall sometimes have fair houses so full of glass that one cannot tell where to become to be out of the sun or cold.'

The fact that windows were so large and plentiful is one of considerable interest and significance, for it emphasises the complete change which had come over house-planning in the space of a few years. Thirty or forty years earlier windows were somewhat jealously introduced, especially on outer walls, for the necessity for defensive precautions had then hardly ceased. Here at Hardwick, however, no thought of defence is apparent, everything is done to procure the largest amount of light and air. The windows, in fact, are overdone; they make the circuit of the walls with relentless symmetry; and not a few of them have been blocked up inside in order to render the rooms habitable. Some of them were shams from the outset, and have fireplaces against them, and not a few of them are crossed by floors, so that the lower lights belong to one story and the upper to another. That is what comes from trying to carry out a preconceived idea, namely, that of absolute symmetry, instead of making the convenience of the house the first consideration.

The room called after Mary Queen of Scots, which is situated high up on the second floor in one of the projecting turrets, has three of its sides on the exterior filled with windows; on the inside, however, only one side is lighted, the fireplace occupies the second side and the bed the third. The room is called after Mary, and has the arms of Scotland over the door, but there is no record of the exact length of her residence in semi-captivity in this house. She was for seventeen years under the care of the Earl of Shrewsbury and Elizabeth his wife, and towards the end of that time her attractions bade fair to rival those of the redoubtable Bess herself, so that, according to old Fuller, when Queen Elizabeth inquired of the Countess how her guest did, that lady replied: 'Madam, she cannot do ill while she is with my husband, and I begin to grow jealous, they are so great together.' Fuller adds that in consequence of this intimation Elizabeth, who disliked anything approaching to a friendship between Mary and so great a peer, gave her into the custody of others. Mary was beheaded in 1587, and as the door of her room is dated 1599, the probability is that it was adorned in her memory, evidently not for her own proper delectation. But leaving the gossip of history, let us look a little more closely into the architectural character of the building. Attention has already been called to the symmetrical character of the plan. The house consists of a large oblong with two projecting turrets on each of the long faces and one on each of the short faces. The door, as usual, is in the middle of one of the long sides, but the hall into which it gives access is not disposed in the fashion which had been customary up to this period, and which still prevailed in most Elizabethan houses. That fashion is followed in the halls of colleges: it placed the hall lengthways with the building; at the entrance end a strip was cut off by a screen and became a passage, called the 'screens'; the front door was at one end of this passage, the doors of the hall were in one side of it, and the doors to the buttery and kitchen department were in the other. The hall was lighted by windows along the sides, and at the opposite end from the screen was the dais with its bay window, and beyond this end were the family rooms. Here, at Hardwick, the hall, instead of being placed lengthways with the building, goes across it from side to side. Instead of it being lighted down the sides, it is lighted at the ends; the front door, instead of being in the end of the 'screens,' is in the middle of one side of them, while at the ends were the doors to the servants' department and also the buttery hatch, all of which are now built up. This unusual disposition may not seem of much importance, and it may be said that although the hall lies differently in relation to the house, yet all the usual features are there, the screens, the buttery hatch, and so forth. But the difference of arrangement nevertheless is indicative of a momentous change, and one which distinguishes mediæval houses from modern. Up to Elizabeth's time, and even James I., the hall was the centre of the family life; it lay between the family rooms and those devoted to the servants. The dais end, with its bay-window, was reserved for the family, and there they dined; adjacent to this end were the parlour and the staircase leading to the bedrooms and other principal chambers. But already the custom of dining in the hall was falling into desuetude, the family sought smaller and more private rooms. With their withdrawal the character of the hall changed, and it tended to become no longer a living-room, but an entrance-hall or vestibule for passing traffic. This alteration of character became thoroughly established in the time of Inigo Jones, and has remained to the present day.

One of the tests of the age of a house is the disposition of its hall; in mediæval times it was a living-room, in modern times it is a vestibule. The hall at Hardwick, owing to its plan, is leaving the mediæval type and approaching the modern. It may have had a dais, but probably not. Even if it had, that end had not the snug feeling of the old-fashioned arrangement, with its bay window and the fireplace fairly close to the seats of the chief personages. It must have been somewhat uncomfortable, as on each side of that end is a passage leading to a principal staircase. I have said 'staircase,' but indeed Hardwick may be said to have no 'staircase'; it has, instead, long flights of steps. By 'staircase' is meant a special feature, either of wood or stone, such as is the pride of most Elizabethan houses. There were very few stone staircases in English houses of this period; Burghley House has, so far as I know, the only good example. But there are hundreds of splendid wooden staircases, and in a house of the pretensions of Hardwick one would have expected to find a particularly fine specimen. But throughout the house the detail is disappointing; everything is large and coarse, including chimney-pieces and doorways. It is rather in its general disposition and the size of its rooms that Hardwick is interesting. When one comes to examine the work closely there is an absence of that fancy and fertility of design which distinguishes the better class of work of that period. But although the means of getting upstairs are not very interesting, there are some fine rooms to go to. There seem to be no family rooms on the ground floor, unless they have been turned from their original purpose. All the principal apartments are on the upper floors, and as each story is unusually lofty, the whole height of the building is much greater than was commonly the case. The hall itself is two stories high, and the only access from one half of the house to the other on the first floor lies across the gallery over the screens. The principal rooms on this floor are those now called the dining and drawing-rooms; in addition to these there are a few bedrooms and various small apartments, contrived to meet modern requirements. The finest apartments, however, are on the second or top floor, where we find the presence chamber and library and the long gallery, besides a fine bedroom and the room named after Mary Queen of Scots. Above these rooms, and partly in the roof, are a number of subsidiary bedrooms. The presence chamber is a large and lofty room, with a very deep frieze of modelled and coloured plasterwork representing hunting scenes. The quality of the work is not very high compared with what was being done in Italy and France at the same time, but it has considerable vigour, and imparts a fine and stately character to the room. Over the chimney-piece in the library adjoining is an alabaster panel of very considerable merit, representing Apollo and the Muses. The long gallery occupies the whole length of the east side of the house, and is a lofty and handsome room. It is the only apartment which retains its original ceiling, and as the ceilings of Elizabethan houses exhibited some of the most original and attractive work of the period, Hardwick suffers much from their absence. This particular ceiling, however, has no special claim to admiration; it is one of the plainest and least interesting with which I am acquainted. In this respect it is only in keeping with the rest of the detail of the house. The long gallery was one of the characteristic features of our Elizabethan house. The longer the better, designers of the day used to think, and although this is of considerable length, being 166 ft. long, there were several houses in which the gallery was longer still, reaching to as much as 200 ft. and 250 ft. The rigid symmetry of the external treatment has already been referred to. It is as complete in its way as that of Wollaton, but the latter house derived more than symmetry from the classic proclivities of the day. It also obtained the pilasters and niches with which its walls are adorned. Hardwick has none of these, and is an example of the fact that they were by no means necessary, although they were a very constant ingredient in the design of the period. The treatment of the windows here resembles in some degree that employed at Wollaton, or, rather one should say, Wollaton followed Hardwick to a certain extent. In both places there is a projecting moulding or architrave which makes a framework round the window, and rests at the bottom upon a projecting sill, which is supported by small brackets. The mouldings of the jambs, mullions, and transomes, however, differ in the two examples. The cornices which divide the various floors have only a general resemblance, and the balustrade which crowns the walls is as meagre in the one house as the other. The finish of the turrets here is not so ambitious as at Wollaton, as instead of an elaborate curly gable, there are only the Countess's initials and coronet supported by a Dutch flourish, a humble member of the same family which is so conspicuous on the towers at Wollaton.

There are here valuable accessory features which are now wanting at Wollaton, as well as at most of the houses of that time which have come down to us. I mean the garden walls and lodge. The lodge was almost as much a part of an Elizabethan home as the great hall and long gallery, but being of small size and detached from the main building, it has in the majority of cases been swept away in favour of some kind of landscape-garden effect. Happily, it has escaped in this instance, and remains, together with its supporting walls, as an example not only of the manner of laying out the approach to an Elizabethan house, but also of the quaint and sometimes unworkmanlike way in which artificers treated their materials. In looking at the laying out of Hardwick the visitor must beware of confusing the original arrangement with the excellent garden laid out by Lady Louisa Egerton on the south side, which, by the lapse of time, has assumed an appearance admirably in keeping with the house. In conclusion, I desire to leave the domain of architecture for an instant to call attention to the great amount and excellent preservation of the tapestry which clothes the walls, and vividly illustrates this method of decorating them, and also to the interesting furniture which survives in considerable quantity. These two things reconcile us to the absence of fascinating architectural detail, and help to make Hardwick one of the fine examples of a large Elizabethan house."

After a cordial vote of thanks to Mr. Golch for his excellent paper, the party was conducted over the house by Lady Louisa Egerton, who pointed out the chief of the many features of interest, such as old pieces of furniture, the pictures, and the priceless series of tapestry hangings. The long gallery is now the only room retaining its original moulded plaster ceiling; but Mr. Micklethwaite was of opinion that the "presence chamber" once had one to match the moulded and painted plaster frieze, despite the absence of a cornice. The question of the nationality of the alabaster panel in the library, representing Apollo and the Muses, was referred to Mr. Hope, who thought that the cartouche with the initials "E. R.," and the treatment of the Royal arms, pointed to an English origin. After a hurried glance at the fast-crumbling ruins of the old hall close by, the return journey was made to Mansfield, and thence by rail to Nottingham.

At the evening meeting in the Exchange Council Room, Mr. E. W. Brabrook, C.B., F.S.A., read a paper on "Robin Hood," an ever-popular hero, whose history existed principally

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in ballads. Some denied that Robin Hood had any real history, but Mr. Brabrook dissented from the view that he did not exist in the flesh. There was a strong English flavour about the ballads, and he did not see why it should be doubted that they had some foundation in fact.

Early on Saturday, the 27th, a special train conveyed the members to Newark, where the ruins of the castle were first examined, under the guidance of Mr. John Bilson, F.S.A. It was first built, he said, by Alexander, Bishop of Lincoln, 1123-1147, but of his work only the gatehouse, a good example of unusual size, now remains on the north, and a small portion of the west wall. Half the front towards the river formed part of the great hall, the fine cellar of which still exists in a very perfect state. It is of late twelfth-century work, with an unribbed vault carried by a central row of pillars. Of the keep and other buildings there is nothing left to indicate their site.

The party next drove to Hawton Church, which was described by Mr. W. H. St. John Hope. The western tower, he said, was the work of Sir Thomas Molineux, of Sefton and Hawton, who died in 1491, and whose arms, with those of his second wife, were in the spandrels of the west doorway. To him was also probably due the clearstory and upper parts of the aisles, together with the wooden roofs, but the arcades and aisle walls were of the thirteenth century. The quoins of the Norman nave remain against the tower. But the glory of the church is the beautiful chancel of three bays, with its splendid sedilia, Easter sepulchre, and founder's tomb and effigy, all of richly carved work, built by Sir Robert Compton, lord of Fenny Compton and Hawton, who died in 1330. Some discussion took place concerning the Easter sepulchre, which Mr. Micklethwaite thought might also have been used as a "sacrament house" after the Scottish manner. Mr. Hope also called attention to the rood screen and the old benches in the nave. On the motion of Sir Henry Howorth, a sincere vote of sympathy was passed to the rector, the Rev. R. Washington, who was prevented from being present owing to the death of his wife on the previous day.

After luncheon at Newark a move was made for the Town Hall, where the Mayor, Mr. W. Atter, welcomed the Institute to Newark, and exhibited the municipal insignia and the church plate. Mr. Cornelius Brown read some notes on the history of the plate, which was also described by Mr. Hope, who called special attention to the waits' badges, a good example of a Monteith of 1693-4 with movable rim, and a set of thirteen silver beakers with one common cover, made in 1688-9, in their original leather case. Mr. Bell added some remarks on the church plate.

A visit was next paid to the fine parish church of St. Mary Magdalene, which was lucidly described by Mr. John Bilson. The church of Newark, he said, was one of those given by Robert de Chesney, bishop of Lincoln, 1147-67, to his new foundation of the Gilbertine Monastery of St. Catharine, near Lincoln, and important works were soon after undertaken, of which fragments remain that possibly represent a complete rebuilding on a larger scale. These fragments included the crypt beneath the old east end, now consisting of two bays, forming an interesting study of mid-twelfth century vaulting. The piers of the crossing, which formerly carried a central tower, were also of the same date. The present western tower was begun in 1230 and was designed on a grand scale, but during the work the design was altered, and the tower, which was originally intended to stand clear of the aisles, had aisles carried up to the western face. Mr. Bilson went on to point out the gradual growth of the church, coming to the early part of the fourteenth century when the south aisle was erected and the upper stages of the tower and spire. There was documentary evidence with regard to the south aisle, for in 1312 Archbishop Greenfield granted a licence to Henry of Newark to remove a chantry chapel in the churchyard and to convert the materials to the use of the church, and "the fabric of a certain aisle, which it was proposed to construct anew." This proved the intention in 1312 to build a new aisle, but he thought the work was of a somewhat later character, though it was exactly in line with the extremely fine fourteenth century work found in South Lincolnshire, and especially in the neighbourhood of Boston and Sleaford. The aisle was set out the same width as the nave, designed for a pitched roof, and was probably only just completed before the Black Death of 1349. The effect of the Black Death in Newark might be seen by a licence to enclose a new churchyard. Of the later rebuilding after the plague they had the nave, the north aisle and transept, and a chancel. There was little difference in detail in the work here, in fact, none in the north side until they came to the extreme east end, where there was a slight difference in the mouldings which might indicate a somewhat later date. Documents showed that in 1460 payments were made for church work, and in 1483 Nicholas Cayser bequeathed money to the new building of the chancel "in case it should be built anew." The fourteenth and fifteenth century builders modelled the church into a harmonious whole, working round the parts of an earlier date. The preservation of the early pillars was probably due to the fact that the work was undertaken in sections, and the pillars afforded a convenient point around which it could be carried out. Mr. Bilson went on to speak of the large number of chantries which existed and of the adornments of the church, noticing the reredos, which was completed by Thomas Drawswerd, of York, carver, in 1508, the chantry chapels, the screen, and other features of interest.

After some remarks by Mr. A. R. Bax on the monumental brasses, notably the large Flemish one to Alan le Fleming, 1361, a cordial vote of thanks was passed to Mr. Bilson for his paper.

The party next drove to Holme, where the church was described by the Rev. A. F. Sutton. It consists of a chancel with south chapel, a nave with south aisle and porch, and a western tower with low spire. The greater part of the church was rebuilt late in the fifteenth century by John Barton, merchant of the Staple of Calais, who died in 1491. His tomb, with effigies of himself and wife, with a cadaver under, remains on the south side of the altar, and a rich band of shields of his arms and of other members of his family is carved over the porch. The original screenwork and pews remain throughout the church, though now sorely decayed and whitened with age. Some of the old painted glass is also left, including portions of figures of saints turned upside down to mollify the wrath of the Puritans against superstitious images. The Barton chapel, south of the chancel, has two good niches on either side the east window. Mr. Micklethwaite criticised the staring black mortar with which the north wall of the nave had been pointed after being stripped of its proper coating of plaster. After thanking Mr. Sutton for his remarks, the members returned to Newark and by train to Nottingham.

Monday, the 29th, was devoted to an expedition to Worksop and Blyth. On arrival of the train at the former place, carriages were in readiness to convey the party to Worksop Priory Church, which was described by the Vicar, the Rev. H. T. Slodden. It consists of a fine rich Norman nave of eleven bays, with triforium and clearstory, and two western towers, all of which owe their preservation to the fact that the nave was the parish church. The eastern portion, which was the church of the Priory of Austin Canons founded here in 1103, has entirely disappeared, with the exception of a ruined thirteenth-century chapel, that formerly opened out of the south transept. Some remains of the western range of the monastic buildings are left, and the vaulted outer parlour now forms the vestry. All the old fittings of the church have disappeared, and, as was pointed out by Mr. Hope, a series of large square-headed windows in the south aisle, that lighted the parish choir and altar, were "restored" away by Sir Gilbert Scott in 1845. An alabaster effigy of a lady and two other mutilated figures of William Lord Furnival (*ob.* 1383) and Sir Thomas Nevil (+1406) lie on the floor in the western part of the nave, and might be taken better care of. A move was next made to the fine fourteenth-century gatehouse, a very complete example, with the "casual ward" for the lodging of tramps on the first floor. On the south side of the entrance a small and richly decorated chapel of curious construction has been added to contain some image of peculiar veneration. From existing sculptures of the Annunciation and of the Adoration of the Three Kings, the image was, perhaps, one of Our Lady. Other images of St. William (?), St. Cuthbert, and the Holy Trinity adorn the front of the gatehouse, before which stand the steps and part of the shaft of a cross.

After lunch the journey was resumed in carriages to Blyth, where the church was described by Mr. W. H. St. John Hope. It originally, he said, like the churches at Thurgarton and Worksop, formed part of a monastic church founded for Benedictine monks in 1088 by Roger de Builli as a cell of the Abbey of St. Katharine at Rouen, and owed its preservation, as in the other cases cited, to the fact that it served as the parish church, which was given as part of the endowment of the priory. The monastic part of the church had been utterly destroyed, but the nave and its aisles of seven bays remained, together with a western tower of later date. The nave and north aisle formed part of the first church of 1088, but a slight pause had occurred in the building, since the lower part of the north wall indicated a setting out that was not eventually followed, and the bays of the aisle were now oblong instead of square, as first planned. The early character of the work, in arcades, triforium, and clearstory, was pointed out, but the original flat ceiling of the nave had given place to a thirteenth-century quadripartite vault. The early Norman unribbed vault is left in the north aisle. The south aisle was replaced by another of greater width about 1290, with a wooden roof only, and to it the parish altar seems to have been transferred. The south porch was of the same date. Late in the fourteenth century a new tower was begun within the last bay of the nave, after the manner of that at Furness Abbey, but Mr. Hope said he could see no reason for its being so built here unless the old western boundary of the cemetery had then been close up to the church. The tower seems to have been slowly built by stages and not finished until well in the fifteenth century. Of the fittings the old wooden transverse screens remained, with painted figures of saints, and there were some good seventeenth-century pews at the west end. Several interesting floor slabs remain, and an early Purbeck marble effigy of a knight in flat topped helm with a lozengy shield and surcoat, perhaps a Fitzwilliam.

After a thorough inspection of so interesting a church the party returned to Worksop and thence by train to Nottingham.

In the evening the concluding meeting was held under the presidency of Sir Henry Howorth, when cordial votes of thanks were passed to all those who had contributed to the conspicuous success of the meeting of 1901.

Tuesday, the 30th, was devoted to the final expedition of the meeting. Leaving Nottingham by train at 9·25 a.m. for Aslockton, the members walked thence to Whatton church, where Mr. Montagu H. Hall, in the absence of the vicar, read a descriptive paper by the late vicar, the Rev. T. K. Hall. The church, which is dedicated in honour of St. John of Beverley, now consists of a chancel, central tower and spire, and nave with north and south aisles and porches. A south transept was destroyed in 1808, and the chancel was rebuilt in 1848 and the tower in 1870. The remainder of the building is chiefly fourteenth-century work. There are no old fittings except the font, which is of a curious local type, and dated 1662. The church contains some interesting monuments, which were described by Mr. Hope. The earliest is the effigy of Sir Richard de Whatton, known to antiquaries from the engraving by Stothard, but since restored. The next is an early fourteenth-century of a canon of Welbeck under an arch in the north aisle wall, and a third is a fine alabaster tomb with shields of arms in low relief (partly restored) and effigy of a knight of the Newmarch family *circa* 1380. There is also an incised slab to Thomas Cranmer, father of the Archbishop, who died in 1501. Some interesting fragments of the early effigies of another knight and his lady and of a fourteenth-century village cross with figures of saints are preserved in the north aisle.

The journey was next continued to Bottesford, past the village cross and the stocks and whipping post, to the parish church, the architectural history of which was described by Mr. E. B. S. Shepherd. It was, he said, a building with a complicated story, and appeared to have been built up by degrees in the fourteenth and fifteenth centuries round an earlier church, which it gradually replaced. The chancel had been rebuilt early in the thirteenth century with side chapels of two bays, which had since been destroyed. The fine and lofty tower and spire were of the fifteenth century. Mr. Hope described at length the unrivalled series of

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tombs filling the chancel, consisting of (1) a small Purbeck marble effigy of a knight that commemorated the heart burial of Robert Lord Ros at Croxton Abbey in 1285, (2 and 3) the alabaster tombs and effigies of William Lord Ros, K.G. (*ob.* 1414), and his son, John Lord Ros (*ob.* 1420-1), brought here from Belvoir Priory at its suppression; and (4 to 11) the monuments and effigies of the first eight Earls of Rutland and their countesses. There are also two good brasses to former rectors in the floor. The present rector, Canon Jackson, also contributed some historical remarks.

After luncheon the party drove on to Langar Church, an interesting building planned in the thirteenth century, though little of the original work remains. The chief features were described by Mr. Harold Brakspear, F.S.A., and Mr. Hope contributed some observations on the Choworth and Scrope tombs.

The party then journeyed on to Wiverton Hall, on the kind invitation of Mrs. Chaworth Musters, where Mr. Bailey described the ancient gatehouse incorporated in the modern house, all that remains of the mansion built in the reign of Henry VI.

Subsequently the party left for Bingham station and thence by train to Nottingham.

It will be seen that, although the great modern mansions in the Dukeries were not included in the meeting, nor the old home of the Byrons at Newstead Priory, most of the principal ecclesiastical buildings in Nottinghamshire were visited, and a special endeavour was made to include a typical series of the lesser-known churches which are apt to be overshadowed by the greater glories of the minster or ruined abbey. Owing to the dearth of old domestic work, Wollaton Hall was the only important Nottinghamshire house visited, Hardwick Hall being in Derbyshire. The most striking features about the churches are the late character of undoubted fourteenth-century work, and the abundance of monumental effigies, most of which are admirable examples of mediæval sculpture. The near proximity of the homes of the Chellaston "kervers" and the later "marblers" at Burton accounts for the large predominance of alabaster work.

THE CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

THIS society held its fifty-fifth annual meeting at Newtown, Montgomeryshire, during the week ending the 3rd inst. There was a smaller gathering of members, and the local residents participated less actively in the excursions than usual. Both circumstances, however, contributed to render the meeting more pleasurable and profitable to the antiquaries who were present, and minimised the difficulties that in practice always crop up in the management of an unwieldy party.

Newtown and neighbourhood for twenty miles round cannot be said to contain any single object of antiquarian interest of the first order, and, indeed, the same may be said of the county of Montgomery generally. Yet there exist within easy distance a number of minor objects that, by reason of their diversity, make the district an eminently suitable one for the operations of an archæological society; and it must be noted that these antiquarian delights are situated amid natural beauties hardly to be equalled, and certainly not surpassed, by those of any other district in the kingdom. The entire county consists of hills and dales, the former growing ever more imposing and the latter ever more romantic as the traveller passes onward from east to west. The Severn pursues a devious course through its central districts from its source upon the slopes of Plynlimmon to its disappearance as a Welsh stream a few miles beyond Montgomery, and wherever it is met between these extreme points its beauties are as fresh as they are varied. Then the woods of Montgomeryshire, what antiquary could resist their charm? Not collected here and there to constitute one of the distinctions of a nobleman's demesne, but scattered broadcast over the whole shire, and clustering most thickly along the slopes of the hills, they are a never-ending source of delight to the tired eye of a town resident. These manifold natural attractions are in many spots around Newtown disposed in such exquisite and harmonious combinations that the historical student is altogether tempted to forget the influence these physical features have exerted upon the rise and fall of tribes and races, and in the gradual evolution of the England and Wales of our own day. In no part of this island can the study of historical geography be more fruitfully followed than in the county of Montgomery.

The visitors commenced operations on Tuesday, July 30, by a drive to a spot now known as Gro Tumps, a short distance to the north-west of Newtown. This is an excellent specimen of the kind of defensive position formed of an artificial mound of earth, the base of which was surrounded by a deep moat. These mounds were, no doubt, crowned by wooden structures which the destructive agencies of time and man have effectually removed. The moats were flooded when a stream could be conveniently adapted for the pupose, or were left dry when water was not at hand. To these strong but circumscribed holds was attached a flat piece of ground varying in extent as the surface permitted, and surrounded by an earthern wall. The example seen by the archæologists at the outset of their journeyings was the signal for the outbreak of strong differences of opinion, which found frequent expression during the meeting, as to the builders of these structures and the consequent period of our history to which they belong. The late Mr. G. T. Clark examined many of them, and described most of those in the region around Newtown in an able paper, entitled "The Moated Mounds of the Upper Severn," printed in Vol. X. of "Montgomeryshire Collections." From both the architectural and the historical evidence, Mr. Clark came to the conclusion that this class of fortress was constructed by the Teutonic tribes whose amalgamation produced the general terms "England" and "English," and his conclusion has been received without hesitation as having the balance of probabilities in its favour. When advanced by the Ven. Archdeacon D. R. Thomas in an excellent paper upon the fortified posts of the district, read the evening after the visit to the Gro Tumps, Mr. Clark's conclusions were vigorously assailed by Colonel W. E. Morgan, R.E., of Swansea, author of "The Prehistoric Antiquities of Gower," and formerly Director of the Ordnance Survey of Wales, and by Mr. Romilly Allen, F.S.A. Both gentlemen argued ably in favour of the post-Norman origin of these structures. It is clear that the term "Saxon burh," which is frequently applied to them, conveys an inaccurate impression of their builders, for they are found in districts into which Teutonic tribes never penetrated in times to which the structures themselves may be considered as probably belonging. But it by no means follows that they must, therefore, be the work of the first Normans, though their easy adaptability for short sieges, and their usually favourable situation, would, no doubt, cause them to be utilised by that eminently practical people. The mound of Gro Tumps is 40 ft. in diameter at the summit, about 50 ft. in height, and between 140 and 150 yards in circumference at the base. The outer side of the moat was defended by an earthen wall. This earthwork is situated upon the Severn, whence water for the moat was drawn by means of a cross-cut. The bridging of the moat in these fortresses is not always easy of explanation owing to the absence of stonework, but the example seen by the party on this occasion seemed to offer a solution by the presence of a small mound on the outer side of the moat, upon which trunks of trees probably rested. The church of Bettws was the next point of call, and introduced the visitors to a typical example of a Powysland edifice. The churches of the district have for the most part been so ruthlessly restored within quite or comparatively recent periods that it is difficult for a visitor, without further evidence, to judge whether the restoration has followed and preserved the mediæval characteristics of the edifices. The general plan is of the simplest—an aisle and chancel marked off, in most instances, by no architectural division, and a squat western tower. This latter is most usually crowned by a short oaken structure, which in many instances follows and continues the external line of stonework, and is finished by a low roof; in other cases a little diversity is produced by imposing upon the first wooden structure a smaller one, also of oak, forming a true belfry. The exceeding plentifulness of wood and the relative absence of stone is the explanation of these peculiarities, but it is rather strange that greater elegance and grace was not reached in the external use of timber. These towers have, in the main, resisted the restorer; their great strength has kept them uninjured, and their want of height has preserved them from the accidents to which taller and more elaborate towers are subject. Though the church is dedicated to St. Beuno, a Celtic saint of the sixth century, the name Bettws marks it as having been once annexed to one of the great military orders—in this instance that of St. John of Jerusalem, which had a hospitalry at Halston on the Shropshire border. The church contains a brass commemorative of a former vicar, Sir John ap Meredyth, of Powys, who erected it in 1531, during his own lifetime. It is of poor character, but worthy of note as the only memorial of its kind in the entire county. Sufficient of the ancient glass has been worked into the modern windows to prove the superiority of the workmen of old. The parish chest, now inside the tower, has been made from a single oak; it is an example of the magnificent timber for which Montgomeryshire has always been famous, and of the absence of all artistic feeling in its maker. Upon a steep height commanding splendid views over a great stretch of country stands the ruins of Dolforwyn castle. The natural strength of the position no doubt caused it to be selected for the erection of a castle which should form an effective protection to the rich district between this spot and the Salopian plains. Possibly a castle may have risen here soon after Earl Roger of Montgomery had fastened his hold upon the district, but the ruins now visible are those of a fortress of the early thirteenth century. The ability and success of Llewelyn ap Iorwerth, the ablest political chieftain that Wales ever produced, and one of the signatories of Magna Charta, compelled the English barons on the marches, from the mouth of the Dee to the mouth of the Severn, to look to their strongholds. Earlier and more primitive castles, that had hitherto sufficed against the simple methods of warfare of the Welsh, were not sufficient defences against the modes of fighting which they soon learnt from their enemies. It is to this period that we must assign the construction of Dolforwyn Castle, of Dinas Bran near Llangollen, of Tretower, lower down the marchland, and of Grosmont and Skenfrith at the southern end of the Welsh border. During the reign of Henry the Third the Welsh made great advances in their struggle against the English. The latter had to fight hard to keep their ground, and it is to this reign therefore that the construction of the baronial castles along the border is to be attributed. The subjugation of the Welsh by Henry's son, the building of great concentric fortresses from Flint to Harlech, which were centres of political administration as well as impregnable seats of military power, and the growth of the royal resources coincidently with the decline of the baronial power, all contributed to the gradual decline in importance of the strictly baronial holds, and they seem to have been completely dismantled at an early period. Thus in 1387 this castle of the Mortimers is returned as "worth nothing," and in 1398 as "in ruins." So effectual has been the destruction that it is impossible to make out with any degree of certainty the principal parts of the edifice; nevertheless, it should not be missed by a visitor to Powysland.

Tregynon Church has been restored without taste or discretion, and may pass without further comment. Gregynog Hall, the residence of Sir James Joicey, M.P., who has recently acquired it from Lord Sudeley, is a fine residence containing in the dining-room, the only one seen by the party, some beautiful oaken carving, the old portion of which bears the date 1636 upon three heraldic shields. Llanwnog Church is of the usual Montgomeryshire type. Its claim to consideration arises from its possession of a rood screen and loft of beautiful workmanship. The church is undergoing restoration, so that it was difficult for the visitors to inspect this object with the care and attention it deserves. The carving is rich and executed with the greatest delicacy. The west front differs from the eastern face, but the whole is of the same period. It is a very fine example of good Perpendicular work. The window that about a century ago occupied the chancel is now in the north wall; the glass is of the late fifteenth century, and bears a representation of the patron saint attired as a mitred abbot, and with the inscription S'te Gwennoc. From this church the party proceeded to an interesting specimen of Montgomeryshire domestic architecture called Maesmawr, the residence of the now extinct

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family of Blayney. Owing to some misunderstanding the visitors were not admitted inside, but were forced to content themselves with admiring the exterior. Powysland is full of similar examples of black-and-white houses, and so many did the archæologists see that one whose *métier* lay in another direction expressed himself as sick of them. Their general plan is an adaptation to a timbered district of the Jacobean style of residence, the effect of the immense oaken beams which are painted black, and the intermediate spaces, which are filled with rubble and plastered white, being exceedingly pleasant.

On Wednesday the party made a toilsome journey to the scene of a defeat inflicted upon Henry III. by the Welsh at a spot called Cwm y Ddalfa, the glen of the capture, when William de Breos, one of the most turbulent barons of his day, was seized. The celebrated Hubert de Burgh, the Justiciar of England, started the erection of a strong fortress in the neighbourhood to curb the Welsh, but, according to the story told by Matthew Paris, was soon obliged to relinquish his design; whence King Henry III. satirically christened the half-built fortress Hubert's Folly. After climbing to the supposed site of the castle, called Pen y Castell, the tired archæologists unanimously agreed with the king. Continuing their walk they arrived at the spot termed the Moat, in the immediate vicinity of Kerry Church. This is a fine example of the moated mound, and produced a recrudescence of the discussion of the preceding day. Kerry Church is the scene of one of the most interesting incidents of mediæval ecclesiastical life of which we have authentic information, namely, the contest in 1176 between the Bishop of St. Asaph on the one hand and the celebrated Giraldus Cambrensis for his diocesan, the Bishop of St. David's, on the other, for the right of visitation and patronage. The full story of the mutual excommunications pronounced by the respective dignitaries upon the other, the triumph of Giraldus, which he celebrated by ordering the ringing of the bells, "*simul omnes trine intervallo*," whatever that may precisely mean, are they not related at length in the works and words of the victor? Time and the spirit of compromise have so far adjusted the matter that the church is now attached to the diocese of St. Asaph, though the more solid advantages of appointment still lie with the Bishop of St. David's. The very edifice that was the occasion of the quarrel may be traced in the larger building of to-day. The church consists of nave and chancel and north aisle, divided by eight rounded arches. The four westernmost piers of this arcade are of the Norman period of architecture; the arch springs directly out of the pier and has a simple chamfer. At a later period the church was lengthened to the eastward by the construction of other four arcades. The piers of these arches are octagonal, and are finished off with cushion capitals; the third pillar from the eastern end also bears the ball-flower ornament, and the mouldings of the capitals of the two easternmost piers are more elaborate than the rest. The round arch of the earlier arcade was continued in the later enlargement. The chancel consists of the four easternmost bays of the south aisle, and in the south wall is a piscina of the period of this addition to the original church. The font, which is also of the same date, is octagonal in shape and bears upon its several faces the emblems of the Passion. The windows are modern. There is a western tower, with the usual timbered belfry, and buttresses of the Late Decorated period, but these have been much altered in character at a considerably later period. One of the bells bears the inscription "Sancte Egevire ora pro nobis," though the church is dedicated to St. Michael. The patron saint of Penstrowed, originally believed to have been the mother-church of Kerry, is Gwrie, and it was suggested by Archdeacon Thomas that the form upon the bell is derived from that of the original saint of the entire district. The parish registers commence in 1609. There are monumental slabs to various members of the allied families of Herbert and Long, from the latter of which is descended the Right Hon. Walter Long, who was born at Dolforgan in this parish. After luncheon the party proceeded by train to Welshpool to visit Powis Castle, the Castell Coch or Red Castle of the Welsh chronicles. Architecturally Powis Castle was so completely altered in the seventeenth century that its original features are now confined to the western towers which guarded the entrance into the mediæval castle. There are a few good pictures, and the view from the terrace is superb. Welshpool Church is a spacious edifice, and, though restored within recent years, it still retains the side galleries so dear to the eighteenth century. The nave is of great width, the chancel arch not reaching the southern angle by many feet. A south aisle was added about two centuries ago, no doubt when the galleries were erected. The western tower is heavy and poor in character. Welshpool possesses a small but interesting museum which is now undergoing arrangement by Professor Boyd Dawkins. It contains several carved capitals of Early English design from the dismantled abbey of Strata Marcella a few miles distant, but its principal treasure is an early sanctus bell of what is known as the Celtic type which once belonged to the church of Llangwstenin. The controversy on the pre-Norman or post-Norman date of the moated mounds broke out afresh on a visit to the Tomen (mound), a fine mound, the base court of which has been transformed into a most perfect and restful piece of green turf on which the game of bowls is played.

Thursday saw a visit to another moat, this example being upon the slope of the hills in the parish of Llandinam. It is peculiar by reason that in addition to the usual base court it has a larger enclosure opening out of the first court. This may have been a British camp to which a subsequent race of invaders added one of their own type of structures. To antiquaries desirous of studying this branch of archæology no better example can be chosen than the one here referred to, and it has the merit of accessibility, being only a few minutes walk from the railway junction to which it has given its name of Moat-lane. With the exception of the edifice which occupied its summit, it must be in almost the same condition as when it was first constructed; the moat is well defined and still contains some water, and the base court and outer enclosure are easily traceable. Llandinam Church has been so thoroughly restored as to present in its structure few objects of interest to the ecclesiastical antiquary. The ancient font, which has found safety in a retired corner, though terribly mutilated, bears sufficient evidence of its Late Norman date. A carved wooden reredos of sixteenth century workmanship is preserved in the church. It is divided into five compartments, the centre panel representing the temptation of Adam and Eve, and the remaining panels having respectively on the left the angel and the lion, and on the right the bull and the eagle, the figures emblematic of the Evangelists. Llanidloes church, which was next visited, burst with the effect of a revelation upon the astonished visitors. Here, in a retired district of Wales, is a parish church that must always have been far too large for the population. Not only so, but the edifice internally is one of the most beautiful in the Principality. It consists of a nave of five bays, a finely proportioned chancel, and a north aisle. The great feature of the building is the imposing arcade of Late Transitional work, developing at the western end into pure Early English, which divides the nave from the aisle. The piers are clustered and have the keel moulding, and were it not for a certain stiffness in the carving of the capitals might be considered a little later in date than they probably are. There has long existed a tradition that this arcading was brought from the Cistercian abbey of Cwmhir about 20 miles distant, at or soon after the dissolution of that monastery in 1536, and after a careful comparison of the fragments still remaining at that place with the work at Llanidloes church, the late Mr. S. W. Williams, F.R.I.B.A., felt no hesitation upon the matter. The timbered roof is also said to have come from Abbey Cwmhir, but as the spans of the two buildings varied considerably this conjecture is certainly erroneous. It is more probable that the people of Llanidloes, having acquired a beautiful arcading for their church, determined to reroof the building at the time when the arcades were erected. The beams are terminated by large shields, one of which bears the date 1542, which would fit in with the hypothesis just advanced. The church is under the invocation of St. Idloes. The north aisle was once decorated with mural paintings, of which not a trace now remains. The corbels supporting the wall-plates are formed of three conjoined billets, but the westernmost four are of exquisitely carved foliage. The east window is a good example of the Perpendicular period; the windows on the northern side are later, and chiefly square-headed. The tower, as is customary, is at the western end, and is of the local type crowned with a wooden belfry. It batters considerably, and is buttressed at the angles. The string course is carried round the west door as a label. The tower may have been higher than the usual Montgomeryshire examples, indications of a second stage being visible about 6 ft. from the top of the present stonework. The arch leading from the interior into the nave is lofty and pointed. The font, after having been missing for many years, was discovered not long ago in a heap of rubbish and placed upon a modern base; it is octagonal in shape and ornamented with four circles within a larger circle upon each face. It is of the Early English period. A helmet of the sixteenth century is supported on a bracket fixed to the western end of the nave. The time occupied in the examination of the church compelled the party to give only a cursory glance at the old Town Hall, a black-and-white structure of the early seventeenth century. On the homeward journey a stiff climb was undertaken to the summit of a hill called Cefn Carnedd, upon which are the remains of a fine British camp. The surrounding wall of the camp follows the outline of the hill, the area enclosed being about twenty acres. There were no remains of dwellings within the camp, as is usually the case in the stone enclosed camps of which Carn Goch and Tre'r Ceiri are notable examples, nor were there any indications of the presence of water. It would appear, therefore, that these camps were only used as posts to which a tribe could, with its cattle, retire when attacked by a superior force. The final halt upon a long and fatiguing day was called at Caersws, said to be the site of a Roman station. Though no mention of such a station occurs in the Itinerary, there can be little doubt of the presence of the Romans at this spot. Traces of a square enclosure with rounded corners are plainly visible close to the present railway station, and it is said that during the construction of the railway buildings a quantity of Roman pottery and tiling was discovered. Trifling excavations were made about half a century ago with similar results, and small finds are frequently reported. Influenced by the projected visit of the Cambrian Archæological Association to the neighbourhood of Caersws, the Powysland club determined to make a few trial diggings under the direction of Dr. E. Davies Rees, but the spots were ill chosen, or the fates were unpropitious, for nothing has yet been discovered. Simultaneously, however, with this work, the digging of the foundations for a new house, distant about 100 yards from the line of the camp, was proceeding, and here a large quantity of broken Samian and Upchurch ware was unearthed, together with broken amphoræ and other unmistakable signs of Roman occupancy. Several coins turned up, one of the reign of Vespasian. In the centre of the excavated space a well was discovered completely choked with rubbish. The walling of the well is inferior to that of genuine Roman work, and the greater probability is that it is the construction of the British tribe which entered upon the Roman heritage after the withdrawal of the legions. Caersws seems to be the point of convergence for four or five roads having Roman characteristics, and commands the entrance to several valleys. But the absence of inscriptions forbids the idea that the camp, if it ever really existed, was anything more than a temporary fortification thrown up most probably during the operations against the Ordovices, and abandoned as a military post after the submission of that tribe. On the other hand, there seems no room for doubt that a small colony of Roman civil officials had been planted and continued to reside here until towards the close of the Roman domination. The neighbouring lead mines of Trefeglwys would be almost certainly known to them, and they were much too practical to neglect their development. Cambrian antiquaries cannot be expected to be experts upon the Roman period. The Roman stations in Wales, with the exception of Caerleon, were few and insignificant, and their destruction in subsequent times appears to have been so complete that little has been left to reward the labours and widen the knowledge of the Welsh archæologist. It would therefore appear to be desirable that such an authority as Mr. Haverfield should be consulted upon the finds already brought together by Dr.

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Davies Rees before further excavations are attempted.

On Friday the party made an excursion round Newtown, proceeding first to the ruins of the old parish church, beautifully placed on the banks of the Severn. The eastern and western ends, the southern wall, and the western tower are still standing, and sufficiently proclaim it to have been another instance of the local type. It appears, however, to have dated in part from an earlier period than most of the neighbouring churches, and it may well have been the pattern from which surrounding parishes derived their form of edifice. Richard Owen, the social reformer, was born at Newtown, and lies buried here. The very name Newtown postulates the existence of an older community, and history informs us that this earlier settlement was called Llanfair in Kedewen. The town became subject to the great border family of Mortimer, successive members of which fostered its progress by granting important municipal privileges to it at various times. These, most probably, called a new town into existence after complete quietness had been assured upon the Welsh border by the power of Edward I., for we find in a Charter of that King of the year 1321 the style changed into "the new town in Kedewen." The old church just mentioned had possessed a beautiful oaken screen, which, upon the desertion of the church about thirty years ago, fell upon evil days. After much hacking about, part of it was re-erected in the new edifice that had been built at the other end of the town, where it proved offensive to the æsthetic taste of the parishioners. It was again removed, and relegated to a cellar in the vicarage, whence it was disinterred for the inspection of the visitors. The modern church is by the late Mr. Penson. The party next started upon the drive to Montgomery. The Severn is here a gently-murmuring stream, having the highway as companion through the beautiful low-lying ground. Several places of historic fame were passed in the course of the drive, such as the Ford of Rhyd Whiman, a favourite spot for the solemn settlement of disputes between the English kings and the Welsh princes; and, further on, the Ford of Rhyd-y-Gors, the scene of a great Saxon defeat by Gruffudd ap Llewelyn, in 1037, concerning the locale of which Mr. Freeman has made a sad error in his "Norman Conquest." The party soon crossed Offa's Dyke, which in this neighbourhood is easily traceable, and at Chirbury found themselves on English soil. Chirbury is the site of an Augustinian priory, of which almost every vestige has vanished except the nave of the priory church, which, being parochial, was consequently saved from the general destruction. The work of obliteration was so effectively performed at Chirbury that there are now no church records, no parochial terrier, and, so the visitors were informed, scarcely any documents relating to the priory in the British Museum or Record Office. The modern parish council finished what their forbears had accidentally spared, for upon the establishment of the first council and the handing over of the parish books, they were ordered to be destroyed as worthless. The present building consists of nave and aisles, being without doubt the priory church cut off short of the crossing. The period is Early English. The original east window, which is placed in a shallow chancel erected in the eighteenth century, is formed of three plain lancets, and at the western end of the south aisle is a pair of lancets of plain but effective work. The piers of the nave are much out of the perpendicular, but the roof timbers have been secured by iron ties. There is a fine western tower crowned by a timber balustrading. The font is curious; it is circular in shape, with two projections on opposite sides which appear to have been intended as handles; at equal distances between these projections are two others of different character. The chalice, dated 1595, is a very good specimen of the communion service of the period; the cup is of enormous size, of much later date, and the paten is of the late seventeenth century. Portions of the dismantled priory are built into the churchyard walls, and the lower part of a beautiful clustered column, which appears to remain *in situ*, would probably be found to mark the northern transept of the conventual church. A number of mediæval tiles discovered at various periods have been fixed in the porch of a neighbouring house, but though protected by a mat, they should be removed from the many chances of destruction which beset them. A fine library of chained books, which may possibly have been formed in the latter years of the priory, and which was certainly enlarged by the early Protestant vicars, is now at the vicarage. Chirbury is, of course, for ever associated with the sainted Lord Herbert. Lymore is a house about a mile from the town of Montgomery of interest to antiquaries as presenting an example of seventeenth-century black-and-white domestic architecture which has escaped internal renovation or alteration. It has been described and illustrated in an early volume of "Montgomeryshire Collections." Several of the rooms still contain the tapestry with which their walls were covered when the house was in the heyday of its glory. It is the property of Lord Powis, and is maintained as a shooting-box. Montgomery possesses attractions for all sorts and conditions of antiquaries, its stock of show places being so varied as to present examples of the fortified structures of three distinct epochs. Its strategical importance early recommended it to the race which, for better name, we may continue to call the Ancient Briton. The people who built the camps on the tops of the rounded hills of this district and enclosed them with earthen walls must have recognised the suitability of the height now called Ffridd Faldwin for the purposes of a defensive post. They accordingly established one there, whence its masters must have long dominated the surrounding country. Later on came the people whose chieftain favoured the conical mound, the deep enclosing trench, and the outer courtyard. This structure is on a gentle eminence, far below the Briton's breezy camp, yet with a prospect extending many miles in each direction that would remove the danger of a surprise. Next came the builder of the strong stone tower and the scientifically constructed stone wall. Disdaining the sites of his predecessors, he fixed upon a hill intermediate in height between the two. Montgomery appears in Domesday (A.D. 1086) as a castellum. Does this refer to the moated mound, or had Earl Roger of Shrewsbury already commenced operations in masonry? Could we but answer this apparently simple question, we should have gone far towards the settlement of the much-debated problem of the period of the moated mounds. We can at any rate say with confidence that if Earl Roger had selected the site of the present castle and had built his keep ere Domesday was compiled, one of his successors or vassals started afresh in the reign of Henry III. at the structure, the ruins of which exist at this day. The restricted space at the top of the hill was levelled and enlarged by the construction of walls of solid masonry on the sides where the hill fell sharply away. The entrance to the castle was to the north-west, the only direction from which it could be attacked, and a strong keep rose on the northern scarp a few yards from the gateway towers. Beyond this it is impossible to make out the features of the structure, there remaining little else than immense mounds of broken and shapeless masonry. Traces of the outer defences can be observed following the slope of the ground. The final object of the visitors attention was the church of Montgomery, which must have been erected coterminously with or directly after the castle. It consists of nave, chancel, and north and south transepts. The work is of the early thirteenth century, and, though plain, exceedingly good of its kind. A single-light window in the south transept is especially noteworthy, it having light and graceful shafts with capitals, whereas all the other windows of the same period have only the usual rounded and unbroken moulding. The eastern window is good Perpendicular. There is a screen of not very good workmanship which is said to have come from Chirbury Priory. The tower is at the crossing, and is of the massive Llanbadarn Fawr type. Two effigies are preserved within the church, one of a knight of about the close of the thirteenth century, the other a knight of about a hundred years later. There is also the tomb of a Herbert who died in 1600, in the monstrous style of that period.

Small as was the attendance, the present year's meeting was one of the most interesting of the Society's recent fixtures. The programme of work was found too long, and items had to be sacrificed each day. This is so common a fault in the arrangement of such gatherings that expostulation seems useless; it has the humanitarian excuse that it spares the long-suffering horses, and brings the travellers back to dinner at reasonable hours. The address of the president for the year, Lieut.-Col. E. Pryce-Jones, M.P., was a model of what such occasions should produce from gentlemen who do not profess to be themselves learned in the archæology of their district. Nothing could exceed the courtesy of the local honorary secretaries, Mr. R. Williams, F.R.Hist.S., and Mr. Pryce Wilson Jones, nor the general excellence of their management. The hospitality of the gentry of the county of Montgomery is well known to every visitor to the county; it was displayed to an even greater extent than usual towards the party of antiquaries, and was accompanied by such genuine kindness and consideration as to double the gratification of its recipients. Three papers were presented to the evening meetings, one by the Ven. Archdeacon of Montgomery upon the camps and fortified posts of the county, which produced the interesting discussion already referred to; the second by Mr. R. Williams, F.R.Hist.S., on "Dolforwyn Castle"; the third on "Wanten Dyke," by Mr. J. M. E. Lloyd. Perfect weather accompanied the party throughout, and contributed not a little to the complete success of the meeting. There is but one subject upon which a grumble is fairly admissible, and for which the permanent officers of the Association are solely responsible. The members who make it a point of attending the annual meetings are occasionally presented with a programme of the particular district in which they happen to meet that is not only a guide to the antiquities of the district and a compendium of information respecting hotels, trains, postal business, and the like, but is of permanent value to the inhabitants. At other times they receive nothing beyond a meagre list of the places to be visited. The present occasion happened to be the turn for one of the latter productions. Members visiting Newtown for the first time had to find out as best they could the names of hotels, and a few of them who had been unable to procure this local information were doomed to wander from house to house in search of shelter. The programme was accompanied by a sketch-map which was worse than useless, for it was not furnished with a scale of distances. Such a programme is unworthy of the committee of the Association, and, it is to be hoped, will never be repeated.

SANATORIA FOR CONSUMPTIVES.

STATED shortly, the *raison d'être* of a consumptive sanatorium is to provide a centre constructed on the latest hygienic principles, where advantage is taken to the fullest extent of sun and air, to teach the temporary occupants to adequately appreciate these blessings, and so to regulate their lives that they may go forth as apostles of health, carrying their knowledge into their various family circles.

The movement for what is called the open-air treatment of tuberculosis patients has been extensively practised in Germany for many years. As long ago as 1859 a sanatorium was erected in Silesia, at Gorbersdorf, and since then the various German States and insurance boards have actively entered into the scheme, and numerous sanatoria have been erected. Some are in the nature of hospitals, adopting as *part* of their treatment open-air living. Others are in the nature of homes where patients in the earliest stages of consumption are received, and open-air living is the *primary* treatment, seconded by regular discipline in hours of rising from bed, of eating, and retiring to rest, by bathing, by graduated exercise—in short, by living on hygienic lines.

It may be convenient to lay down the main lines on which a sanatorium should be constructed, and in this connexion it is to be borne in mind that it is recognised by nearly all medical men that to get anything like satisfactory results, patients should be admitted in the first stage of the disease. In fact, cures appear to be an inverse ratio to the duration of the disease. We will, therefore, assume that patients enter the sanatorium when first attacked. They are not then incapable of moderate exercise, nor are they expected to be confined to their beds. Of course it may be that temporarily they are weak, and that rest in bed may be necessary for a time.

First as to site. A sandy subsoil should be selected, so that rain may be readily absorbed.

* A paper read at the recent meeting of the British Congress on Tuberculosis, by Mr. Edwin T. Hall, F.R.I.B.A.

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Clay is relatively impervious, and a soil with clay not far from the surface gets waterlogged. Evaporation creates ground mists or fogs, which are very bad for consumptives. Again, a low-lying site on sand or gravel is bad, because the subsoil water percolates through the subsoil, and renders the earth moist and cold. This percolation also forces outwards ground air or air charged with carbonic acid gas, a slow poison. The site should, therefore, be elevated, but not on the summit of a hill. The ideal site is the southern slope of a hill sheltered from north and east winds by trees. On sandy soil the trees will generally be some species of pine, the resinous exudation from which is health-giving, imparting a clean and brisk flavour to the air. It is sometimes held that the near presence of sheets of water is objectionable; but that, I think, only applies to ponds and semi-stagnant waters. A rapid river may be beneficial, owing to the exchange of air to which its movements give rise. Witness the case of Nordrach in the Black Forest, where the Harmerbach, coming from the higher lands, passes through the village, close to some of the buildings of Dr. Walther's Colony; or again Harlaching, near Munich, standing on a hill above the torrential Eiser. The life and movement of such waters has a bracing and energising influence on humanity, whether sound or sick.

Given, then, a site on sandy subsoil amid pines, the next thing is to place the sanatorium in an elevated position. It is not good to put it on a flat plain. Shut in by woods, with a strictly limited prospect, the influence on a patient is bad. There is a sense of confinement most depressing to all nervous temperaments. Hohenhonef, not far from Cologne, is high up the mountain, with beautiful and very extensive views of and beyond the Rhine. Nuremberg-Engelthal, in Bavaria, commands a wide stretch of scenery. From Falkenstein, in the Taunus mountains at Cronberg, near Frankfort, the panorama is only limited by power of sight. Dr. Walters' Sanatorium at Crookesbury Ridges, in Surrey, has in a less elevated position also extensive views. Again, there should be a wide clearing on the south side of the building, and in a less degree on the other sides. Admit to building and to gardens plenty of sunlight. The curative value of sunlight, with its germ-destroying power, is immeasurable. The clearing, too, gives the sense of freedom and lack of restraint. The charm of the seaside is largely the gratification of this sense. Another point of great value is to set the building well away from a high road, and in a sandy district this is of especial importance. Dust of any kind is, of course, very bad for affections of the throat or respiratory organs, and the dust from a high road, laden, as it is liable to be, with fœcal matter, and carried about by high winds, is worse than all. Of course, a good water supply is essential. Where a public service is not available, a well should be sunk on the higher side of the sanatorium. It will there not be in danger of contamination from sewage, and, also, once raised to the surface, the water will flow by gravitation to the building—a great saving in expense of maintenance.

Sewage purification and disposal are important matters. I found among the South German institutions—both sanatoria and general hospitals—that it was the common practise to treat the sewage with an infusion of sulphur earth, a natural product of which, I believe, there are considerable deposits near Cologne. The mixing was a very simple process. At Falkenstein the mixture was contained in a closed vessel placed in the outlet chamber of a divided sewage receiving tank. The inlet chamber received the sewage, from which by a screen or tray, paper, &c., was separated. This chamber, at a certain level, emptied itself by a siphon. To the top of this siphon a small pipe from the mixture vessel was attached, and as the sewage passed it drew a charge of the mixture by suction. The effluent was then conveyed from the second chamber to another receiving tank at a distance divided into two chambers, and ultimately to four settling tanks, used in rotation, and after a period ranging from two to four weeks, the liquid was discharged on to the land.

At the Nuremberg General Hospital, which is quite new, a more elaborate apparatus is used. The main drains discharge into a cesspool or receiver, with an outlet trough at the level of the inlet pipe. This trough discharges on to a species of water wheel contained in the central of three open brick tanks. The two side tanks contain the sulphur earth mixture, kept in a state of agitation to prevent precipitation. The rotation of the wheel is arrested as the bucket comes into position under the trough and is filling. While the filling is going on two small streams of the sulphur earth mixture flow in from the sides. The treated sewage then passes over a weir to a channel, with an iron screen over it to catch foreign substances, and thence to two large circular settling-tanks, intended to be used alternately, with funnel-shaped bottoms about seven metres deep in all. Suction-pipes are fixed to near the bottom of these tanks, and the heavier deposit is pumped up to a hydraulic press when the sewage is formed into cakes to be carted away for manure. The liquid from the tanks passes away.

At Harlaching, after similar treatment with sulphur earth, the sewage passes into the rapid Eiser, and I am told all the sewage of Munich passes into the river without ill effects, owing, I suppose, to the tremendous current.

A Nordrach the sewage goes into the ordinary closed cesspool. When this gets full it is emptied by means of a portable enclosed apparatus, probably known to many officers of health and sanitary engineers. Briefly described, this is a cylindrical closed tank, mounted on cart wheels, with a long flexible suction-hose. When the suction-pipe has been let down to the bottom of the cesspool, a charge of chemical explosive expels the air from the cylinder through a valve, and the vacuum is immediately filled with sewage. This is carted away and spread over the land.

I did not hear of any case in South Germany where a septic tank treatment was adopted. In the new sanatorium at Wokingham, in Surrey, there is a septic tank with two or three settling tanks attached, and from these the effluent passes on to the land. Where the sewage can be delivered into a public sewer there appears to be no medical objection to its doing so without treatment. In London the sewage of the large scarlet fever and diphtheria hospitals so passes, and no evil results follow, as was conclusively proved by a Local Government Board Commission.

The great danger from consumption appears to arise from bacilli contained in sputum. When the moisture evaporates these bacilli are blown about and become a source of danger. In all sanatoria provision should be made for dealing with sputum by cremation. At Nordrach each bedroom is fitted with a pair of lavatory basins—one for washing, the other for spitting. It seems to me the waste pipes of the latter must become contaminated, and in any case I do not like the idea of sputum passing into a pipe.

Having now dealt with these general features, we come to a consideration of typical sanatorium buildings.

It will be noted that all that I submit to your notice differ radically in planning. Unless otherwise mentioned, all the German institutions have double casement windows, are heated by low-pressure steam radiators, and are electrically lighted. In some of the latest institutions, as Harlaching and Krailing, the administrative buildings are separate and distinct from those containing patients, but not so in others nor in earlier ones. For example, at Falkenstein, which is the first institution I propose to describe, the kitchens, larders, &c., are in the basement of the block. It must, however, be borne in mind that this institution commenced in what had been a private house, and although by additions it is now a large place, the original house remains part of it. The staff, except the medical men, live in the block.

It will be seen by the general plan that there are detached blocks. Engine and boiler houses, stables for horses and cows, workshops, laundry, &c. The main building, containing a basement and three floors above, one of which is in the roof, consists of a centre block facing E.S.E., with two symmetrical wings at a slightly obtuse angle, enclosing on three sides a terrace garden. To the N.E. is a very large dining-hall opening on the S.S.E. to a wide verandah continued in a N.E. direction to the chief doctor's house, and forming a covered promenade about 65 metres, or, say, 200 ft. long. On the south side a long annexe, with an enclosed verandah or gallery facing west, leads to another doctor's house containing the consulting-rooms, &c. On the east side of the gallery are the gardener's house, mortuary, &c. The total frontage in a straight line measures about 1,000 ft. The sanatorium has accommodation for one hundred and twenty patients of either sex, with seventy single and twenty-five double bedrooms, generally of a large cubic capacity. There are three main staircases. The staff consists of a medical superintendent with three assistants, a managerial staff of four. The total staff, male and female, indoor and out, is ninety-two. There is one waiter to eight or ten patients. There is no regular staff of nurses and no separate accommodation for them. They are only taken in if required by patients. The patients' rooms generally face south or east, but others north and south-west; the majority are in single file on one side of a corridor, but there are several rooms on the other side. There are two slipper baths for patients and a douche-room in the basement. The water-closets are contained in the building. The floors of bedrooms are covered with linoleum; the walls are plastered. There are no rounded angles. The ventilation is by the windows.

The *liegehallen* are attached to the building, forming wide verandahs on the three sides of the terrace at the level of the basement floor, which is above ground on this side. In the grounds there are large open pavilions and smaller summer-houses containing couches, all fancifully and luxuriously appointed, and in the building are winter garden, reading, writing, billiard, and music rooms. Altogether this is a high-class residence, medically conducted, where wealthy patients may live cheerful lives in beautiful air and glorious scenery. It may be worth noting that each patient's serviette is kept in a linen envelope—claimed as a very sanitary arrangement.

Ruppertshain, a few miles distant, near Konigstein, is modern, is for poorer patients, and is more strictly a sanatorium. It is on plan a flat crescent three stories in height, above a basement with two short wings, and accommodates 122 patients—ninety male, thirty-two female. There are no separate administrative buildings, but the kitchen is in the west wing, on the ground floor. There are eighteen rooms with one bed, seventeen with four beds, and six with six beds, of a cubic capacity per patient, for men, of 20 to 30 metres, and for women, of 30 to 40 metres. The staff consists of the medical superintendent, with two assistants, a secretary, and a lady superintendent or matron. There are three female and two male nurses, and twenty-four male and female servants. There are two main staircases from bottom to top. The patients' rooms face south and are in single file, with a corridor on the north side. There are nine slipper baths for the patients and one douche for each sex, all in the body of the building. The floors of bedrooms are of plain uncovered deal boards; the walls and ceilings are of plaster. In the older portion of the building there are no concave angles to the rooms, but in that most recently built all angles are concave except at the floor, where they are most needed. At the ends of the building there are two-storied *liegehallen*, about 12 ft. wide. There are no fireplaces, and the ventilation is by the windows and doors. One of the medical officers, who courteously showed me over the institution, was of opinion that wards with as many as six beds were not so good as those with only two or three. He thinks a few balconies to bedrooms, large enough to take beds, are desirable.

The Nürnberg Heilstätte, Engelthal, a few miles from Henferfeld, is a modern building—a parallelogram consisting of basement, three other floors and then rooms on the gables. There is no separate administrative block of buildings. It affords accommodation for fifty patients in seventeen rooms, two containing five beds, two with one bed, the others having three beds each. The cubic capacity per patient is 40 metres. There is one staircase, which is not sufficient for so high a building with so many residents. All patients' rooms face south, and have a corridor on the north side. Dr. Bauer is the medical superintendent, and has no assistant. There are three female nurses and seven female servants. There are four slipper baths and three douches, all in the body of the building. There are six water-closets for patients, similarly placed. A handsome dining-room faces south, and is served from the kitchen in the basement. The floors are of uncovered deal boards. Walls and ceilings are of plaster and have concave angles, except at floor, which omission the doctor laments. The plastered surfaces are artistically decorated, a feature which I commend to the notice of our hospital authorities. The *liegehallen* are quite detached, one being on the

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terrace at the south-west of the sanatorium, the other in the woods. Ventilation is by windows and doors. Dr. Bauer thinks it better not to have more than three beds in a room.

I should like to mention the great attention paid to the details of furnishing in this institution. The bedsteads are simple in manufacture, having footboards of iron covered with linoleum, with spring mattresses. The bed mattress is filled with Kapock, an Indian fibrous material of which Dr. Bauer speaks well. The bedside tables are of zinc, enamelled, with glass tops, and zinc drawers, having rounded ends for cleanliness. In these the soap trays, tooth brushes, &c., are kept. The centre tables in the wards have ash tops unvarnished, and the legs and framework are of varnished deal. There are no drawers to them.

The next building I propose to describe is one of quite another type of plan.

The Städtisches Sanatorium at Harlaching is a few miles' drive from Munich, on the top of a hill, in a fir forest. This building may be described as a hospital. It is primarily for consumptives, but a few other cases of non-infectious character are received. They also make a speciality of dental surgery, and the dental operating room is fitted with every kind of the most modern dental appliances. Accommodation is provided for 212 patients, half of each sex, but the ultimate scheme is to add buildings so as to accommodate 600 patients. Dr. Hermann is the medical superintendent, and there are three assistant medical officers. The remaining staff consists of a manager, a legal clerk, a clerk, and one matron. There are twenty-one female nurses (members of a sisterhood), two male attendants. Of servants there are nine female and eight male, including engineering staff. The hospital is a building E-shaped on plan, three stories in height, with, I am glad to say, no basement rooms. Its main entrance frontage is towards the north. There are twenty-eight wards, six with twenty beds, six with twelve beds, twelve with single beds, and eight isolation rooms, each with one bed, but I think some of these last-named are appropriated for three-bed wards. The cubic capacity per patient is 36·36 metres. There are four staircases, two in the centre and one at each end, and one lift. The windows reach nearly to the ceiling. There are twelve slipper baths and three douches, two slipper and one douche at each extreme angle, all contained in one room divided by partitions. There are eighteen water-closets for patients, badly arranged, each group of three with a slop sink being placed in one room, in the body of the building, with only one window. It is surprising to find such an arrangement in these modern buildings—an arrangement which the medical superintendents all condemn and lament.

The aspect of the wards is as follows:—The twenty-bed wards are axially east and west, with windows north and south. On the south side of the wards, three stories high, are the *liegehallen*, about 12 ft. wide. Dr. Hermann thinks these are very conveniently placed, but too wide, and owing to the fact that they are of solid masonry, arcuated on each floor, they keep off too much sun. Had they been 9 ft. wide with pillar construction they would, he thinks, have been admirable. There are other *liegehallen* in the grounds. The twelve-bed wards are north and south, with windows east and west. The single-bed wards face east or west respectively, the isolation rooms north. The floors of the wards are of concrete covered with linoleum. Walls and ceilings are plastered. No angles are rounded, a fact of which the doctor complains. Ventilation, when windows are closed, is by means of warmed air inlet and by outlet shafts. Time is too short to allow me to describe these in detail. The fresh air is warmed by passing through a case containing a steam radiator, but Dr. Hermann complains that the air so heated is too dry. To me this statement was interesting, because I have always had this objection to steam radiators for heating such inlets. The same result does not arise when hot water is used.

The lighting is by electricity, and all the clocks are electric. The day accommodation for patients is excellent. There are two adjacent dining-rooms in the centre for each sex, looking into the large quadrangles, and a reading-room to the south of these. There are two handsome chapels, one for Roman Catholics, one for Protestants.

The administrative block is north of the anatorium. It is said to be sufficient for the ultimate scheme. The plan is very complete and admirable. There are, however, two points I venture to criticise, and these are:—(1) placing the linen drying-rooms over the washhouse and finishing-room; (2) placing the disinfector in the basement of the main block. The plan of the whole is a hollow square surrounding an open quadrangle. The south block contains the doctor's and priest's residences. On the south-west is the laundry; on the south-east are the kitchen, with dining-rooms attached, for female staff, the residences of the assistant-matrons and nursing sisters. The west side contains the residence of the manager, servants, and engineer; and to the north of these the cow and pig stables, poultry house, &c., with fodder-lofts above. The east side contains the stables, coachhouse, &c. The boiler-house and engineer's department are in the centre of the quad. The rest of the basement contains heating apparatus, disinfector, and very extensive cellarage. The cow-stable is a regular feature at most of the sanatoria, and those I have seen are beautifully kept. The importance of pure milk is evidently fully recognised. I quit the description of this institution with regret. One of the most modern consumption hospitals visited by me, I found it to be full of interest in all kinds of detail, and the many hours Dr. Hermonn kindly gave up to explaining everything are amongst my most pleasant recollections.

We turn to yet another type of plan in the Volksheilstätte Krailing, about half an hour's walk from Planegg, in Bavaria. The whole district is a forest, principally of pines, and the Volksheilstätte is beautifully placed, and seems the ideal abode of rest and seclusion. This is strictly a sanatorium for open-air treatment of men only. It receives 120 patients. Dr. Krebs is the chief medical officer. He has two assistants. The matron does the correspondence, otherwise the institution is managed from Munich. There are twelve nursing sisters and three male attendants. There are twenty-one servants in all, male and female. The sanatorium contains a basement and three other stories. It consists of a central block with two wings at widely obtuse angles, and at the south-east and south-west intersections there are pretty chapels for Roman Catholics and Protestants respectively. There are three patients' rooms containing 109 beds; thirteen rooms have single beds, fourteen have two beds, six have three beds, two have four beds, six have five, and two have six; but 120 patients can be accommodated if necessary. The cubic space in single bedrooms is fifty metres, in other rooms from thirty to thirty-three metres per patient. There are two staircases. The doors have fanlights, but not to the ceiling. All patients' rooms face south, and in the multi-bedded rooms there are four with side windows. There is an unobstructed corridor on the north side of the rooms. The kitchen is in the basement of the central block, the dining-room being on the ground floor on the south side, with a sitting-room adjacent. There are four slipper baths in one room on the ground floor, divided by curtains, and one douche room. There are eighteen water-closets, in groups of three, arranged on each floor in one room in the heart of the building with only one window. There is on each of the upper floors a room fitted with lavatory basins on both sides, in all there are thirty basins, the best accommodation I have seen in any sanatorium. The floors of all rooms are covered with linoleum. The walls and ceilings are of plaster, with concave angles, except at floors, the omission of which is, of course, complained of.

The patients' bedrooms are all on the first and second floors. The northern side of the ground floor of the west wing contains the matron's and nurses' rooms; that of the east wing the consulting room, lavatory, doctors' bathroom and the patients' baths. On the south of these are corridors, and south of these again are the *liegehallen*, about three metres wide. These form a structural arcaded verandah beneath the patients' bedrooms. There is also a *liegehalle* seventy-eight metres long in the woods, fitted with eighty couches. The ventilation of the patients' block is by the window and by a central turret. The medical officer's rooms are on the north side of the central block, with a committee-room on the first floor.

At some distance east of the sanatorium is an administrative block connected by a subway. This block consists of basement and three other stories. It contains the boiler and engine houses, disinfector, accumulator-room, laundry, stables for cows and horses, and residences for the remaining staff and female servants.

I conclude the description of German Sanatoria with that of the Nordrach colony in the Black Forest, nine miles from the little station of Biberach. To describe this colony one must picture the locality. The road from the railway ascends, and for some miles follows the river Hammerbach. The scenery is beautiful. On either side the hills covered with trees slope up from the river, sometimes gently, sometimes in bold escarpments. In the grey distance they rise to small mountainous heights dotted everywhere with trees, save for patches of greensward. In the midst the rapid river sparkling in the sun, which on the day of my visit also glistened on the snow-clad trees. Rising ultimately to a height of about 1,500 ft. above the sea, we passed through Nordrach, where a sanatorium of the hotel type has just been erected, and some half-mile or more beyond we come to Dr. Walthers' famous colony for consumptives. Here there is no sanatorium proper, but many small buildings dotted about the hill-side. We alight at one containing the office and kitchens, with a long dining-room for patients attached. A wooden structure, simple enough in character, with windows on both sides and a gravel terrace on one side. High up the hill to the left is the largest building of three stories, containing rooms for twenty patients. It consists of a long centre, with two short wings at obtuse angles of some 190 deg., so that they face to the S.S.E. and S.S.W. At the intersection of the angles are hexagonal turrets. There are two staircases. In this building, as in the others, each patient has a separate bedroom of about fifty cubic metres capacity. All have single casements with fanlights, which latter are hung at the top and open outwards. There are balconies to some of the rooms. The ventilation is by the windows and doors. Each bedroom is fitted with a douche bath, supplied with hot and cold water. There are only two slipper baths altogether, and these are solely used for medical purposes. There is only one water-closet for every ten patients, placed within the building. The floors are of wood, covered with linoleum. The walls and ceilings are of narrow boards, beaded not only at the edges, but on the solid parts, and there is a moulded wooden cornice. There are no concave angles. It is strange that all canons of smooth surfaces and rounded angles are here set at naught. The explanation probably is that there is no dust in the place. I have before noted that each bedroom is fitted with two lavatory basins, one for washing, one for sputum. There are no *liegehallen*. Dr. Walthers objects to them. He says, "You should not make patients lazy, but active." There are a few ordinary summer-houses in the grounds. Another building of two stories is provided for sixteen patients, and the rooms are only about 8 ft. high. It is not only electrically lighted, but heated by electric radiators of the doctor's own manufacture. The medical staff consists of Dr. Walthers and another physician of equal standing, as the doctor was careful to tell me. There is a secretary. There are no nurses as such, the doctor holding that nursing, as we know it, "ought to be done by the medical men." There are two female servants to every ten bedrooms. In parentheses it may be interesting to know that Dr. Walthers strongly objects to the plenum system of ventilation, about which we lately heard a good deal, of which he has had experience.

There are various other buildings forming the colony dotted about here and there. Among them is the doctor's house, with the sitting-room made so that in the summer the external wall or enclosure can be completely removed. It will be seen from the foregoing that Nordrach has nothing of the structural sanatorium about it. It is a hamlet on a mountain side, "far from the madding crowd." Nature provides varied refreshment for the body and mind. For the rest, it is a little world where patients place themselves under a medical man of strong, masterful personality, who orders their being generally. To live in such a position a life of simplicity under hygienic rules, to have no cares, and to be interested is to be, as nearly as our mortal frame will permit, free of disease. We have, however, to deal not with an ideal place and life, but with the workaday world. For ordinary mortals, and specially for those of our poorer brethren, we must bring to their aid everything that sanitary know-

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ledge of building can give. Before leaving this part of my subject I wish to express my indebtedness to the following medical gentlemen, who extended to me the most courteous hospitality and gave me in the readiest way every information and assistance in my investigations :—Dr. Hess of Falkenstein, Dr. Curschemann of Ruppertshain, Dr. Bauer of Nürnberg Engelthal, Dr. Hermann of Harlaching, Dr. O. Pischinger of Krailing, and Dr. Walthers of Nordrach.

It may now be of interest to briefly describe one or two modern English institutions. I have had the pleasure of visiting the sanatorium near Crookesbury Ridges under the direction of Dr. J. Rufenacht Walters. Dr. Walters is too well known as the author of an admirable book on sanatoria to need any other introduction here. His sanatorium is a small one, for twelve patients, but I am glad to learn it is about to be doubled. The sanatorium consists of twelve single bedrooms on one floor, all with French casement windows facing south and opening on to a verandah, canvas covered, for reclining couches. A corridor runs the whole length behind. There is one nurse, and she lives in the building. The cubic capacity of the rooms per patient is about 1,100 feet. The floors are of wood covered with linoleum. The walls and ceilings are of plaster, with slightly concave angles, except to floor—a regretted omission. The ventilation is by the windows, by inlet tubes, and by shafts at ceiling level across the corridor to the north. In the new block there will be fanlights to the doors, so that all the room may be scoured with air. There is a room with one slipper bath and one earth closet, both opening from the corridor. In the new block these will have disconnecting lobbies. The dining-room is attached, and also opens from the corridor, and beyond it are the kitchen and offices. The heat is by hot water radiators. The lighting is by electricity.

It might be here opportune to consider the question of the best position for *liegehallen* or reclining verandahs. There is some difference of English medical opinion on the subject. It is held by some, and it seems to be a sound doctrine, that if patients are so delicate that they must lie down the greater part of the day, they should be as near to the medical man and to their own bedrooms as possible, so as to save the strain of even a short walk. In three of the five typical German buildings described, the *liegehallen* form verandahs to the actual buildings, and the convenience of these is approved by the medical chiefs of all, the only complaints being in regard to excessive width and solidity of building. In one of the others there are reasons of planning why this cannot be done. At Crookesbury Ridges the same verandah scheme is adopted and approved, and is to be repeated in the new block. In the perspective view shown by me as a design for a sanatorium, I have adopted this arrangement with a balcony over for half the building, and it will be seen the width and construction is such that the German objections do not apply. Dr. Hermann thought this arrangement very satisfactory.

A larger institution is that called Pinewood, at Wokingham, designed by Mr. F. Jones, who has kindly lent me a plan. This has accommodation for sixty-four patients, each in a single bedroom of an average cubic capacity of 1,100 ft. The institution consists of a central block of three stories, containing the consulting-rooms, offices, and dispensary, with residences for the medical staff above. Detached from this on either hand is a patients' block of two stories, containing thirty-two single bedrooms. These blocks face S.S.E. and S.S.W., and each has a corridor on the inner or northern side. There is one staircase. The ground floor walls are of brick ; the first floor is enclosed by wood framing covered with boards and tiles. There is one resident nurse in each block. The douche and slipper bath-rooms and water-closets are on the north side of the corridor, and open directly from it. The windows are single casements which do not reach the ceiling. The doors have no fanlights. The floors are boarded and covered with linoleum. Walls and ceilings are of plaster. There are concave angles, except to floors, where angle fillets are fixed. The heating of rooms is by open fires, that of corridors by hot water radiators. Ventilation is by windows and doors. Lighting is by electricity. The administrative block is detached to the north, it contains a handsome dining-room, with service and nurses' rooms attached. Kitchen and offices, with female staff bedrooms over, and other rooms adjacent. There is a laundry block with disinfector, an engine-house, stables, &c.

I may now perhaps describe a sanatorium which the Brompton Consumption Hospital is about to erect at Frimley, in Surrey, from my designs. It is to accommodate one hundred patients, and, unlike the others, it is for non-paying inmates. There are fifty-two single bedrooms, twelve with two beds and eight with three beds. Every patients' room will face S., S.S.E., or S.S.W. Outside the central block is a wide paved terrace. It will be noted that, unlike the German Sanatoria, we have provided a large number of single bedrooms. By some it is held that for the poor, rooms with more than one bed are best, as patients like company. On the other hand, others—among them Dr. F. R. Walters—hold that it is better for the patient's recovery, be he rich or poor, to have a bedroom to himself. It must be remembered we contemplate that only first stage cases (with exceptions) will be admitted, and every inducement should be given to make patients get out into the open air as much as possible, the bedroom only being used at night. Of course, there are cases where it may be desirable for two or three to be together, as where bleeding is likely to occur, when one can help the other. We have therefore effected a compromise, fixing our maximum at three beds. Many of the German doctors with whom I have discussed the question favour this as the maximum when it can be adopted.

The sanatorium proper, or patients' block, is two stories in height, and consists of a central block with four radial wings or pavilions, all built of brick, the upper story tile hung on the brick. By this arrangement any one floor of the two sides of the four wings may be appropriated to women, leaving the others for men ; and each group is self-contained, with its separate sanitary conveniences. It also affords much greater facilities for classification than could be found in one building of the ordinary type. The main entrance hall is in the centre, and behind it is a day room facing south, with two three-bed wards at the sides. East and west of the hall are the consulting and matron's rooms, dispensary, and sister's duty-room. The first floor has similar patients' and sisters' accommodation, a residence for the matron, and a bedroom for the housekeeper. Overhead, in the roof, are bedrooms, &c., for female servants. The pavilions are connected to the centre by enclosed corridors having windows on both sides. Each wing contains twenty-two beds. The corridor on the north side has no obstruction whatever to light and air. Opposite every room door there will be a window in the corridor, and as all doors will have fanlights carried, like the windows, to the ceiling, we shall get thorough ventilation, and even on hot sultry days the cooler air on the north side of the building will induce a current to the hotter south side. The windows will be casements, those on the ground floor open to the floor, so that, if necessary, beds may be wheeled out. The casements are so constructed as to keep out rats and other vermin while the windows may remain wide open. On the first floor there will be outside jalousie shutters, which can be closed either to exclude rain or intense sun heat, the windows remaining open. On the ground floor, rolling canvas blinds, like those over shops, will effect not only the same purpose, but will shelter beds or couches outside. By this means we get the advantages of a verandah. On each floor are two large linen rooms, and on the ground floor are boot-cleaning rooms.

Between each pair of pavilions is a sanitary tower, detached except for a cross-ventilated lobby. This contains all the patients' water-closets, baths, lavatories, and housemaids' closets. I have provided no urinals in the building. They are filthy things at best, and with lifting closet seats are unnecessary. For the nursing staff on duty, separate lavatories and water-closets are provided on both floors. There are two main staircases, and at the outer end of each pavilion a fire-escape staircase. The heating generally will be by hot water, throughout the lighting by electricity. The floors will be of wood covered with linoleum, and all walls and ceilings will be of plaster with concave angles everywhere. To the north of the sanitorium proper, and reached by a glass-covered way for wet weather, are the two patients' dining-rooms and a general assembly hall. Behind are the kitchen block, female servants' hall and men's room, &c. At the east end is the nurses' home, to the west the medical officers' residence. Nearer the main road will be the laundry, boiler, and electrical engine houses, ambulance, mortuary, and gate lodge. There are two laboratories. The plans have received the most careful consideration of the medical staff, and I have particularly to express my indebtedness to Drs. Theodore Williams and Fowler, who, with the sub-committee, have gone minutely into every detail of the scheme.

In conclusion, may I be permitted to refer to the new Camberwell Infirmary in course of erection from my designs. There will be 800 beds in the institution. My reason for mentioning it here is, that the Board of Guardians have on the advice of the Medical Superintendents, Dr. Keats and myself, made special provision for treating tubercular patients. We have three large wards of twenty-four beds each, in which practically the whole length of the walls or enclosures on three sides are made to open, so that the patients may be said to lie in the open air, and above the wards are flat roofs with easy access, so that the patients can be actually in the open air all day long.

As far as I am aware, this is the first Poor Law institution in the kingdom where this has been done, and we hope it may be the means of bringing open-air treatment to the poor at their own doors in a practical way.

THE NEW PUBLIC OFFICES IN PARLIAMENT-STREET.

THE following letters on the above subject appeared in the *Times* of Saturday and Monday last :—

" To the Editor of the *Times*.

Sir,—I fear that there is grave danger that the public offices about to be erected in Parliament-street will be spoilt by the action which the Government propose to take.

It will be within the recollection of your readers that the architect, Mr. J. M. Brydon, who had been selected for the work, unfortunately died before his drawings were completed. It now appears that, from motives of false economy, the Government intend to entrust the completion of the designs to the Office of Works instead of following the precedent which was set on the death of Mr. G. E. Street before the completion of the Law Courts, when Sir Arthur Blomfield was appointed to superintend the completion of the building. It is true that the First Commissioner of Works proposes to add Mr. Brydon's chief assistant to his staff for this purpose, and I have not a word to say against this gentleman, nor against the permanent staff, who no doubt are thoroughly competent for their own special work ; but that work is not the erection of vast buildings of national importance.

The character of Mr. Brydon's design is such that its effect when completed will depend, far more than it is easy for the public to realise, upon the proportions of the cornices and mouldings, and the design of windows, doorways, and innumerable other minor parts of the building. Mr. Brydon was unable to complete the drawings for these details, and if, therefore, this important mass of buildings is to be carried out in a manner creditable to the country it is of the utmost importance that an architect of the first ability should be appointed to complete the designs of one who had been selected with much care from among the foremost members of his profession.—I am, Sir, yours faithfully,

ARTHUR W. SOAMES.

House of Commons, July 30.

SIR,—I think that some one who is not an architect should support Mr. Soames's appeal to the Government to appoint an architect of distinction to finish Mr. Brydon's incomplete drawings of the details of the new public offices. My excuse for joining in his appeal and for writing this letter is that I was a member of the Select Committee of the House of Commons that inquired into and reported in 1897 upon the sites for the proposed new Government offices. In the general proposals which they laid before that Committee the Government showed an unusual liberality and a large appreciation of the importance of adding to the dignity and beauty of Central London. And Mr. Akers-Douglas, as Chairman of that Committee, and since then in his conduct as Chief Commissioner of Works, has displayed deep interest in the successful execution of this great scheme, and a constant desire to consult the best architectural opinion.

It is the more remarkable, therefore, that the Government and he should now hesitate to take a step which common sense would seem to dictate. It is possible, no doubt, that satisfactory effect may be given to Mr. Brydon's designs by the officials of the Office of Works, assisted by Mr. Brydon's chief draughtsman. But who is there outside the walls of that office who is not convinced that it is in-

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finitely more likely that these details will be satisfactorily and artistically worked out if their execution be entrusted to some architect of note?—Yours faithfully, C. A. WHITMORE.

75, Cadogan-place, S.W., August 3.

SIR,—May I support the plea put forward by Mr. Soames that further steps should be taken by the Office of Works to complete the new public buildings in harmony with the intentions of the late Mr. Brydon? There is no financial difficulty, as ample provision was made by the Treasury for the architect's fees; 20,000*l.* was allotted for the Westminster buildings, and I understand that of this amount not much more than 10,000*l.* was spent during Mr. Brydon's lifetime. A very large balance, therefore, remains, and, while we all applaud the wisdom of Mr. Akers-Douglas in appointing Mr. Brydon's chief assistant to continue as draughtsman, I feel strongly that the money ought not to be intercepted by the Treasury.

The site is one of the finest in London, and it would be deplorable if we save a few thousand pounds and thereby imperil the dignity and refinement of our new Government buildings.—I have the honour to be your faithful servant,

74, Brook-street, August 3. BALCARRES."

MAGAZINES AND REVIEWS.

The *Magazine of Art* contains an article giving, under the title of "The Home of the Royal Cambrian Academy," an account and illustrations of the fine old house called Plas Mawr, at Conway, built in the sixteenth century by Robert Wynne, and now the premises of the Cambrian Academy of Arts. The writing and illustrations—the latter very good—are both by Mr. E. W. Haslehurst. Stephan Sinding, a Danish sculptor whose work is the subject of an article, appears to be one of the modern school of mystics in sculpture; his "Terra Mater" and "Man and Woman" suggest the influence of Rodin. An illustration is also given of a remarkable Kashmir shawl (modern work) worked with a plan of the city of Sringar. The execution is said to be so fine as to give at first sight the impression of stamped work.

The *Art Journal* describes Taormina under the title "A Suburb of the Sun," the illustrations being by Mr. C. Kingwood, and Mr. Arthur Tomson illustrates Dorchester with pen and pencil; and yet again there is another descriptive and illustrative article of the same kind, on Rothenburg, by Mr. James Douglas. There is a fine illustration of M. Debat-Ponsan's charming picture, "En Plein Air," as a frontispiece to the number.

In the *Studio* we come again on the Topographical article; Tréport being the subject. "Something too much of this." Mr. Alexander Fisher's article on "The Art of Enamelling" (continued from last issue) is really valuable, for it gives practical instruction in the technique of this fascinating branch of art.

In the *Artist* Mrs. Chance's paper on old and new furniture and on furnishing is very good in many of its remarks, especially as to the bad influence of fashion in turning out good designs and bringing in bad ones, but some of the illustrations, which we presume are supposed to be what we ought to like, are both poor and clumsy, and really not better than some of the despised trade furniture, only they are less hackneyed. Simplicity in furniture design need not descend into awkwardness and want of style.

The *Architectural Record* (New York) contains an article by Mr. Frank Fowler on "Mural painting and a word to architects." Mural painting appears to be receiving great attention in the United States, and Mr. Fowler's object in writing is partly to urge that the artist should be given his best chance by being entrusted with the colour-scheme and the decoration of a whole apartment. He instances (and justly) the serious mistake made in the Panthéon at Paris, by parcelling out the interior among a number of painters of totally different styles. As he says, if Puvis de Chavannes had only had the whole, we might have seen a great work in decorative painting, such as would have enhanced instead of destroying the architectural unity of the interior. To the same number Mr. Caryl Coleman contributes an article on the rather new subject of "Episcopal Thrones and Pulpits." An article on "New York Apartment Houses" by Mr. C. H. Israels, with a number of plans, may interest the builders of London apartment houses, though they may not think they have anything to learn from it, New York requirements in the way of plan and arrangement differing considerably from ours. The article on the "New York Stock Exchange," in its present edition a piece of academical classic architecture designed by Mr. Post, is of value on account of the plans and the detailed description of the construction and arrangement.

The *Architectural Review* (Boston) in No. 6 of its eighth volume, gives a number of interesting designs of memorial gateways erected at Harvard University; all, apparently, designed by Messrs. McKim, Mead, & White. A gateway is a very suitable form of memorial erection, and the examples given here, though they are all rather simple and unpretending in form for memorial gateways, are in the best possible taste, and show at the same time a great deal of variety. Besides those given in the plates, there are several other examples in the text, accompanying an article on the subject by Mr. W. D. Swan. The number includes another article, with some small illustrations, on "Recent Buildings at Harvard University," by various architects. They all seem to affect a very quiet and decidedly English style. This may be called a Harvard number of the *Review*.

The illustrations in the Berlin *Architekturwelt* show a curious collection of examples o the eccentric cleverness of modern German architectural and decorative design. There are views of a restaurant by Herr Reimann, which, except on the entrance or business-front, looks rather like a country château. There is a charitable institution in brick, with semi-Gothic details of a rather wiry character (Herr Diestel). Then we come on an effectively treated apartment house by MM. Schilling and Wiehe, a very nice piece of street architecture; followed by a large country house that looks like a church. Then we come to what are, let us hope, the examples of imaginary architecture only, for anything more rampant in its eccentricity than the "Landhaus" from the Berlin art exhibition of the year it would be difficult to find; it is a kind of nightmare. Messrs. Schulz & Schlicting's Casino (also an exhibition drawing) is something more reasonable; and Herr Reuters's competition design for the Dresden Rathhaus is a more sober and indeed somewhat heavy architectural conception; the same architect's sketch for a church is an almost lunatic design; on the other hand his sketch for a "Bismarck-Thurm" is rather fine, though the finish at the top is very ugly. Herr Reuters represents one type of German architectural design of to-day, in which the object seems to be to reduce everything to masses of wall and round stumpy columnar effects; it looks like an utterly unpractical school of architecture, suitable only for monumental towers and the like. The new school of furniture has its turn in the illustrations, and there are some examples of ceiling design of various degrees of eccentricity; that by Professor Seliger, with a figure with the feet pointing to each angle, and a symbolical representation of the sun and the starry heaven, is rather fine. Whatever may be said about the uncertainty of aim among English architects of to-day, we seem really to be very sober and collected in our aspirations in comparison with the Germans, if we may take the medley of this present periodical as typical.

The *Edinburgh Review* contains an article on the at present specially interesting subject of "Temporary Stars," for the appearance and disappearance of which no definite explanation is brought forward, though various suggestions are made; but the article is an able one by a competent hand. Another article which we may mention in the same number is that on "The Spectacular Element in Drama," in the main a defence of spectacular effect, which the writer thinks supplies the relief, for the less educated portion of the audience, which Shakespeare, in the absence of this resource, was fain to supply by the introduction of "comic business." It is rather curious to note that in following out this line of argument the writer of the article comes round (though without appearing conscious of the coincidence) to Voltaire's condemnation of the vulgarities of the porter in "Macbeth," as being quite out of keeping with the general spirit of the play.

In the *Quarterly* a paper on "The Dawn of Greece" reviews the recent discoveries in Early Grecian archæology, especially in Crete.

The *Monthly Review* contains a long article by "Julia Cartwright" (Mrs. Ady) on the Castello of Milan, which has been in process of repair and restoration (we hope not of too drastic a character) during the last eight years, under the direction of two architects, Signor Beltrami and Signor Gaetano Moretti. A plan of the castle is given (it is something rather new in England to find a literary review condescending to give plans of buildings), and a sketch of its history, together with photographs of paintings in which some of the former owners of the castle are introduced, or which are connected with its history.

In *Blackwood* the writer of the generally witty and thoughtful "Musings without Method" has a good deal to say, with which we are entirely in agreement, in regard to the neglect of old buildings of interest, and the indifference with which people in this country will allow an interesting old building to be pulled down, or a fine view to be spoiled by buildings of no charm. He speaks well and eloquently in regard to the subject of Hogarth's house, and of the view from Richmond Hill. But he falls into the common and vulgar error of attributing these vandalisms to architects, who are in fact the strongest opponents of them. He must needs indulge in the usual easy sneer at the English architecture of the day. "The architecture of modern England is oddly suited. It buys its windows in Italy, its round towers in France, its tiles in Lambeth, and its decorations everywhere." This is of course a parody of a well-known speech in Shakespeare—Portia's description of one of her suitors; but there is no point in it. Where are the round towers that are "bought" from France, or the windows from Italy? The prevalent tendency of English architecture lately has been to become decidedly English—to take the detail of our own classical buildings as a model. The sentence is therefore nonsense, and suggests that the writer has paid no attention to recent architecture. What follows is still more absurd, and in fact worse than absurd: "moreover, our architects have too often shown so keen a desire for a job that they have condemned as unsafe walls which, having stood the storms of centuries, were prepared to endure the centuries yet unborn." That is an utterly unpardonable libel on architects, who, as a fact, are almost always on the side of conservatism in dealing with old buildings; and in cases where an architect does condemn walls as unsafe, is it not possible that he is a much better practical judge of the matter than a literary man? It is not creditable to a magazine of the standing of *Blackwood* to publish such nonsense; but on these subjects, unfortunately, the editors of literary magazines are as ill-informed as their contributors.

In *Scribner* Mr. Frank Fowler, under the heading of "The Field of Art," asks what is the best heritage of the art of painting from the nineteenth century. In an American magazine we know the answer before we read. It is the latest school of France which is the heritage; beginning with Troyon and Rousseau and ending with Millet and Monet. We are shown that the revolt of Delacroix and Géricault against the Academic School was only half a revolt; that they still retained a convention of their own, and did not come into close enough contact with nature. That is true; Delacroix was thought a dangerous radical in his own day; we now see that he was nothing of the kind. We can also see—what Mr. Fowler apparently does not see—that Troyon and Rousseau were no more "natural" artists than Delacroix. They translated nature into an art of their own, they did not imitate her. It is now asserted that the latest school of all—Monet and the other impressionists, are the people who have led us into the true path in painting. So it seems to many people now; but how will it seem fifty years hence? Will there not be critics then who will find out that the Impressionists had not got hold of the real thing, just as Mr. Fowler can now see that in the case of Delacroix? In the same number is an interesting topographical article on "Rural New York"—the picturesque and rural element on the outskirts of New York, with illustrations showing what very primitive and very English-looking cottages and farms are to be found around the outskirts of New York.

In the *Century* Mr. Cole's "English Masters" series of engravings is represented this month by a very good translation of Turner's well-known work "A Frosty Morning," one of the finest of the works of his middle period. The frontispiece forms No. 6 of "Examples of American Portraiture," a portrait of a lady by

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Mrs. Adelaide Cole Chase, an artist who is a native of Boston, and has studied under MM. Jean Paul Laurens and Carolus Duran. The portrait is one with a good deal of original character. "Venice Gardens" is what may be called an ornamental article on this charming subject, by Mr. Lee Bacon, and is decorated with a profusion of ornamental borders and sketches by Mr. H. McCarter. An article on "Photographing by the Light of Venus," by Mr. W. R. Brooks, gives some surprising examples of photographs obtained, on a highly sensitive plate, from the light of Venus, without the interposition of any lens or magnifier. "What a Train-despatcher Does" may be of interest in giving us an insight into American railway working; we have nothing to learn from them in that way. It is amusing to read some of the specimens of telegrams—"Engine 309 leaking, and could not handle full train from Piedmont," &c. That is what comes of the American system of building locomotives cheaply to last only ten years, till the next new model comes up.

In *Harper* "The Birth and Death of the Moon," by Dr. E. S. Holden, is an admirable popular *resumé* of what astronomical science can tell us in regard to the past and probable future history of the moon and its mechanical relation to the earth.

The *Pall Mall Magazine*, under the title "Napoleon at Play," gives the history and some illustrations of his Consular house at Malmaison, now (through the munificence of M. Osiris) preserved as a Napoleonic museum. "Over a hundred miles an hour—the story of the Monorail," by Mr. Wayland Smith, jun., is a paper on the subject of the projected monorail line from Liverpool to Manchester, with illustrations of the railroad and carriages. The writer sees everything *couleur de rose* in regard to his favourite system of railway, and we can by no means accept all his conclusions, which still want the practical test of experience, but the subject is likely to be of increasing interest. In support of the argument that high speeds are safer and more practicable on a monorail than on the ordinary double track, Mr. Smith cites, what certainly seems to be to the purpose, the superior flexibility and safety of the bicycle in turning corners at speed, as compared with the tricycle. But then the bicycle rider brings his bodily balance into play, leaning over to the inner side of the curve as he turns, to neutralise the centrifugal force. Is any similar action contemplated or possible with the monorail electric railway?

The *Westminster Review* contains an article by Mr. E. H. Selby Lowndes on "The Rural Exodus," an endeavour to arrive at the causes of the continual migration from rural districts to London and other large towns. Mr. Lowndes has a new theory to account for this, which may be correct. He thinks the causes are to be found in the dulness of country life and in the awakened ambition of the present better educated race of labourers, rather than in any housing or labour problem. An agricultural labourer who has had a temporary town berth and returns to his native fields, does so in a spirit of superiority of which he makes no secret. He has seen life, and his rural compeers are ambitious to see it also. There may be a good deal of truth in this. If so, what is the remedy? Perhaps the solution is suggested in the epilogue to Tennyson's "Princess." Let the influential and wealthy country gentlemen exert themselves to put more life and interest into their neighbourhoods.

In the quarterly *Journal of the Sanitary Institute*, the only important sessional paper is that by Drs. Kenwood and Butler on "Sewage Purification and Standards of Purity." The authors believe that the biological method of sewage purification is not only the most rational, but also the most effective, and that what may be termed percolating filters are much more effective than filters which are allowed to stand full for a time. They are also in favour of preliminary tank-treatment, although rather for the purpose of simple sedimentation than for any gain in purification effected by anaërobic bacteria. In the discussion Dr. Rideal insisted on the necessity of anaërobic treatment for the purpose of hydrolising fat, celluloid, straw, vegetable fibres, &c. The authors' contention that the ordinary standards of chemical analysis are quite untrustworthy as an index of the character of an effluent appeared to meet with general approval, as did also their definition of a good effluent as one that will "not undergo offensive decomposition under any circumstances to which it is likely to be subjected before finally reaching the sea." In a contributed article, Mr. Douglas Archibald draws attention to some of the defects of the biological treatment of sewage, particularly the small degree of purification effected, and suggests that chemical precipitation in tanks followed by filtration, will give much better results at little or no extra cost.

Feilden's Magazine contains an important article by Mr. Milton P. Higgins, on the possibility of getting a higher standard of general education among machinists, by a system of half-time school and half-time working extending over four years. The moral is of course that we can get the best work from the best educated machinists, those who combine intellectual education with familiarity with practical work. Among the other contents of the number are an article on "Modern Ice-making and Refrigerating Plants," and one, the first of a series, on "How Great Britain is Meeting Foreign Competition," this article dealing with the subject of electric traction. In the course of the article it is mentioned that some American managers computed that they could get as much work from English workmen in a fifty-hours' week as from American workmen in a sixty-hours' week. This is not what we generally hear, and is so far satisfactory. The writer considers that it is from the want of capital and enterprise rather than from any deficiency in the manual labour that England is losing her foreign trade.

In the *Engineering Magazine* is an article on "The American Locomotive as a High-speed Machine," in which the writer makes the damaging admission (which we are not in the least surprised at) that the nature of a large proportion of the railroads in America renders high speeds impossible, even with the best constructed engines. "There is no object in building higher-powered locomotives to drag trains up steep hills, and round short curves, or upon gradients more or less heavy, by brute force. There it is merely burning the candle at both ends, for it increases the expense of maintenance without improving the service." The criticism, it will be observed, is purely from the commercial point of view; the question of the safety of the passengers does not come in. A long article on "Great Electric Installations of Italy," by Signor Bignami, will probably be of interest to English electrical engineers.

In the *Essex Review* (quarterly) an article on "The Dykes of the Thames" gives a *résumé* of a subject of both practical and picturesque interest, about which even Londoners, who live so near the lower Thames, for the most part know very little. It is interesting to find that some of the first dykes made to keep the Thames water within bounds were constructed by Dutchmen, brought over here in consequence of their national familiarity with the problem.

The *Church Builder* (quarterly) contains No. 8 of Mr. Micklethwaite's series of "Occasional Notes on Church Furniture," in which he is sarcastic (and not without reason) on the mischief done by "the practical man" who undertakes to carry out small repairs in the church from time to time without troubling the authorities to call in the architect.

We have received also the *Revue Générale*, the *Gentleman's Magazine*, and *Knowledge*.

COMPETITIONS.

Mallock Memorial, Torquay.—The result of this competition has now been published. The successful competitor is Mr. Donkin, F.R.I.B.A., of Bournemouth. The number of designs submitted was 79. Mr. Hine, architect, of Plymouth, assessed the designs on behalf of the Committee, and his recommendation of Mr. Donkin's design was accepted by the Committee.

New Bridge, Whitchurch. — The wooden bridge that crosses the Thames between Whitchurch and Pangbourne is to be replaced with one constructed of steel, and with abutments of brick and screw piles; the new bridge, having a total length of 270 ft. in four arches, has been designed by, we understand, Messrs. Joseph Morris & Son, of Reading.

Theatre, Lowestoft.—Lowestoft Theatre in the Marina has been rebuilt and renovated. The plans were prepared by Messrs. Ernest Runtz & Co., of London. The building contract has been carried out by Mr. George Elsey, of Kirkley. The building has cost between 6,000*l.* and 7,000*l.*, and will seat 1,300 persons.

Illustrations.

COMPETITION DESIGN, HEREFORD MUNICIPAL OFFICES.

THIS design was submitted in the recent unsatisfactory competition reviewed in the *Builder* of July 20, the illustrations showing an attempt to provide the accommodation required in a convenient, workable, and architectural manner.

The street façade was to be executed in Portland stone, and the roof covered with stone slates.

The authors, Messrs. Bateman & Bateman and Mr. Alfred Hale, of Birmingham, submitted the drawings under the device of a figure 1 within a green wreath.

We give the perspective view, section, and two plans.

NEW COLLEGE, SCARBOROUGH.

We give the perspective view and two plans of this building, the architects of which are Messrs. Hall, Cooper, & Davis, of London and Scarborough, whose design was selected in a competition.

The building is to be constructed of local material faced with local red pressed bricks and stone dressings, the roofs being covered with red Ruabon tiles. The main entrance has a southern aspect, and the main road to the college is planned from Filey-road. Care has been taken to arrange the block so as to sever the master's house from the school and dormitories, and yet make the whole one building, the connecting link between the two being the kitchen. The arrangement of rooms on the south of the building comprises the main entrance, with inquiry office and entrance hall. To the east of this is the master's common-room and boarders' recreation and reading room, which is 29 ft. by 17 ft., and is fitted up with bookshelves and specially arranged so that the pupils may have its advantages for night study in lieu of the schoolroom. To the west of the entrance is the secretary's office and boardroom (the latter being adaptable to other requirements), and master's study, which is carefully arranged in order that the master may have access to the school apart from his residence. The dining-hall is to the north of the principal staircase on the first floor, and is capable of dining 100 scholars, the tables being arranged so that all the boys face the centre table. The plans show the room to have two spacious bay windows overlooking the sea. To the west of the dining hall is the servants' room, and adjoining is the kitchen and scullery. The servants' hall, china closet, &c., adjoin the kitchen. The master's house is at the south-west angle of the building, having a separate entrance, with convenient dining-room and drawing-room overlooking the south front, and adjoining the study.

The schoolroom is entered from the main entrance corridor, which corridor runs the whole block of school buildings, and could be extended with any future extension of classrooms. The schoolroom is 52 ft. by 24 ft., and is capable of assembling 200 boys. It is to be heated with hot-water radiators, and the plans show two large open fireplaces at each end in addition. To the west and south are arranged three classrooms, properly lighted, fitted with dual desks, heated with radiators and open fires, and arranged to accommodate ninety-six boys, in addition to which classes could be taught in the schoolroom and lecture-hall. To the north and east of the schoolroom is arranged the day scholars' entrance with vestibule porch. The chemical laboratory is planned to accommodate twelve boys at practical work at the same time, and is to be fitted with the latest chemical arrangements, working tables, &c., in accordance with the regulations of the Science and Art Department. The lecture-hall is to be fitted with desks, seats, and a demonstration table. To the west of the school arrangements are made for lavatories, clothes drying-room, and boarders' locker-room, fitted with a separate locker for each boarder, and provided with a lobby entrance from the grounds, by which the boys can reach their lockers and drying-room after football and other sports without using the main entrance. The first floor is reached right and left of the main staircase, and a spacious landing is planned with head assistant master's room overlooking it, to the right of which are the dormitories. Two dormitories

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have seventeen beds each, and one dormitory nine. Each dormitory is overlooked by an assistant master from his bedroom. In the master's house there are five bedrooms, bathroom, &c., and the servants' bedrooms are immediately over the master's house, and completely cut off from the other part of the building. On the third floor is the nurses' bedroom, sick day-ward, and a sick night-ward, specially isolating any sickness from the other rooms. Here also is an extensive boxroom, fitted with box racks, and connected with a lift direct from the main hall. Five servants' bedrooms are shown, but the architects state that these can be extended when required. The whole building is to be warmed by open fires and steam radiators under low pressure. The ventilation will be by means of automatic or natural ventilation.

The contractors for the work are:—For bricklayers', masons', and plasterers' work, Messrs. Overton & Son; for carpenters' and joiners' work, Mr. Geo. Scales; for plumbers' and glaziers' work, Mr. G. F. Wells; ironfounder and smith, Messrs. Appleby & Brogden; tilers' work, Mr. Joseph Hargraves; painting, Mr. Thos. Fidler. Mr. R. Dove was clerk of works.

Mr. H. C. Fehr has modelled a symbolical sundial with figures over the main entrance on the south front.

The school furniture and chemical laboratory and lecture theatre fittings are by Messrs. C. White & Co., London.

PROPOSED COUNTRY HOUSE, NORTH DEVON.

THIS is a design for a small house made by Messrs. Baillie Scott & Seton Morris, who however we believe are no longer in partnership.

The plan shows more attention to the differing requirements of aspect in dining-room and drawing-room than we sometimes find in small house plans. The drawing-room has its chief window west; the dining-room (which in so small a house would also be the breakfast-room) has its chief window east, but a small bay, out of the main line of lighting, gives the opportunity for a south outlook when desired. The kitchen is, we presume, top-lighted.

ADDITIONS, ROWLEDGE, NEAR FARNHAM.

THIS illustration is from a coloured drawing by Mr. John Fulleylove, R.I. It represents additions made to a small cottage having a large garden. The materials were local red brick and Portland stone. The work was carried out by Messrs. Thompsett & Kingham, of Farnham, from the designs of Mr. Thomas Batterbury, architect, of London.

ARCHITECTURAL SOCIETIES.

ULSTER SOCIETY OF ARCHITECTS.—A special general meeting of the members of this Society was held in the rooms of the Society, 16, High-street, Belfast, on the 22nd ult. The chair was taken by Sir Thomas Drew, R.H.A. (President). The minutes of last meeting having been read by the honorary Secretary (Mr. N. Fitzsimons) were confirmed. Messrs. Craig, Jackson, and Tulloch were appointed to open ballot-papers for new members, and having handed in their report, the chairman declared the following to be duly elected, viz.:—As Member—Mr. W. J. W. Roome. As Associates—Messrs. R. Donnelly and J. V. Johnston. As students — Messrs. W. A. Douglas, E. R. Kennedy, and J. M. M'Glade.—Sir Thomas Drew, in an address, congratulated the members on the rapid progress made by the Society since its formation, and expressed the hope that in a short time all the respectable architects of Ulster would be members and would be working together as harmoniously as the architects of Dublin and other large cities in the kingdom. — The Vice-President (Mr. W. J. Gilliland) made a statement on behalf of the Council as to the business transacted since the general meeting, held on May 28, and as to the prospects of the Society generally. He mentioned that seven meetings of the Council had been held, and, in addition, meetings of sub-committees for special purposes. Two representatives had been appointed to represent the Society on the council of the Royal Institute of the Architects of Ireland, and the Royal Institute of British Architects had been officially informed of the inauguration of the Society, and had entered into official communication with it. The first appointment of architects, since the formation of the Society, for work of a public nature in the district—that of Messrs. Græme-Watt & Tulloch, for the new asylum buildings at Purdysburn for the Belfast Corporation—was considered, and the details of the terms, which were placed before the Society at the request of the Council, were discussed, and were reported as unsatisfactory. A resolution had been forwarded to the Town Clerk on June 12 complaining of this unsatisfactoriness. The points objected to were that no travelling expenses were intended to be paid, that the remuneration was under that recognised in the profession, and that there were various other conditions as regards approval of plans and arbitrary rejection of same on account of disapproval by the Asylum Committee, or, in case they exceed the architect's approximate estimate by more than 10 per cent., without his having the opportunity to recast them to bring the proposed buildings within the permitted cost limit. The opinion was expressed that when the Asylum Committee understood that the proposed conditions were unfair and unreasonable, the majority, at least, who only wished to be equally fair to the ratepayers and to those whom they employed, would at once make the modifications which were suggested, as, of course, it was entirely against the interests of the ratepaying community that any services, especially those requiring great care and skill—the absence of which in architectural work was so disastrous in result—should be inadequately remunerated. —A communication had been received from the Belfast Master Builders' Association in reference to the framing of a common form of conditions of contract, and as to other matters which they thought it would be to the mutual benefit of architects and contractors to discuss, and, if possible, settle. It was reported that sub-committees had been appointed by the Council of the Society and the Master Builders' Association to have a conference with this object, and also that communications should be opened with the Royal Institute of Architects of Ireland, so that these matters should be settled to apply all over the country, instead of merely locally. The technical instruction of architectural students had also been considered, and application had been made to the Technical Instruction Committee of the Corporation for representation on the No. 1 Consultative Committee of the Technical Institute, and the Corporation had agreed to co-opt two members out of four names to be submitted by the Society. It was felt that those members elected on the Consultative Committee would be of service in advising as to the art instruction of architectural students, and that the experience gained on the committee would enable the Society to decide at a later date the question of the advisability of the promotion of classes in the new Technical Institute specially for architectural students. A recent competition, which was unsatisfactory in its results, was referred to, and the hope was expressed that now when a professional Society was in existence to watch over the interests of its members, such would not occur again. The attention of the members was called to two resolutions of the Royal Institute of British Architects, passed on March 5, 1900, which read as follows:—1. "That it is not derogatory to the profession for an architect to sign his buildings in an unostentatious manner, similar to that adopted by painters and sculptors." 2. "That it is undesirable for architects to place their names on boards or hoardings in front of buildings during course of construction for purposes of self-advertisement." It was reported that the prospects of the success of the Society were of the most encouraging character, and it was expected that within a very short time the membership would include every respectable architect resident within the district. The members were urged to support the exertions of the Council by utilising their services in every possible way, especially by calling their attention to any matter of professional interest which came under the notice of any member. It was hoped by the individual endeavour of each member to support the objects of the Society as set out in its constitution, that the larger proportion, if not all, of the disadvantages and grievances under which in the past the profession in the district had laboured would be ultimately removed.—On the motion of Mr. M'Donnell, the action of the Council in renting and furnishing rooms was confirmed.—Mr. M'Donnell moved "That the following four names be submitted to the Technical Instruction Committee, viz.:—Messrs. W. J. Gilliland, W. J. Fennell, H. Seaver, and N. Fitzsimons."—Mr. Tulloch seconded the motion, which was unanimously agreed to.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The Leeds and Yorkshire Architectural Society recently made an excursion to Giggleswick, to inspect the new chapel now being erected at the Grammar School. The donor is Mr. Walter Morrison, and the architect Mr. T. G. Jackson, R.A. The visitors were entertained by the head master (Rev. G. Style), and were conducted over the chapel by Mr R. Evans (clerk of the works).

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the Building Act Committee of the London County Council, held on July 29, being the day before the Council adjourned for the summer recess, the proceedings were governed by the clause in the Order of Reference, which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the Order of Reference. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Proposed New Street out of High-street, Portland Town.

That an order be issued to Mr. F. J. Stevenson, refusing to sanction the formation or laying out of a street for carriage traffic to lead out of the north-east side of High-street, Portland Town, St. Marylebone (for Lord Howard de Walden).—Agreed.

Lines of Frontage and Projections.

Strand.—Retention of a projecting illuminated sign at the third-floor level in front of No. 45, Strand, extending beyond the general line of buildings in that street (Messrs. Wylson & Long for Messrs. Anstiss).—Consent.

Hampstead.—An iron and glass hood over the entrance to a house known as "Kidderpore," Finchley-road, Hampstead (Messrs. W. E. & F. Brown for Mr. G. A. Dunn).—Consent.

Lewisham.—Ten houses, with shops on the ground floor, on the west side of Perry Hill, Catford, southward of the Two Brewers public-house (Mr. F. H. James).—Consent.

St. George, Hanover-square.—A wooden oriel window at the ground floor level, in front of No. 11, Stratton-street, St. George, Hanover-square (Mr. W. Woodward for Lord Welby).—Consent.

Clapham.—Three houses, with shops on the ground floor, on the north side of Battersea-rise at the corner of Limburg-road (Mr. G. E. Nield for Mr. W. J. Vokes).—Consent.

Clapham.—A one-story addition at the rear of the Prince Alfred public-house, Haines-street, Battersea, to abut upon Tweed-street (Mr. M. P. Saunders for Messrs. Watney, Combe, Reid, & Co., Limited).—Consent.

Deptford.—Fixing of two lamps at the White Hart public-house, Grove-street, Deptford, to overhang the public way in New-street and Grove-street (Messrs. Humphreys-Davies & Co. for Messrs. Style & Winch, Limited).—Consent.

Fulham.—Extension of the period within which the erection of one-story shops upon part of the forecourts of Nos. 19 to 26 (inclusive), Effie-road, Walham Green, was required to be completed, be granted (Mr. T. J. Evans for Mr. T. Davies)—Consent.

Kennington.—A one-story addition to the drill hall, No. 76, Lower Kennington-lane, Kennington, to abut upon Reedworth-street (Mr. G. A. Lansdown for the Commanding Officer of the 3rd Middlesex Volunteer Artillery).—Consent.

Mile End.—A railway station building on the north side of Mile End-road, Stepney, at the corner of Globe-road (Mr. C. A. Brereton for the Whitechapel and Bow Railway Company).—Consent.

Mile-End.—A railway station building on the south side of Mile End-road, Stepney, at the corner of Brantridge-street (Mr. C. A. Brereton for the Whitechapel and Bow Railway Company.)—Consent.

St. Pancras, West.—An iron and glass shelter over the entrance to No. 13, Cumberland-terrace, Regent's-park (Messrs. W. H. Lascelles & Co. for Miss A. Curtis).—Consent.

Woolwich.—Retention of two one-story shops (numbered 98B and 98C respectively) on the south side of High-street, Plumstead, abutting upon Mineral-street (Mr. A. L. Guy for Mr. W. H. O. Ainslie).—Consent.

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Newington, West.—An extension of the period within which the erection of five projecting arc-lamps on the parapet wall in front of the Princess of Wales Theatre, Kennington Park-road, Kennington, was required to be commenced, be granted (Messrs. H. Greene & Sons, Limited).—Consent.

Strand.—A factory building on the east side of Martlett's-court, Drury-lane, at the corner of Crown-court (Mr. H. O. Ellis for Mr. L. Upcott Gill).—Refused.

Hackney, South.—A two-story cottage on the east side of Durrington-road, Clapton-park, Hackney, to abut upon Ashenden-road (Mr. H. M. Wakley for Mr. R. H. Barnes).—Refused.

Lewisham.—A house, with a shop on the ground floor, on part of the forecourt of No. 4, Belmont-hill, Lee (Mr. W. C. Banks for Mr. C. E. Banks).—Refused.

Wandsworth.—A block of residential flats on a site at the south-east angle of Franche-court-road, Earlsfield (Mr. G. F. Grover for Mr. T. Hailstone).—Refused.

Width of Way.

Woolwich.—Buildings at the rear of No. 1, Beresford-square, Woolwich, at less than the prescribed distance from the centre of Beresford-street (Mr. A. E. Parnell for Mr. M. Barnett).—Consent.

Southwark, West.—A warehouse building on the east side of Pontypool-place, Valentine-place, Southwark (Messrs. J. Hoare & Son for Messrs. J. Pascall, Limited)—Consent.

Whitechapel.—Two blocks of dwelling-houses on the south side of Finch-street, Spitalfields, at less than the prescribed distance from the centre of Hope-street, and to exceed in height the width of that street (Mr. J. L. Williams for Mr. H. J. Brown).—Consent.

Islington, West.—A two-story building, to be inhabited by persons of the working-class, at the rear of Nos. 42 and 44, George's-road, Holloway, at less than the prescribed distance from the centre of George-street-mews (Mr. S. Allen).—Refused.

Width of Way, Lines of Frontage, and Projections.

Strand.—Retention of an iron and glass sign at the Savoy Palace public-house, Savoy-street, Strand, extending beyond the general line of buildings in that street (Mr. J. E. Chevers).—Consent.

Chelsea.—An addition on an existing porch and entrance lobby at the side of No. 123, Church-street, Chelsea, at less than the prescribed distance from the centre of Elm Park-road (Mr. F. G. Knight for Mr. F. Moscheles).—Refused.

Width of Way and Space at Rear.

Whitechapel.—A cottage and stables on the south side of Winthorpe-street, Whitechapel, next the East London Railway, with the forecourt fence at less than the prescribed distance from the centre of the street, and with an irregular open space at rear (Mr. J. Woodard for Messrs. Harrison, Barber, & Co., Limited).—Consent.

Line of Frontage and Construction of Building.

Dulwich.—A wood and iron office to adjoin Dulwich railway station, Thurlow Park-road, Dulwich (Messrs. Marten & Carnaby).—Refused.

Formation of Streets.

Woolwich.—That an order be issued to Mr. H. O. Thomas sanctioning the formation or laying out of a new street for carriage traffic to form a continuation of Roydene-road, Plumstead (for Messrs. G. E. Arnold & Co.) That the name Roydene-road (in continuation) be approved for the new street.—Agreed.

Lewisham.—That an order be issued to Mr. J. W. Webb, refusing to sanction the formation or laying out of new streets for carriage traffic on part of the Crofton Park Estate, Crofton Park-road, Lewisham.—Agreed.

Buildings for the Supply of Electricity.

City.—An addition to the distributing station Nos. 82 to 84, Fenchurch-street, City, (Messrs. Clifton, Son, & Hope for the Charing Cross and City Electric Company, Limited).—Consent.

Westminster.—A temporary iron chimney shaft at the company's generating station, Millbank-street, Westminster (Mr. C. Stanley Peach for the Westminster Electric Supply Corporation, Limited).—Consent.

Height of Buildings.

Hoxton.—A warehouse building on the south-east side of Vestry-street, Hoxton, to exceed in height the width of that street (Mr. A. Keen for Mr. J. Kent).—Consent.

Strand.—A building on the east side of Martlett's-court, Drury-lane, at the corner of Crown-court, to exceed in height the width of Martlett's-court (Mr. H. O. Ellis for Mr. L. Upcott Gill).—Refused.

Cubical Extent and Construction.

Lambeth, North.—A one-story addition to a building on the south-west side of Walnut Tree-walk, Lambeth, which building and addition together will exceed in extent 250,000, but not 450,000, cubic feet, and which addition will be used only for the purposes of a standing place for motor cars and omnibuses and a blacksmith's shop (Mr. C. Barker for the Motor Traction Company, Limited).—Consent.

Separation of Building.

Bermondsey.—The formation, on the ground floor of an opening in the party wall between Nos. 219 and 221, Borough High-street, without making the buildings in conformity with Sections 74 (2) and 77 of the said Act (Mr. T. W. Willis for Mr. F. H. Barker).—Consent.

Dwelling-houses on Low-lying Land.

Greenwich.—That the solicitor do prepare a licence under Section 122 of the Act to Mr. E. Petters, for the erection of three dwelling-houses on low-lying land at Blackwall-lane, East Greenwich.—Agreed.

The recommendations marked † are contrary to the views of the Local Authorities.

Correspondence.

To the Editor of THE BUILDER.

BUILDING LAW.

SIR,—I think it time that architects, builders, and owners concerned should have opportunity of protest and correction against the growth of positive law, in contra-distinction to negative law in respect to building.

The perfect maze which building law has now assumed is a standing menace to the future production of property, and is acting as a weapon not only to destroy all individualism, but is forcing design and invention into such narrow ways as to entirely destroy all good work, artistic taste, and novelty. We were once controlled by Statutory Law constructed with full consideration and consultation of practical men, and which was no "hole and corner" institution. Now, by some means of doubtful power by the public bodies, a whole host of exact and positive clauses are made, all of various fads and ideas as may suit the guiding direction as it may come from one district or another.

The whole question is an irritating evil, because much of it is not based upon experience. Many of us who have spent our lives in the trade have learned and proved certain axioms of work which, after years of test, we are compelled to cast to the winds, simply to satisfy exact and positive law in any particular district. If I am compelled against my own experience and judgment to do bad work, what is more irritating?—especially when you retain an interest in the property affected. As an instance, every practical man knows of the absurdity of the 1894 Act of the London County Council in regard to the composition of plastering; the result has been of the worst possible character, for there are very few sound ceilings done under that *positive* direction; they are resonant, brittle, "alive" for years, and caustic to such a degree as to be for some work absolutely useless. Hard, and unyielding, the least shrinkage does them damage. If I can produce a better ceiling in my way, it is monstrous that the London County Council should exact that it is to be positively done in their way.

It is true that to prevent bad work legislation may be necessary; but let it be fairly constructed and of a negative character, so that genius and experience may get fair and full exercise.

Then, again, some district by-laws are claused with positive directions as to timber sizes—a monstrous stupidity—often not stock sizes. Houses of a certain class should be required to carry over so many square feet of floor space a certain load without extreme flexure, leaving the size and skill of the construction to the operator. At present your house may conform to the law and yet be a bad building.

Then, again, I notice some by-laws now in print, which have not passed the scrutiny and the signature of the Home Secretary with the statutory six weeks' delay for objections, but are now signed as allowable by the Local Government Board under the authority of their general order of May 26, 1877, whatever this may mean.

Now, sir, here is perhaps drastic positive law, possibly stupid to a degree, emanating from the brain of some insignificant jack-in-office in an Urban Council, signed by a Mayor and a Town Clerk, and with the above dubious official concurrence a copy is handed over as a guide and counsellor to a man who perhaps built good houses before the author was born, and is asked to construct his own houses against his experience and conviction of rectitude in a way as though public bodies were the owners and not himself.

What I contend is that as the statutory law exists, no by-law should be signed unless oral examination has taken place of architecs and builders concerned in equal proportion; so many according to the population or area affected.

Very much more could be written upon this very important matter did space and time permit.

EXPERIENTIA.

PENALTIES IN BUILDING CONTRACTS.

SIR,—In a contract under the usual terms and under agreement providing penalty for delay on non-completion, and where it is proposed to enforce this: (1) In issuing certificates should this amount be considered as a deduction from the amount of contract, and pending the final certificate be so deducted by not issuing certificates for the full amount of contract? (2) Is an architect liable to his client if he issued certificates and took no account of the penalty if he thought the contractor had used fair diligence, and could the amount be recovered from the architect? ENQUIRER.

*** The deduction for penalties should be made on the final certificate, which should reserve a sufficient amount to leave a margin for penalty deductions, if enforced. It is very seldom that the contractor is without some kind of more or less logical defence in regard to delays, which ought at all events to be heard and considered. To attempt to deduct in proportion on each certificate would be raising the question two or three times over instead of settling it once for all at the final settlement of the accounts; and the architect would certainly not be "responsible to his client" for leaving the penalty deductions over to the final settlement. If the client attempted to make him so, he would take a very foolish and, in our opinion, untenable position.—ED.

THE PROPOSED WIDENING OF PICCADILLY.

SIR,—In your last issue a road is suggested leading from Piccadilly to the Mall along the back of the houses in Arlington-street. This formed part of my scheme for laying out the ground around the Queen Victoria Memorial, which you did me the honour of publishing in your issue of April 27 under the undersigned motto.

I was about to suggest that Pall Mall be continued on through Cleveland-square to the Park, but have been anticipated by a writer in the *Times*. This, in addition to being an improvement from the traffic point of view, would add very much to the effect of Pall Mall, bringing the entrance front of Bridgewater House in line with it, and provide an open space in front of St. James's Palace.

"PLAN THE BASIS OF DESIGN."

PORTLAND CEMENT TESTING.

SIR,—Referring to the letter signed "The Writer of the Article" in your last issue, it does not follow that an office boy or labourer can do all that is necessary in testing Portland cement because the writer's tests were carried out by labourers, as it is obvious from his own letter they must have been skilled men, and doubtless worked under his direction.

I quite agree that two men will make up briquettes of the same cement and get very different results, and I shall prove this by getting an ordinary labourer to make one lot and a skilled labourer who has been taught to make another lot. I did not suggest a chemist was required for the testing.

Also, in reference to the writer's observation that "it appears not so much to depend upon whether he is a labourer as upon whether he has gauged long enough to have obtained the necessary experience and skill," I should like to say that in nearly every consignment I test, the cement varies a good deal, and the quantity of water required for gauging one lot would be altogether unsuitable for another lot.

I am glad the writer of the article advocates laying down the cement in bulk for a month or two, not because it is necessary *but as a safeguard*, as he puts it.

My experience has taught me that when not absolutely necessary, placing the cement in bulk on a wooden floor and occasionally turning it during three or four weeks will improve it very considerably, and this is proved by the higher tensile strain obtained.

But, in conclusion, I would suggest that it would be very poor policy for labourers to test cement to detect its improper mixing, burning, and grinding by labourers, as an experienced tester should do the testing. ROBERT H. REED.

County Bridge Works,
Fordingbridge, Hants.

SIR,—Referring to Mr. Line's letter last week, if he has any difficulty in getting his cement tested in Birmingham, and would prefer having an operative to test cement for himself, he could probably get the address of some one who would give such training or recommend a tester already trained, if he applied to firms supplying the necessary apparatus, such as Messrs. Townson & Mercer, 34, Camomile-street, E.C. "CEMENT."

SIR,—We notice a letter from Mr. Charles A. Line, local concessionaire of the National Opalite Glazed Brick and Tile Syndicate, who is making enquiries about the use of Portland cement for fixing Opalite. If he will apply personally to the Adamant Co.,

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Ltd., Commercial-street, Birmingham, or the British Opal Wall Glazing Co., Ltd., 12, Warkmouth-street, London, he will find they can fix Opalite without Portland cement or Robinson's, and guarantee it not to swell and displace the opal; a process which, however, has not been secured in the cheap manner he indicates, but at great cost of both labour and money.

Large quantities of this work have been executed in Birmingham and elsewhere. J. WILKINSON.

"GILLOW'S."

SIR,—We are greatly obliged to you for the flattering notice of our little book contained in your journal of the 3rd inst.

With reference to the concluding paragraph, viz. :—

"If Messrs. Gillows wish to retain their hereditary position, however, there is one move which they will probably have to make, to keep with the times, viz., to go to first-class artists for designs, and to give names and the individual credit to the designers. Hitherto, if we are not mistaken, they have gone upon the old system of putting out furniture as the design of the firm and not of individual artists; a system which, for the highest class of work, is doomed :—"

We desire to say that in our studio we possess artists of exceptional ability, a fact you would readily admit if you will favour us with a visit to our galleries. There is no concealment of an artist's name; on the contrary, in the case of any important work, we invariably introduce him to the client. It may, perhaps, be interesting for you to know that many of the most successful designers of the present day have passed through our studios.

GILLOW & CO.

The Student's Column.

GAS AND GAS FITTINGS.

6.—PRODUCER-GAS MANUFACTURE, MOND GAS, OIL-GAS, AIR-GAS, ENRICHMENT WITH LIGHT OILS.

PRODUCER-GAS MANUFACTURE.—The description of producer-gas obtained by blowing air through heated coke has already been described as a by-product in the old process of water-gas manufacture. Instead of separately making a high-class water-gas and a low-class producer-gas by alternately blowing air and steam through the heated fuel, a higher class producer-gas, consisting of water-gas and the producer-gas previously described, may be made by passing a regulated mixture of steam and air through the fuel, the heat evolved by the combustion of the carbon with the atmospheric oxygen being made to balance the heat absorbed during the decomposition of the steam. An excess of air has to be used to compensate for loss of heat through unavoidable causes. A large number of generators or producers have been invented to manufacture gas of this description, and the gas produced is usually known by the name of the inventor of the plant—*e.g.*, Mond gas, Siemens gas, Dowson gas, &c.

In some producers anthracite or a more bituminous fuel is used instead of coke, as, for instance, in the Mond producer, in which cheap coal slack is employed; and the hydrocarbon gases evolved from the fuel enrich the producer-gas to a certain extent, and increase its value. The tar may be recovered by cooling and washing the gas, or may be destroyed by passing the gas through a sufficient thickness of heated coke.

The following table shows approximately the composition and relative heating values of natural gas and of the gases most commonly used in this country for lighting, heating, and motive power; but it must be remembered that in every case the composition of the gas is variable :—

	London Coal-Gas.	Natural Gas of U.S.A.	Water-Gas.	Mond Gas.	Dowson Gas.	Siemens Gas.
Hydrogen	52·85	20·62	49·17	24·8	18·76	8·6
Methane.....	33·88	73·28	·31	2·3	0·31	2·4
Unsaturated Hydrocarbons....	3·97	4·30	nil	nil	0·31	nil
Carbon monoxide	5·34	1·00	43·75	13·2	25·07	24·4
Carbon dioxide..	nil	0·80	2·71	12·9	6·37	5·2
Nitrogen	3·96	nil	4·05	46·8	48·98	59·4
	100·00	100·00	100·00	100·0	100 00	100·0
Gross Calorific value, B.T.U. per cubic foot..	624	700	304	155	150	135

The difference between the heating value of coal-gas and carburetted water-gas of similar illuminating power is shown by the following figures published by Dr. Colman :—

	Coal-Gas.	Carburetted Water-Gas.	
Illuminating power.....	17·31	.. 17·46	candles.
Heating value (gross)....	153·9	.. 142·5	calories per cubic ft.
" (net)	145·7	.. 132·9	

"To convert the calories into British thermal units multiply by 4 (or, more correctly, 3·968).

The table (see below) given by Bryan Donkin in his book on "Gas Engines" is interesting as showing the variations in the composition of the coal-gas supplied in different localities. The analysis of London gas supplied by the Gas Light and Coke Company needs revision, as the carbon monoxide now commonly amounts to 9 or even 12 per cent., owing to the addition of large proportions of carburetted water-gas.

Producers.—In the older forms of producer the fuel usually rested on firebars through which the air supply entered. In order to make the draught sufficiently powerful to carry the producer-gas forward an overhead cooling tube was provided. The gas ascended to this tube, and after being cooled was allowed to descend, the weight of the cold descending gas being sufficient to create a "pull" on the hot gas ascending through the fuel, and to thus increase the current of air drawn through the firebars. In these "open" producers the rate of manufacture is slow owing to the slow speed of the air draught, and the small quantity of steam permissible. Better results are obtained by closing the ashpit and admitting regulated currents of air and steam under pressure. The air and steam are supplied together. A jet of steam is blown into a tube, and owing to the force of its impulsion draws air into the tube with it, and the steam and air pass together into the producer. The size of the jet is adjustable, so that the proportion of air to steam can be varied as required. By using a hollow jet of steam instead of the so-called "solid" jet formerly used, a given quantity of steam can be made to draw in a larger volume of air.

Mond Gas.—Hitherto producer-gas has in this country been manufactured on the works on which it is to be used, and is usually consumed while still hot. The promoters of the Mond scheme propose to supply a large area in Staffordshire, including several important towns, with Mond gas for power purposes. The maximum price is to be 3d. per 1,000 cubic feet, when not less than four million cubic feet per quarter are used, and 4d. per 1,000 cubic feet for smaller quantities. It is proposed to distribute the gas in steel mains under an initial pressure of 7 lbs. per sq. in. in order to limit the size of the mains required. The difference between this pressure and that of 1 in. to 4 in. of water under which coal gas is commonly supplied is shown in the following table :—

Weight of a column of water in lbs. per square inch. (Water at maximum density at 3·9 deg. C.)

$\frac{1}{10}$th	in. water	= 0·00361	lbs. per sq. in.
1	in. "	= 0·0361	"
27·7	in. "	= 1·0	"
194	in. "	= 7·0	"
554	in. "	= 20·0	"

According to Sir F. Bramwell, the gas is to be sent out under an initial pressure of about 7 lbs. per sq. in. from the distributing stations, and at the point of delivery to the consumers is to be reduced to about 2 lbs.

Mond gas is a producer-gas made with the aid of an unusually large quantity of steam, about 2½ tons of steam being blown into the fuel for every ton of coal slack consumed. A large quantity of ammonia is present in the gas produced, and this is recovered and subsequently converted into sulphate of ammonia, the sale of which is expected to almost cover the cost of the coal slack.

Oil-Gas.—Instead of being used for the manufacture of carburetted water-gas, oil may be directly decomposed into a gas very rich in illuminating hydrocarbons. The oil-gas may be used without admixture with other gas, or may be used for enriching gas of poorer quality.

Pintsch's System and Pope's System.—The oil-gas produced by these systems is extensively used for lighting railway carriages, lighthouses, and buoys. Even after compression it has an illuminating power of about 7½ candles per cubic foot when consumed in the ordinary railway carriage-lamps. A gallon of oil, such as Russian Solar Distillate or Scotch gas oil, yields about 82 cubic feet of 50-candle gas. The gas is stored for use in steel cylinders under a pressure of about ten atmospheres (150 lbs. per square inch). When subjected to this compression about 1 gallon of tarry liquid, known as "hydrocarbon," condenses from every 1,000 cubic feet of gas compressed, and the illuminating power of the gas is reduced from 50 to about 38 candles per 5 cubic feet rate.

The oil-gas is manufactured by vaporising and decomposing the oil in specially constructed retorts heated to a cherry red heat. It is now a common practice to mix about 20 per cent. of acetylene with the oil-gas before compression, the illuminating power of this mixture being double that of the plain oil-gas.

Peebles Process.—By this process, the invention of Messrs. Young & Bell, oil or tar is converted into gas and coke, the gas being washed with oil or tar, which is itself subsequently decomposed into gas and coke. One ton of tar from Durham coal is said to yield 15,000 cubic feet of 25-candle gas and 15 cwt. of good quality coke; and one ton of Scotch gas oil to yield about 22,000 cubic feet of 90-candle gas, the illuminating power being calculated from the enriching value of the gas when mixed with low quality gas. About 5½ cwt. of hard graphitic coke is obtained per ton of oil.

Oil-gas is so rich in heavy hydrocarbons that it burns with a very smoky flame in burners which are suitable for coal-gas, and has therefore to be consumed in burners with very small orifices, such as the No. 0 or No. 00 Bray burner, and at a rate of about 1 cubic foot per hour. Professor Lewes gives the following as the composition of oil-gas as

Chemical Composition of Coal-gas in Various Cities and Towns in Percentage by Volume.
(Donkin's "Gas, Oil, and Air Engines.")

Constituents in Gas. Percentage by Volume.	London Gas Light and Coke Co.	London Society of Arts Trial, 1838.	Manchester.	Kilmarnock Trial. Professor Kennedy.	Gas Motoren Fabrik Cologne (Slaby).	Bonn (Clerk).	Dresden (Schöttler).	Hanover (Schöttler).	Hoboken, New York (Brookes and Steward).	Paris (Peclet).	Paris (Witz).
Heavy Hydrocarbons....	4·41	3·77	6·46	5·55	3·10	4·75	3·00	3·17	6·60	5·80	5·50
Marsh-gas, CH_4	37·64	37·34	34·90	42·80	34·40	43·12	33·40	37·55	37·30	33·10	32·30
Hydrogen, H	47 99	50·44	45·58	43·60	56·90	39·80	48·70	46·27	33·50	50·10	52·20
Carbonic Oxide, CO	3·75	3·95	6·64	4·30	5·20	4·66	8·00	11·19	4·30	6·30	5·60
Carbonic Acid, CO_2	—	0·51	3·67		—	3·02	1·50	0·81	2·70 and impurities	1·50	—
			H_2S								
Oxygen, O.....	0·26	—	0·29	1·05	—	—	1·40	—	1·40	0·50	—
Nitrogen, N	5·95	3·98	2·46	·70	—	4·65	4·00	1·01	8·20	2·70	3·80
Totals	100·00	100·00	100·00	100·00	100·00	103·00	100·00	100·00	100·00	100·00	100·00

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made by the Pintsch and Young systems respectively :—

Composition of Oil Gas.

	Pintsch Gas.	Young Gas.
Unsaturated hydrocarbons	35·65	43·83
Saturated hydrocarbons	45·37	36·30
Hydrogen	12·44	16·85
Carbon dioxide ...	0·74	0·63
Carbon monoxide	0·60	0·00
Oxygen	2·00	1·14
Nitrogen	3·20	1·25
	100·00	100·00

Air Gas.—In America, illuminating gas is often made by passing air at ordinary temperatures over light petroleum spirit. This is, however, a crude and wasteful method of using the oil, and many accidents have occurred owing to an explosive mixture of air and petroleum vapour having been formed in some part of the apparatus.

The Kitson Light.—This light is produced by heating a large mantle to incandescence by means of an oil flame rendered non-luminous by causing the oil vapour to draw in by its injecting action the necessary volume of air just before it enters the burner. The mantle is similar to that used for the Welsbach incandescent gas light, but is larger. The oil is placed in a cylinder, and air is then pumped into the cylinder. The pressure of air in the cylinder (about 50 lbs. per square inch) forces the oil up a pipe of very small bore, and injects it into the lamp, where it passes through a tube located a short distance above the mantle and, heated by the waste combustion products, is vaporised. The compressed air is not used for combustion of the oil. The apparatus is compact, and has the advantage of not requiring any distributing pipes. It is, therefore, useful for lighting works not supplied with gas, or for works of a temporary nature where a powerful light is required without incurring the expense of laying gas service-pipes. The hissing noise made by the lamp makes it unsuitable for most indoor work. The illuminating power of the light is about 1,000 candles, and the estimated cost of the oil used is about 1d. per hour.

Enrichment of Gas with Light Oils.—Instead of decomposing heavy oil into a rich gas and using it to enrich low quality gas, the gas may be passed over liquid light oil, or brought in contact with oil which has been vaporised, but not decomposed, with the aid of steam. These light oils are mostly distillates from American petroleum, and are sold under fancy names. *Carburine* has a boiling point of about 70 deg. C. and a specific gravity of about 0·68. *Gasoline* has a boiling point of about 40 deg. C. and a specific gravity of about 0·65. *Petroleum Spirit* a boiling point of about 95 deg. C. and a specific gravity of about 0·70. Commercial *90 per cent. benzol* contains, according to Butterfield, about 70 per cent. benzene and 25 per cent. toluene, and has a boiling point between 82 and 112 deg. C., while its specific gravity varies from 0·882 and 0·885.

The process of enriching gas with oil vapour is termed "carburetting." In Germany, benzol is largely used for carburetting plain water-gas. The gas may be carburetted with light oils at atmospheric temperatures, but in this country it is usual to vaporise the oil by steam heat. In London, all gas supplied north of the Thames is required by Act of Parliament to have an illuminating power of not less than 16 candles when consumed in a standard argand-burner at a rate of 5 cubic ft. per hour. The gas from the coal used in London has an illuminating power of 14 to 15 candles, and it is therefore necessary to raise it to about 16½ candles by carburetting it with light oil or by mixing it with rich carburetted water gas. Mr. H. Leicester Greville states that 1 gallon of petroleum spirit vaporised in a Price carburettor is capable of enriching 10,286 cubic ft. of coal gas from 16 to 17 candle-power.

BOOKS RECEIVED.

BY-LAWS AS TO HOUSE DRAINAGE, &c, MADE BY THE LONDON COUNTY COUNCIL. Annotated by Gerard J. G. Jensen, C.E. (The Sanitary Publishing Co.)

THE MANAGEMENT OF ENGINEERING WORKSHOPS: Six lectures by Arthur H. Barker. (Published by the Institution of Junior Engineers.)

NORWEGIAN GRANITE AND STONE.

THE export of hewn granite from Norway last year was somewhat less than in 1899. The same may be said of the selling price, which, both in and out of the country, was somewhat lower. The quantity exported in 1900 from the Smaalene granite quarries was 86,499 tons, of which 48,291 tons were shipped at Fredrikstad, 29,343 tons at Fredrikshald, and 8,865 tons at Sarpsborg. In addition to these totals there were exported from the Drammen Fjord 8,694 tons, from Christiania 4,163 tons of so-called Labrador, from Laurirg 4,035 tons, and a little from other places. The greater part goes to the United Kingdom. In recent years Germany has taken but little, preferring, it is said, to develop her own quarries. The largest Norwegian exporters have formed an association for the export of kerb-stones only. There exists also a workmen's association, called the Granite Exporters' Association, to control labour, employing about 3,600 men on the east side of the Christiana Fjord, but less than half of these work north of the Swedish frontier, the rest over the frontier, in Sweden. Two strikes, each of two and a half months' duration, occurred in 1900. The total value of the granite exported is about 115,000*l.* The quarrying of soapstone is reported on the increase. Nearly all of it is used in Christiana for building and decorative purposes, as also for fireplaces and stoves and for fireproof stone. The export of soapstone has also begun. One firm shipped 1,250 tons last year. Very little marble was reported to have been quarried in 1900. The bulk of the Norwegian exporters of kerbstone have formed an association under the style of "The Norwegian Kerb Company," with a head office in Christiana. The object of the company is to regulate the production of kerb in accordance with the demand, and also to control all sales of same, which are now effected through the company's office. The annual report of Mr. Berentsen, British Vice-Consul at Stavanger, includes the following laconic passages :—"The Stavanger Stenhuggerier, mentioned in my last report as working paving stones and stones for house-building purposes, has delivered some paving stones in this town, and as far as I know it proved a success. If any town or Corporation in the United Kingdom is in want of paving stones I would recommend them to apply to the above address. The brick-stone manufactories have been working very hard at Sandnæs, near here. If brick-stones are required anywhere in the United Kingdom, I recommend application to the Sandnæs factories. Addresses, samples, and prices may be had on application to the Vice-Consulate."

GENERAL BUILDING NEWS.

RESTORATION OF ST. MARY'S, CARDINGTON.—The demolition of the body of this church, together with the old tower, has been made necessary by the unsafe condition of much of the masonry in the south, east, and west walls of the south aisle. It was at first intended to rebuild the tower on its old site, but the soil had been so honeycombed by interments that this was considered inadvisable, and it was then decided to throw the tower-site into the nave, and to add a new tower to the west end, a north aisle being also added. The old vault of the Whitbread family, north of the old tower, was filled up, and a north transept—forming a memorial chapel—was erected over it, for the reception of the principal Whitbread monuments. The old windows in the chancel have been reconstructed in precisely the same position as before, with the old materials. A number of large and vigorously designed ancient gargoyles have been introduced into the external cornice of the chancel; and a few of the old leaden water pipes—bearing the dates, "S.W. 1701," "S.W. 1780."—have been again used round the chancel roof. Internally, the large Norman arch, which divided the old tower from the nave, has been removed to the west end of the nave; which opens into the new tower. It has been most carefully reconstructed stone by stone, the only change effected in it being the recessing of the edges, converting the arch into one of a double order. The new tower rests on a bed of concrete, 45 ft. square by 11 ft. thick. The work of the tower foundation, as well as that of the foundations of the four nave pillars, was carried out from plans prepared by Mr. James Briggs, M.Inst.C.E., Derby. In the construction of all portions of the church the best and most durable materials have been employed. The stone for the walls is from Tansley Moor, Matlock, and is laid in random-coursed work; all the new dressings are of Ketton stone (Rutlandshire); the base on which the oaken pulpit stands is from Beggar's Well, Staffordshire; the steps on which the font stands are of stone from Hollington, Staffordshire, while the font itself is of hard white Mansfield stone. No ordinary mortar, nothing but the best cement, has been used anywhere in the building. The outer roofs and waterpipes are of copper, and the locks are of gun metal. The whole of the work of plans and designs—including new tower superstructure, north aisle, transept, and south porch, and all new architectural features and details—has been entrusted to Mr. George Highton, architect. In the belfry stage are eight bells, which have been recast by Messrs. Taylor, of Loughborough, with the ancient and rather curious inscriptions. On the south side of the tower is the sundial erected by Samuel Whitbread in 1782, with the legend "Our days upon earth are as the dew." A few feet below this dial is a smaller one, discovered in the south wall of the churchyard, and which is a rare and well-preserved example of an Anglo-Saxon sundial. The gnomon is wanting, but the dial is otherwise in comparatively good condition, and at one point bears a small cross indicating the chief Saxon hour of prayer.

VAGRANT WARDS, LEEDS.—The foundation-stone of the proposed vagrant wards at the Leeds Workhouse was laid on the 22nd ult. The new buildings, which will probably cost about 10,000*l.*, are being erected by Mr. J. T. Wright, from designs of Messrs. Thomas Winn & Sons. They will stand in the lower part of the workhouse grounds, near to Gledhow-road, and will be of brick, with stone dressings, and glazed brick inside. There will be thirty sleeping cells for the men and twenty stone-breaking cells on that floor, together with twenty sleeping cells for females, as well as lavatories, bathrooms, &c.

TECHNICAL INSTITUTE, CLEETHORPES. — The foundation-stone of the new Technical Institute for Cleethorpes was laid on the 23rd ult. The building is being erected by Mr. W. Ion, and will, it is estimated, cost 2,000*l.* It is to include classrooms, laboratory, lecture theatre, and other necessaries to meet the demands of the times. It will be a two-story structure, 40 ft. high. Mr. F. Croft is the architect.

WORKHOUSE INFIRMARY, DORKING.—The new infirmary which has been erected for the accommodation of the sick poor in the Dorking Union was opened a few days ago. The building, which has been erected at a cost of over 10,000*l.*, is situated at the rear of the workhouse buildings, in which up to now the sick have been nursed in a series of sick wards. The structure, which is of red brick with stone dressings, is of a total length of 185 ft. and of varying depths, its deepest point extending to 38 ft. The centre part is carried a story higher than the two side wings. On the ground floor, which is approached by a vestibule and entrance hall, are situated male and female wards, bathrooms, &c., those for females being situated on the left hand side and for males on the right. The first floor is approached by two staircases. Here the wards are divided into two blocks, one for males and the other for females, there being also separate wards for patients of both sexes in acute suffering, each set of wards being provided with its own bathrooms and sanitary annexes. The second floor is devoted to the nurses' bedrooms, sitting-rooms, bathroom, &c. Altogether there is accommodation in the new building for about sixty patients—thirty male and thirty female. In addition there is a lying-in ward on the ground floor at the rear of the main building, at each end of which is a tower forming the sanitary offices. The largest wards are those on the first floor, which measure 36 ft. by 24 ft., those on the ground floor being about 24 ft. by 24 ft. Mr. Percy Adams, of London, was the architect, and Messrs. Kerridge & Shaw, of Cambridge, the builders.

ENLARGEMENT OF HOSPITAL, MIDDLESBROUGH.—The Marchioness of Zetland opened, on the 29th ult., a new wing which has been added to the North Ormesby Cottage Hospital, Middlesbrough, at a cost of over 4,500*l.* In the interior, the original passage entrance has been enlarged into a hall, the floor of which is covered with a marble mosaic pavement, and the hall gives access to corridors branching to the right and to the left. In addition to new wards on the first floor, there are seven rooms for the use of the nursing staff as sitting and bedrooms, and above these seven other rooms for the use of the large staff of servants. A part of the original building has been converted into a temporary operating-room. Mr. J. Mitchell Bottomley, of Middlesbrough and Leeds, the architect to the institution, has superintended the work; the contractor being Mr. King, of North Ormesby. Mr. E. Jones, of Middlesbrough, has acted as the clerk of works.

FIRE STATION AT HOMERTON.—Mr. J. D. Gilbert, Chairman of the Fire Brigade Committee of the London County Council, recently laid the memorial stone of a new sub-station now being erected at High-street, Homerton. The site cost 1,750*l.*, and the estimate of the architect, Mr. W. E. Riley, was 8,000*l.* Messrs. Martin, Wells, & Co. undertook the contract for 8,126*l.*

CHADWELL LUNATIC ASYLUM. — The plans for this asylum, which was officially opened on the 1st inst., were originally prepared in 1894 by Mr. Lewis Angell, the then Borough Engineer for West Ham; but were not finally approved by the Commissioners of Lunacy until May, 1897. The foundations for the buildings were constructed and the east entrance lodge erected by Messrs. Gregar & Son, builders, Stratford, between July, 1897, and July, 1898, at an expenditure of 13,728*l.* 9s. 8d. On August 3, 1898, the foundation-stone of the first portion of the buildings, for which the tender of Messrs. Leslie & Co., Ltd., contractors, Kensington, in the sum of 209,531*l.*, had been accepted by the committee, was laid. The buildings cover an area of about ten acres, and have a width of about a quarter of a mile from east to west, and one-eighth

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of a mile from north to south, the main corridors being about a mile in length. They provide accommodation for 800 patients with the necessary staff, and consist of administration block, forming the centre of the buildings, containing in the front the chief medical officer's, steward and clerk's offices, committee-rooms, waiting-rooms, dispensary, laboratories, museum, library, billiard-room, and apartments for assistant medical officer, and the matron's rooms. Behind these, forming the centre of the block, is the recreation hall, with floor space 80 ft. by 40 ft., and a stage 40 ft. by 21 ft., and the rooms for male and female attendants, the kitchen, serveries, sculleries, dairies, vegetable, meat, and general stores, bakery, with flour store over, sewing-room, and other offices. At the rear are the laundries, boiler and dynamo houses, water tower, and workshops for various trades. The patients' quarters are built on both sides of the administration block, to which they are both connected by extensive corridors. The accommodation is similar on both sides, and includes sick and infirm, acute, epileptic, and chronic blocks. Large dayrooms and dormitories, baths, and sanitary accommodation are provided in each block. The dayrooms vary in size from 90 ft. by 27 ft. to 30 ft. by 20 ft., and the dormitories from 45 ft. to 80 ft. long by 28 ft. wide. In addition to the above, an isolation block has been erected with male and female wards, convalescent-rooms, attendants' rooms, kitchen, scullery, sanitary offices, &c. The officers' residences are erected some little way from the main buildings, and consist of detached houses for medical superintendent, steward, chief attendant, and engineer; eight semi-detached houses for married attendants, and lodges at the north and south entrances. The church is situate in the centre of the site, about 120 yards from the front of the administration block, and has seating accommodation for 600 persons. The water supply for the domestic purposes of the asylum is obtained from an artesian well in the base of the water tower. In sinking the well, chalk was reached at a depth of 210 ft., and the boring was continued 140 ft. into the chalk, making a total depth of about 350 ft. The normal level of the water is about 70 ft. below the ground surface, and it is first raised by a compressed-air plant, driven by electric motors, into a tank with a capacity of 11,000 gallons in the base of the water tower, and from thence again raised by an electrically driven three-throw pump a height of about 90 ft., into the large storage tank, capable of containing 32,000 gallons, at the top of the water tower. From this tank a "circuit main" is run round the whole of the buildings, in each block of which a galvanised iron tank is fixed with connexions to the "circuit main." From these tanks, branch mains and services are taken to supply all the various fittings, fire hydrants being fitted throughout the buildings and in the yards. The fire installation is arranged on the "ring main" principle, and the pressure in the pipes is maintained by means of a large steam fire-pump in the engine-room. In case of failure of this pump, the pressure from the water-tower can be placed on the main, and the supply obtained from the water company to meet cases of emergency. A considerable proportion of the rainwater from the roofs of the buildings will be collected for laundry purposes by a separate system of drainage, and discharged into a covered reservoir, 91 ft. by 30 ft. by 13 ft., with a capacity of 200,000 gals. From thence the water passes through filters and is raised by an electrically-driven pump into tanks in the laundry blocks capable of holding 18,000 gals. The buildings are heated throughout on the low-pressure hot-water system. A multitubular heater (Messrs. Z. D. Berry & Sons' improved pattern), supplied with steam from the main boilers, is fixed in the heater-room of each block for generating the necessary hot water. Flow and return mains are taken from the heaters and connected up with the various radiators fixed throughout the buildings. The boilers are constructed to work at a pressure of 120 lbs., and they were supplied by Messrs. Spurr, Inman & Co., of Wakefield. A Green's Economiser of 160 tubes is placed at the rear of the boilers. The electrical installation, including the wiring of the buildings and the telephones, has been carried out under the superintendence of Mr. J. K. Bock, Borough Electrical Engineer. The number of lights wired for is over 3,000, the work being carried out by the Council's own workmen. From the main switchboard in the engine-room, a separate concentric, lead-covered, paper-insulated cable is run to a distribution board in each block, and also a distribution board in each detached building. From these boards the branch circuits to supply the lights are taken, the wires being drawn into steel tubing, so arranged with joint boxes, pulling-in boxes, &c., that, in the event of any failure in the circuit, the wires can easily be replaced without disturbing any plaster or woodwork, &c. In every case the rooms and corridors depend on more than one circuit for their supply. Hot-water supplies are provided for all baths, sinks, slop sinks, &c., from multitubular heaters fixed in the heater-rooms of each block. The heaters are of similar type to those used for the heating apparatus. The laundries are fitted with five washing machines, four hydro-extractors, soaking and rinsing tanks, boiling coppers, washing troughs, three box mangles, ironing machines, ironing stoves, &c. The drying closets contain seventy-eight drying horses, all heated by steam, the horses being constructed on the "over-carried" principle. The machinery and shafting throughout is driven by electric motors. The work in connexion with the heating apparatus, hot and cold water mains and services, steam and condenser mains, laundry machinery and apparatus, cooking apparatus, kitchen fittings and bakery, fire installation, &c., has been carried out by Messrs. Z. D. Berry & Sons, the Albion Works, Westminster; and the artesian well and compressed-air plant in the water tower by Messrs. C. Isler & Co., Bear-lane, Southwark. The total cost of the whole of the works when completed is estimated at 300,000*l.*

CORNWALL COUNTY ASYLUM, PROPOSED EXTENSIONS.—Additions are to be made to the present County Asylum buildings at Bodmin, Cornwall, comprising separate detached blocks for sick and infirm, reeent and acute, chronic epileptic, and other classifications of patients, together with assistant medical officer's residence, waiting-rooms, recreation and dining-hall, kitchens, offices, staff-quarters, workshops, stores, boiler-house, &c. Mr. Silvanus Trevail, of Truro, is the architect, and the tender of Messrs. Pethick Bros., of Plymouth, has been accepted at 87,973*l.*

PUBLIC BATHS, LATIMER-ROAD, WIMBLEDON.—The site of this building has a total frontage of 200 ft. and a depth of 100 ft. Of this 140 ft. have been occupied by the present buildings, leaving a vacant site with 60 ft. frontage for extension, if required. Separate entrances are provided for men and women under the control of a central ticket office leading to waiting rooms for each sex. By this arrangement it will be possible, by locking respective doors, for men to use their slipper baths when women are using the swimming bath, and *vice versa*, with perfect privacy. The swimming bath hall is 120 ft. long and 58 ft. wide and the pond has a water area of 100 ft. by 40 ft. with a depth of water varying from 6 ft. 6 in. to 3 ft. 4 in. The water is warmed by the injection of steam. A shower and foot bath are provided for bathers using the swimming bath. There are sixty-seven dressing boxes ranged round the swimming pond, over which a gallery is provided to enable the public to view swimming entertainments. During the winter months the pond will be floored over, and the hall will be available for meetings, dances, concerts, &c., with seating accommodation for 700 on the ground floor and 300 in the gallery. In connexion with this arrangement an additional entrance is provided with ticket office at the south end of the building, to avoid any interference with the working of the slipper baths, which will be open throughout the year. Thirty slipper baths are provided, viz., twenty men's and ten women's, approached from the respective waiting rooms. The superintendent's office is placed between the men's and women's entrances. The establishment laundry is connected with the various departments by means of a covered way. It is fitted with the most approved steam appliances, worked by an engine in the basement, for washing the towels, bathing dresses, &c., used in the building. The whole of the building is warmed by steam pipes and radiators, and steam is also used for heating the water used in the slipper baths and laundry. There are two boilers fixed in the basement, viz., a 22 ft. Lancashire and a 15 ft. Cornish; the former is capable of supplying the whole of the steam required, and the latter will be held in reserve. The whole of the building is fitted with the electric light, and the current is supplied from the Wimbledon Urban District Council's mains. Mr. R. J. Thomson, Hill-road, Wimbledon, is the architect.

WESTINGHOUSE WORKS, TRAFFORD PARK, MANCHESTER.—The Lord Mayor of London recently laid the corner-stone of the Westinghouse Works at Trafford Park, Manchester. The works are situated on a portion of the old Trafford Park estate, a site covering about 130 acres having been acquired for the purpose. The buildings run almost due north and south; the northern ends are permanent and brought up into line; the other ends might be termed temporary, as it is from here that the buildings will be extended and increased in length as required. The works proper are located in six buildings, all of rectangular form. On the extreme east is the iron foundry, 170 ft. wide and 580 ft. long, where plant will be installed capable of turning out and handling the huge castings required in the largest sizes of electric power machinery. Next to the iron foundry are the smaller brass foundry, malleable iron foundry, pattern shop, steel foundry, and forge. The two last are built end to end, forming a building 170 ft. wide by 580 ft. long. The next building is the machine shop. It is 430 ft. wide by 900 ft. long, and will be equipped with the most modern machine tools, large and small, all electrically operated. It is divided longitudinally into bays. The side bays are arranged with two stories, and are arranged for the machining and finishing of the smaller parts of machinery; the centre bay is arranged for the machining of large parts and the erection of the largest plant manufactured. In addition to the six buildings which have been mentioned, there are two others—one the office building, 50 ft. wide by 250 ft. long, set in front of the machine shop; and the other, box factory and stores, 60 ft. wide by 270 ft. long. The office building will accommodate the clerical staff, shipping department, drawing offices, and also have certain fireproof departments in which the works records will be kept. Houses for the workmen are being built by the Trafford Park Dwellings Company, Limited, who have acquired some 120 acres of land, whereon will be erected some 1,100 dwellings. About 300 of these are completed, and 300 more are being rapidly pushed forward. Arrangements are also being made for the erection of some better-class cottages for the use of foremen, for the erection of a large hotel to accommodate commercial travellers, also schools, clubs, and recreation grounds. In all there will be some 5,000 workmen employed, the works being mainly devoted to the manufacture of gas engines, dynamos, motors, converters, transformers, &c. The engineer and architects are Mr. Thomas Rodd, of Pittsburg, U.S.A., and Mr. Charles Heathcote, architect, Manchester. Mr. Charles Heathcote is also architect for the dwellings referred to.

FOREIGN.

FRANCE.—The Municipality of Pau has protested so strongly against the retention at the Louvre of the four tapestries sent from Pau to the exhibition at the Petit Palais, that the Government has felt compelled to give way and restore them. This will probably be a precedent for provincial bodies to make similar protests. It seems quite unreasonable that the Government should endeavour to rob local museums to render the Louvre collection more complete.——A statue of Paul de Kock, of all people, is to be inaugurated at Romainville, a suburb of Paris. In England such a writer would hardly have been thought worth a monument. A statue to a very different order of personage, Victor Considérant, was inaugurated on the 4th inst. at Salins.——A new boulevard maritime, or sea promenade, has been opened at Dieppe.——The municipality of Algiers has under consideration a scheme, presented by M. Redon, for the extension and embellishment of the city.——The jury in the competition for a new covered market at Auxerre, have awarded the first premium to M. Dumé (engineer) and M. Cavé (architect).——M. Foucault, architect to the Third Section of Paris Municipal Architectural Department, has been appointed architect to the central administration, in place of the late M. Ulysse Gravigny.——A large group of school buildings has been completed at Bondy. The architect is M. Ancian, a former student of the Ecole de France at Rome.——M. Camille Lefèvre, the sculptor, has just completed his model for a fine bas-relief in stone intended for the Mairie of Issy-les-Moulineaux. The subject is the Republic crowned by France.——The Government has authorised the execution of the works required for the completion of the new basin at the port of Fécamp. The estimated cost is 625,000 francs.——We have to record the death, at the age of fifty-nine, of M. Georges Dalbin, architect, a former pupil of Hippolyte Lebas and of M. Ginain. He carried out numerous works in domestic architecture, and in 1887 obtained, in collaboration with Carrier-Belleuse, the third premium in the competition for the monument to Lamartine at Macon.——We have to record also the death, at the age of 50, of M. F. Kaheun, architect, and inspector of the Louvre Palace. He was an architect of talent, but chiefly known in private practice.——We have also to announce the death, at Tallard (Hautes Alpes), of the well-known etcher, Eugène Champollion. He had etched several of the leading pictures of the day for reproduction. He made the illustrations for "Salambô" and for "Daphnis and Chloe," and the etched portraits of Sarah Bernhardt and Chevreul. He died at the age of fifty-three.

AUSTRALIA.—The buildings for the Victorian Gold Jubilee Exhibition, Bendigo, Victoria, have been commenced.——A Roman Catholic church is to be erected at Galong, New South Wales, in accordance with designs by Messrs. Sheerin & Hennessy, architects, of Sydney.——The festivities in connexion with the Royal visit have seriously affected building operations in Sydney and suburbs, but there are now signs of a revival.——A new Central railway station is to be built in Devonshire-street, Sydney.——The design of Mr. J. White, of Sydney, has been accepted for the West Australian Fallen Soldiers' Memorial. The monument will be erected on Mount Eliza, in Perth Park. The selected design shows a granite base surmounted by a group of statuary, depicting an Australian volunteer defending with his bayonet at the "ready" a wounded comrade who is quenching his thirst from a water-bottle. Bronze tablets are to be affixed to the four sides of the base.——To supply water in certain arid districts in New South Wales, the Government has sunk upwards of ninety bore holes. The most expensive one is at Dolgelly, and it cost about 10,000*l.*——Extensive improvements are about to be made in the groundt surrounding the Roman Catholic cathedral as Bendigo.

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MISCELLANEOUS.

KING'S COLLEGE, LONDON. — The following is the result of the examinations in the evening department in Architecture and Building Construction in order of Merit: — *Building Construction.*—Silver Medal and 3*l.* in books, Mr. F. J. Jones; Bronze Medal and 2*l.* in books, Mr. G. H. Briggs; 1*l* in books and Certificate of Distinction, Mr. G. Thompson. Certificate of Distinction, Messrs. P. Luker, J. J. Crowe, P. J. Black, H. F. Berry, W. Fenn, and J. H. H. Ixer; Certificate of Merit, Messrs. H. A. Alexander, F. Davies, J. N. Horsfield, and J. A. Meikle. *Constructional Drawing.*—3*l.* in books and Certificate of Distinction, Mr. W. Nicholls; 2*l.* in books and Certificate of Distinction, Mr. A. J. Meikle; 1*l.* in books and Certificate of Distinction, Mr. E. L. Hampshire; Certificate of Distinction, Messrs. A. Gomme, H. H. Ixer, A. Bale, and H. Berry; Certificate of Merit, Messrs. J. J. Crowe, A. E. Bowles, P. J. Black, and G. H. Briggs. *Quantities*—3*l.* in books and Certificate of Distinction, Mr. F. J. Jones; 2*l.* in books and Certificate of Distinction, Mr. F. Davies; 1*l.* in books and Certificate of Distinction, Mr. H. Berry; Certificate of Distinction, Messrs. J. Black and J. N. Horsfield; Certificate of Merit, Messrs. F. Hartnoll, H. A. Alexander, and E. L. Frost. *Sanitary Construction.*—(Sir George Faudell Phillips's Medal not awarded.) *History of Architecture.*—Silver Medal and 2*l.* in books, Mr. E. L. Hampshire; Bronze Medal and 1*l.* in books, Mr. A. E. Brooker; Certificate of Distinction and 1*l.* in books, Mr. S. A. Meikle; Certificate of Merit, Messrs. J. A. Gillett, W. Fenn, G. W. Rogers, H. Byron. *Architectural Sketching Class.*—Bronze Medal and 1*l.* in Books, Mr. A. E. Brooker. *Architectural Studio.*—Gold Medal and 3*l* in books, Mr. E. L. Hampshire; Silver Medal and 2*l.* in books, Mr. A. E. Brooker. *Wood-Carving*—Scholarship for one year and Silver Medal, Mr. R Toms; Scholarship for two terms and Bronze Medal, Mr. H. S. Jones; Scholarship for one term, Mr. M. S. Mathers.

"GREAT EASTERN RAILWAY TOURIST GUIDE."—The sixpenny tourist guide to the Continent issued by the Great Eastern Railway Company, is intended as a companion to a holiday trip by their route. It contains a good deal of information, many illustrations, and plans of Brussels and Amsterdam. The general folding map at the beginning has been put in so that it opens upside down, an inconvenience which should be avoided in future issues.

PROPOSED IMPROVEMENTS, HALIFAX.—A Local Government inquiry was held at the Halifax Town Hall recently, before Mr. E. A. Sanford Fawcett, A.M.I.C.E., with respect to an application for powers by the Halifax Corporation to borrow 7,825*l.* for the new police-station, 105,722*l.* for street improvements, 3,719*l.* for gas department, 15,926*l.* for sewerage works, 1,272*l.* for the purchase of a site at Skircoat for the purpose of a refuse destructor, a total of 134,464*l.*

BRICKMAKING IN FORMOSA.—This industry is growing, according to a recent consular report, and in late years the Japanese have encouraged the use of kiln-burnt bricks in place of the sun-dried mud bricks, of which nearly all the one-storied buildings had been erected by the Chinese. The mud bricks are usually made in the vicinity where a building is being erected. The kiln-burnt bricks used by the Japanese are made from clay, which is good and abundant on the island. The material is mixed in a pit consisting of a circular roadway sunk in the ground a half foot or so, around which tramps an ox. Water is added to the sand and clay, and the mixture is trodden by the ox till it reaches the right consistency. As a rule, for the ordinary building brick, three parts sand to seven parts clay are used. The green bricks are formed in suitable wooden moulds operated by hand. An ordinary workman can mould 500 to 800 a day, and some operators, exceptionally expert, run as high as 1,200. These workmen are paid 1 to 1.50 yen (50 to 75 c.) a thousand. The majority of the Japanese factories have well-built, permanent kilns, each with an average monthly capacity of about 100,000 bricks. Formosa coal, at about 4 yen (2 dols.) a ton, is used as fuel. The finished brick is in demand at 7 to 11 yen (3.50 to 5.50 dols.) a thousand. Occasionally there is an order for some special shape or quality, and these bricks will bring as high as 20 yen (10 dols.) a thousand. The chief demand, however, is for a good quality building brick at about 10 yen (5 dols.) a thousand. The labour employed is chiefly Chinese; Japanese are utilised only as overseers, &c. Chinese day labour receives from 30 to 40 sen (15 to 20 c.) and Japanese 30 yen (15 dols.) a month and upward. At present there are twelve large, permanent factories owned or controlled by Japanese, with a total monthly production of about 2,500,000 bricks. In addition, there are forty or fifty native factories producing brick, roofing, and floor tiles. Among the largest firms are the Samejima Shokai (head office, Daitotei, North Formosa), with factories at Kentan, Daichokuho, Hokuseiko, Sharyo, and Borvo, North Formosa.—*Engineering and Mining Journal, New York.*

PLUMBERS' REGISTRATION BILL.—In the House of Lords on the 30th ult., Lord Glenesk, in moving the second reading of this Bill, said the object was to establish a system under which plumbers can, if they please, be registered. No privilege was given to a registered workman, but he could not call or represent himself to be a registered plumber unless he was so registered under the Bill. The main object of the measure was similar to the Bills read a second time in 1892 and 1897 and examined by committees in those years. He thought the Bill would be acceptable to their lordships, as it was approved by the opinion of the public.—Lord Kenyon said no doubt the object aimed at was to register plumbers so as to make them as efficient as they could be made. As the Bill now stood it cast on the Local Government Board the formation of a scheme which that Board did not want to undertake. If the promotors of the Bill would prepare a scheme and make it part of the Bill, then it could be introduced next year in a complete form. He had no objection to the Bill being read a second time.—The Bill was read a second time.

PUBLIC IMPROVEMENTS, BLACKPOOL.—On behalf of the Local Government Board, Colonel A. G. Durnford held an inquiry at Blackpool recently into an application made by the Corporation for sanction to borrow 2,690*l.* for works of sewerage, and 2,232*l.* for the formation of so much of a proposed new road from Marton Green to New House Farm as will be within the borough, including the sewering of the same.

THE MANCHESTER SHIP CANAL.—The Canal Company have obtained powers of compulsory purchase of the ground belonging to the Manchester Racecourse Company. The latter sent in a claim for one million sterling, but the result of the arbitration was that Mr. Robert Vigers, the arbitrator, awarded the sum of 262,500*l.* as the price to be paid by the Canal Company for the property. The decision of the Court of Chancery has been upheld by the Court of Appeal. The Act giving the Company power to take the Racecourse provides that possession must not be taken until the end of this year without the consent of the Racecourse Company, and they will not be ready to vacate the property before that date. The report of the engineer to the Canal Company (Mr. W. H. Hunter) states that the depth of water in the canal and docks has been maintained throughout, although it is to be regretted that, comparing one year with another, no diminution whatever of the quantities of sludge and detritus carried down and deposited in the canal and docks has been experienced. The spare steel gates for the 65 ft. locks have been completed and are now being worked in place of the intermediate gates at Barton Locks, which are under repair. The erection of the new offices at Trafford-road has proceeded; the offices are approaching completion, while those at the end of No. 4 dock have been completed and are in use for traffic purposes. Considerable progress has been made with the dock and railway extension works authorised by the Act of 1900. The western portion of the through line of railway has been completed, and a length of the main road on the northerly boundary of the company's property has also been completed and is in use. A portion of the permanent fencing and gates has been erected, the levelling of the portion of the ground purchased from Captain Clowes, which is to be employed for storage purposes, has been completed and is being brought into use. Additional railways and service roads are in course of construction. The embankments and slopes of the canal generally are in good condition.

AUSTRALIAN TIMBER AND TIMBER-GETTING.—The timber resources of the Australian Parent State, although largely wasted in the past, are yet of a most extensive character, and under a proper system of conservation would become as valuable as any in the world. In a report by the Queensland Inspector of Forests, descriptive of a visit to New South Wales, that official states that on the Murray River, dividing New South Wales from Victoria, are situated the far-famed Murray River gum forests, the area of forests extending a distance of about 200 miles on the frontage of that river, but with occasional breaks, and running back from the river on an average of from one to six miles. New South Wales has an area of about 140,000 acres reserved for this timber, most of this country being liable to floods and densely timbered with gum, from the matured tree to the sapling and small plant. As showing the extent of the timber trade in the district, it may be mentioned that during the season December, 1900, and April, 1901, the quantity of timber obtained was 5,503 logs, containing an average of 1,150 superficial feet per log, equal to 6,431,950 ft. of timber, on which royalty is payable of 4,047*l.* 0s. 5d., at 1s. 3d. per 100 superficial feet. The greater portion of this timber was cut on behalf of a Victorian company, and is stacked in depots on the higher banks of the Murray River, pending a rise of water, when it is removed by pontoons and punts, towed by small steamers to Echuca (Victoria), where it is cut into sleepers, mining timbers, and for bridge and building purposes.

THE HOUSES OF PARLIAMENT.—In the House of Commons, on the 5th inst., on the vote to complete the sum of 38,000*l.* for the Houses of Parliament buildings, Mr. Dillon said he did not want luxury of any kind in the House of Commons, but he thought they were entitled to have the conditions under which they had to live there made as little insanitary and deadly as possible. They heard a great deal of insanitary dwellings, but the House of Commons was as insanitary a dwelling as they could find anywhere except in the very purlieus of the city. He was informed by the Kitchen Committee, too, that the accommodation provided for the servants would be a disgrace to any private house. He would be glad to hear from the First Commissioner of Works a statement as to the steps he proposed to take to improve the ventilation and increase the accommodation in the House.—Mr. O'Mara said he joined in the representations of his friend as to the lack of proper accommodation for members and for the servants of the House.—Mr. W. Redmond agreed that the arrangements made for the accommodation of members of the House were very defective, and hoped the recommendations of the Committee would be carried into effect as quickly as possible.—Mr. Akers-Douglas agreed that the accommodation for members was very defective. There was dining accommodation only for 140 members, yet one night recently as many as 300 members had to obtain their dinners in the building. The accommodation in the smoking-room was equally deficient, and in the winter months it was often impossible to obtain a seat after waiting for hours. He was very anxious to see these things remedied, but it was even more necessary to improve the apartments in which officials of the House worked. The conditions under which the telegraph operators worked was a scandal. There was a strong feeling in the House that too much was done for guests and not enough for working members of the House. When the existing accommodation was provided it was not intended that members should give dinners for fourteen or sixteen people constantly during the Session and crowd out those who wished to use the House for business purposes. He would endeavour to see whether that particular portion of the Report which related to the proper provision for the working members and officials of the House could be undertaken this year.—Mr. Malcolm called the attention of the First Commissioner of Works to the want of ventilation in the Committee-rooms.—Mr. Dillon said the state of the Committee-rooms was perfectly poisonous.—The vote was agreed to.

LEGAL.

ZOARS *v.* HARBROW.

THIS was an action for breach of contract originally tried before Judge French at the County Court, and referred by the King's Bench to the City of London Court. It came before Mr. Pitt Lewis, K.C., Deputy Judge. Mr. Holloway was for the plaintiff, and Mr. Deney for the defendant.

The latter, finding that he had underestimated the work, declined to proceed, giving as his reason that the structure was a special one under Section 82 of the London Building Act.

Mr. H. Lovegrove, District Surveyor, gave evidence and his reasons for allowing the tank to be encased, and his view was also taken by Mr. Edward Power, District Surveyor. The defendant called Mr. A. W. Tanner and Mr. H. Parsons.

The Judge decided that the work in question came under Section 61, and not under 82, and ordered the defendant to pay the difference between the amount of his tender and that of Messrs. Mattock, who eventually carried out the work, with costs of the previous trials.

PLUMBERS AND OVERTIME.

AT the Westminster Police-court, on the 31st ult., Messrs. Trollope, builders and contractors, of Grosvenor-road, S.W., were summoned, before Mr. Francis, by John Randall, a plumber in their employment, who sought to recover 1*l.* 4s. 1d., claimed to be due for overtime.

Mr. W. M. Thompson supported the summons, and Mr. Duckworth appeared on behalf of the defendants.

The complainant said he was sent to the City to do certain work at the office of a stockbroker. Owing to the noise a complaint was made, and he had to do the work at night. Prior to commencing he had some conversation with the defendants' foreman as to terms, and said he should expect to be paid in accordance with the rates laid down in the book of rules generally adopted by plumbers. This laid it down that overtime commenced at eight o'clock, and carried time and a half up to eleven o'clock, and double from then until seven in the morning. He had not been paid at these rates. His contention was that he was entitled to overtime rates, even if he did not work at all during the day.

Mr. Duckworth said this was the only point at issue.

Mr. Francis (looking at the book of rules handed up) said he noticed that one of the rules set forth that in the event of there being any dispute between employer and employee arising out of the rules, the matter should be decided by a board of conciliation, whose decision should be final. The whole thing rested on the interpretation of the rules. Provision had been made for disputes being referred to a certain tribunal. Had that course been adopted?

Mr. Thompson said the book of rules had no statutory effect, and did not hold good in a court of law. It had not yet been shown that the com-

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plainant had consented to be bound by the rules produced.

Mr. Francis: But his whole contention is that he is entitled to so much by these rules. I shall adjourn the case *sine die*.

Mr. Thompson: Do I understand that your worship declines jurisdiction?

Mr. Francis: I do. This man founded his case on this book of rules.

Mr. Thompson submitted that the rules had nothing to do with the case. The court took no notice of the tribunal mentioned in the book of rules. His worship was asked to adjudicate in a claim under the Employers and Workmen Act.

Mr. Francis: I may be wrong, but I shall adjourn the case *sine die*. You must take what course you deem proper.

His worship was prepared to state a case for a superior court.—*Morning Advertiser.*

CASE UNDER THE LONDON BUILDING ACT.

AT Westminster Police-court recently, William Rose Pickard, of City-road, E.C., was summoned by the London County Council for contravening Section 63 of the London Building Act, 1894.—Mr. Chilvers, who supported the summons, said the defendant was the builder of St. James's Court, Buckingham-gate—very lofty mansions—and he had permitted them to be occupied without having obtained a certificate from the Central Authority, showing that they were provided with the necessary means of escape for the residents in case of fire. Plans were sent to the Council last August, added Mr. Chilvers, but no alternative means of escape was furnished apart from the usual entrance and exit, and they were not considered satisfactory. In spite of this the buildings were occupied. Mr. Francis imposed fines of 4*l.* and 4*l.* 4s. costs.

SHEFFIELD BUILDING BY-LAWS CASE.

THE Stipendiary (Mr. E. M. E. Welby) gave judgment at the Sheffield Police-court on the 30th ult. in the case in which the Sheffield Corporation charged Thomas Nuttall, of Slinn-street, Walkley, with certain breaches of the building by-laws. The point was whether certain old tramcars which defendant had bought and erected on a piece of land at the corner of South-road and Highton-street, Walkley, were new buildings within the meaning of the by-laws. Four summonses were taken out against the defendant, one of which—charging him with neglecting to give notice to the City Surveyor of intention to erect—was dismissed by the Stipendiary on the first hearing of the case. The other charges had reference to the roof and walls of the "buildings," and defendant's failure to construct them of incombustible material, as provided by the by-laws.

The Stipendiary, in giving judgment, said the puzzle was to know whether two old tramcars had become new buildings, within the meaning of the by-laws; secondly, whether they had become domestic buildings; and if they had, and were not within the exemptions—which they appeared not to be—all their external walls ought to be constructed in accordance with the rules given in By-law No. 17. The complaint made was that the external walls had not been so constructed. As to whether or not the cars had become new buildings there had been several cases decided by the Queen's Bench Division of the High Court, which more or less bore upon the question, and of these Richardson (appellant) against Brown (respondent), decided in February, 1885, and the combined cases of the Mayor of Southend-on-Sea (appellant) against Archer (respondent) and Romani (respondent), seemed most to bear on it. The case of Richardson against Brown appeared nearer to fit the circumstances of the two tramcars, and as the article in question in that case was held to be a new building, he held these two cars to have become new buildings within the meaning of the by-law. If the Southend-on-Sea case had seemed nearer, he should have held that they had not become new buildings, because the articles expressed in that case were held not to be. As to whether the two tramcars had become two new "domestic" buildings, it appeared that one of them was going to be used as a meat shop if all had gone well, but the other car would have been a warehouse for oilcloth and linoleum. He held that neither of them had actually become "domestic" buildings within the meaning of the by-laws. Although he held that there had been an infringement of the other by-law, the offences committed, owing to the great obscurity in the term "new building," were so trifling, that it was inexpedient to inflict more than a nominal punishment, and so the order would be to pay 2s. and costs on each of the two summonses upon which conviction was made.

LANCASHIRE BUILDING DISPUTE.

THE case of Rowson *v.* Harrison came before the Court of Appeal, composed of Lords Justices Vaughan Williams and Stirling, on the 6th inst., on the appeal of the defendant from an order of Mr. Justice Bucknill at the Manchester Assizes on the 24th ult. referring the case for trial before an official referee if the parties could not agree on a special referee.

Mr. Mallinson, in support of the appeal, said that the writ in the action was issued on October 18 last year. The statement of claim was delivered on December 14 last. On January 21 an order was made by consent that the case should be tried by a jury. The plaintiff did not seem to be in a hurry to get the case before a jury, because it was not until the present Manchester Assizes that the case came on for trial. The list at the assizes was a very long one, and there were sixty-two cases for trial. The case came on for trial before Mr. Justice Bucknill and a jury, and in the result his Lordship said he should refer the case, and did so refer it. The defendant now appealed from this order, and said it was eminently a case for a jury to try, and that the learned judge had no jurisdiction to refer the case, and even if he had jurisdiction he had exercised his discretion wrongly. The plaintiff's claim was for damages for alleged obstruction of light and damage to his house in the course of some rebuilding. The claim for light was on a certain agreement, and the plaintiff further said that the defendant, in making alterations to his house, damaged his (the plaintiff's) house. The defence was that the defendant built under a builder and architect nominated by the plaintiff, that the plaintiff had the plans and specifications, and, so far as the light was concerned, the plaintiff consented to everything, and so far as the damage was concerned, the defendant pleaded a denial. The claim for the damage principally rested, not on negligent building, but on trespass in underpinning. The learned counsel contended that it was a proper case to be tried by a judge and a jury, and if the jury had a view of the *locus in quo*, there would be absolutely no difficulty in it. The case could not last a long time.

Mr. Hudson, for the respondent on the appeal, contended that it was a proper case to be tried before an official referee.

At the conclusion of the arguments Lord Justice Vaughan Williams in giving judgment said there was nothing on the face of the proceedings which suggested that the case involved a long inquiry. He thought in the circumstances that it was a proper case for trial before a judge and jury.

Lord Justice Stirling concurred, and the appeal was accordingly allowed, and the order of the learned judge in the court below set aside.

CASE UNDER THE LONDON BUILDING ACT, 1894.

LONDON COUNTY COUNCIL *v.* GARDINER: BAD MORTAR.

AT the Woolwich Police-court, on the 26th ult., before Mr. d'Eyncourt, Frederick Gardiner, 21, Bostall Hill, Plumstead, appeared to answer an adjourned summons by the London County Council for not putting together the brickwork of a building in Grosmount-road with mortar composed in accordance with the Council's by-laws. He was also summoned for neglecting to comply with the notice of the District Surveyor to remedy such irregularity.

The London County Council were represented by Mr. Andrews, while Mr. Tyrrell appeared for the defence.

At the outset it was explained that the case had been adjourned in order that fresh samples from other parts of the building might be taken and analysed.

The District Surveyor, Mr. Thomas Batterbury, submitted diagrams showing the positions from which he took samples.

Cross-examined by Mr. Tyrrell, Mr. Batterbury said nothing appeared to be wrong with the house, and, with the exception of the mortar, the house was properly constructed.

By Mr. d'Eyncourt: The case had been taken up because the mortar in its present state would be affected by the damp and crumble away.

Re-cross-examined: The District Surveyor said he could not say how long the house would last.

Mr. Grimwood, before whom the samples had been placed, produced the result of his analysis, showing the respective proportions of lime and sand in the mortar, and said that the general result of the analysis of the further samples was that they were more or less earthy, and that, in fact, none of the samples were in accordance with the by-laws.

Re-examined: Mr. Grimwood frequently received samples from other districts to analyse. The earthy matter in one of the specimens was 9 per cent., and it should not exceed 1½ per cent.

For the defence, Mr. Stevens, architect and surveyor, of Walthamstow, said he was of opinion that the mortar had set well, was hard, and perfectly good enough for the work. It was quite suitable for speculative building generally.

Mr. d'Eyncourt: In speculative building is the very best mortar used?

Witness: I don't say so.

Mr. d'Eyncourt: Do you say the second best?

Witness: I won't say that.

Mr. d'Eyncourt: Or the third best?

Witness: Nor the third best. He knew of a building at Clapham Junction built with similar mortar which, to his knowledge, had lasted twenty-three years, and was still in good condition.

Mr. d'Eyncourt said the question he had to consider was the condition of the mortar. He was loth to make an order to demolish the building until he was thoroughly satisfied that the building was bad throughout. There had been brought before them the definition of speculative building of such a type that the London County Council was anxious to forbid. He convicted the defendant on the summons under the by-laws in respect of the improper mortar, and fined him 1*l.* and ordered 2*l.* 2s. for costs. On the summons for failing to comply with the notice of irregularity, he made an order on the defendant within fourteen days to take down the brickwork put together with the improper mortar, and ordered the defendant to pay 5*l.* 5s. for costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

6,403.—A SPARK-ARRESTER: *A. J. Wilton.*—A wider conical cap is put upon the top of the chimney-pipe, and around it is placed a hopper (having a flange turned inwards at its rim) fitted with spiral vanes and joined with tubes to a discharging-pipe.

6,414.—DOOR-BOLTS: *F. J. Cope.*—A pin passed through a semi-circular slot joins the bolt-tail to the knob which may be turned for readily working the bolt, but cannot be forced backwards; the pin may be provided with a roller, and, in another shape, the bolt is connected with a lever upon the spindle of the knob.

6,455.—ROOFING AND OTHER SLABS: *L. Hatschek.*—The slabs are composed of an artificial stone which consists of a mixture of asbestos, or some other fibrous substance, hydraulic lime, and cement, of which thin plates are formed in a cardboard-making machine, the plates being then subjected to a high pressure for their shapes and surfaces.

6,458.—A SPANNER: *A. R. Upward.*—A plate that can be turned and fixed to the handle has several jaws or openings cut around it, its squared stem will fit between jaws upon the handle, and a pin inserted through a flange upon the stem and into the handle locks the plate, or the plate may be locked by means of a bolt.

6,464.—A COMBINED CHIMNEY COWL AND VENTILATOR: *R. M. Pancaost.*—A set of outer plates is hung from a top cover so as to cover openings into a space above the neck of the cowl; overlapping inner plates are arranged between the vertical edges of the outer plates, and in some cases the several plates are flared or curved; the contrivance is available for a continuous series of skylight ventilators affixed to a roof.

6,497.—A FITTING FOR LAVATORY BASINS: *G. Smith.*—The inventor's object is to furnish means of obtaining a supply of water when the main pipe is not available for that purpose. He provides an auxiliary tank at the back, with a tap that projects over the basin.

6,524.—A WALL-TIE: *J. D. Johnston.*—The wall-tie or plate is fashioned of open-work sheet-metal, in a double V-shape on plan, with ears at the sides, middle webs, and pierced lugs or ears at the ends, which are to be nailed in position or turned up at a right angle so as to enter joints in the brickwork.

6,536.—A CHIMNEY POT: *J. Marchant.*—Vertical wind-passages are fashioned in the chimney-pot, which communicate upwards with inlet openings, and have fans fitted upon their bell-mouths. The spindles of the fans carry vanes outside the passages.

6,570.—A JOINT OR STOP FOR TUBES: *C. W. Schou.*—The joint is devised for tubes and tube terminals, and also for stopping tube ends. A collar of soft metal or alloy, to be cut into and displaced as the joint is being screwed up, is fitted either upon an interior screwed liner or ferrule, or upon the screw which is threaded in the tube bore, the liner being screwed internally. The joint is specified as being adapted for tee-pieces, for screw plugs, and for closing sockets.

6,595.—THATCHING OF ROOFS: *R. W. Spurway.*—After the straw has been pressed between perforated plates (which are disposed parallel-wise) with an end-rammer, it is made secure with wire pins between galvanised wires or waterproofed strings, to the ends of which rings are firstly fastened, the pins being inserted through the holes in the pressing-plates. For providing a continuous length of straw matting, the wires or strings are unwound from rollers. The ends of the pressing-plates have guide-notches that take the wires.

6,620.—CALLIPER GAUGES: *E. Capitaine.*—The two legs are made in two parts, so that a sliding gauge may be approximately set to the measurement required. When the parts have been clamped together, the calliper points are finely adjusted with a screw that operates upon the vernier arm against the pressure of a spring. In the case of large work, the two legs may be pivoted on to clamps upon a cross-bar, and the ends of one leg and the vernier arm are joined in the same manner, whilst a nut and a right-and-left-handed screw serve to shorten and lengthen the cross-bar.

6,625.—MANUFACTURE OF GAS: *G. Ottermann & Co. and V. Loos.*—A fire-clay retort, which has a stirring-blade, and is heated to from 700 deg. to 800 deg. C., is charged with waste products, refuse sweepings, &c. The resultant gases are conveyed into a second fire-clay retort similarly heated, and

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being dissociated as they pass over red-hot paper ashes, or some other neutral material, and over heated coke, are passed through a container which is charged with a red-hot admixture of carbon and alkali carbonates, or an admixture of potash, carbon, and ground iron or iron oxides, so that the nitrogen becomes retained as cyanogen compounds. The combustible gases are then conveyed (out of the second retort) to a hydraulic main, and so to condenser. It is stated that they are practically free from carbonic oxide.

6,706.—A METHOD OF HEATING BUILDINGS: *A. G. Paul.*—The invention, which is more particularly applicable for the system of heating specified in No. 21,423 of 1891, furnishes thermostatical means for automatically regulating the supply of the heating fluid and for working a valve in the air-exhaust pipe or in an air-flue; it embodies various modified forms, by one of which a thermometer, clipped on to one of the radiator pipes, provides for the closing of the supply pipe when the electrical circuit is effected and an armature is attracted by a coil in opposition to a spring. In another form it is arranged that the thermometer shall, by means of an electro-magnet, regulate a valve in the air-pipe, an exhauster, in the shape of a jet of steam or water being affixed to the end of the pipe; or an electro-magnet which attracts an armature is set to operate a damper that will admit cold air to cool the radiator as soon as a certain temperature has been attained and electrical current has been made.

6,737.—FENCES AND FENCING: *N. B. Riddle.*—The post has its lower portion made of glass in concavo-convex shape and its upper portion of wood, the two parts being fastened together with bolts, and cushions are inserted between them, and springs between the bolt-nuts and the lower part of the post; the cushions are intended to prevent the upper part from becoming decayed, as they allow air to circulate around, and the springs will minimise the effects of shocks upon the glass arising from strain upon the wire runners.

6,739.—A METHOD OF BALANCING WINDOWS: *W. Schuch and G. Wolf.*—A groove in each sash-stile carries a screw having a rapid pitch between dove-tailed bearing plates and working in a U-shaped threaded sleeve. A screwed plug secures one end of the upper pivoted plate to the screw, whilst to the other end is secured a coiled spring. To the top and bottom rails of the sash are fixed recessed plates in which the bearing or pivot plates will slide. Lubricating oil runs from a cup upon the upper pivot down inside a hollow screw, and so through the pierced plug and lower pivot; in a variant shape screws are rotated by threaded sleeves or nuts which are secured to the sashes so as to wind up the springs as the sashes are being lowered. The lower end of the screw is joined with a screwed coupling-rod to the spring-rod carried by a conical bearing block. Its upper end is mounted upon a fixed slotted bearing plate, and to an adjustable sleeve, of which the ratchet teeth will engage with the teeth of the bearing block is secured the lower end of the spring.

6,745.—A CHART FOR PLOTTING REGULAR FIGURES.—*I. M. B. Thompson.*—The inventor has devised a mathematical chart wherewith regular figures and patterns may be plotted; from a common centre he describes a series of equidistant circles, and for setting out the angle-points of regular polygons he draws radial lines inclined from a common starting-point at the angles desired; the lines end upon different circles; those, for instance, for the pentagon, decagon, and so on upon the first circle, those for the square, octagon, and so on upon the second circle, and they are numbered at their outer ends 20, 5, 20, 10, 20, 5, ... , 4, 32, 16, 32, 8, 32, 4 . . . . . The circles are marked with the numbers of the sides of the polygons to which they severally appertain, and with the letters *a*, *b*, *c*, ... *s*; the space outside the remotest circle is divided into squares with their diagonals marked; the sides of the squares are equal to the distances between the pairs of adjacent circles; tangents to the circles, lines at right angles intersecting at given points, and other lines may be drawn by means of the squares and their diagonals, and measuring scales are marked around the entire diagram.

6,793.—AUTOMATICAL SWITCHING APPARATUS (ELECTRICAL): *F. J. Tolchard.*—The voltmeter will close the one or the other of two relay circuits when the current varies from the limits determined; motors that will work a switch for cutting in or out battery cells are connected with the relays; a series of switch arms which carry contacts that dip into mercury cups is engaged by a series of discs having recesses set in a helical curve and mounted upon a shaft; rollers of the arms repose upon the discs, so that one switch only can be "on" at one time; the contacts, which are connected through a resistance, are shaped so that the main circuit cannot be completely broken, nor a cell be short-circuited; the motors at either end of the switchboard have, apiece, an electro-magnet with an armature that will turn a shaft; on the armature shaft is a rod which, as it engages the ends of a horn, will break the motor-circuit when the movement of the armature is completed and one cell has been cut in or out.

6,819.—AN INSTRUMENT FOR SURVEYORS' USE: *M. Baumer.*—The instrument is adapted for measuring distances and horizontal or vertical angles, or the co-ordinates of distant points, and for plotting them on paper. A disc fitted with a vernier moving over a scale upon another disc affixed to the column is approximately adjusted with an arm fitted with a set-screw, for the finer adjustment a tangent screw is set in engagement with a pin that projects from a bracket upon the former disc, to which are fastened the bearings of the horizontal axis and a bracket; the bracket carries a worm which works a sector upon the axis and is fitted with a scale and a vernier. A foot to which the distance meter is secured is clamped by V-grooves cut in a plate mounted on arms upon the shaft, and its two telescopes are set at a fixed distance the one from the other. The horizontal vernier having been adjusted at zero the fixed telescope is fixed upon the distant object, and as the other telescope is then directed on to the object its distance may be ascertained from the vernier reading; the height of the object and its horizontal distance are then read by the adjustment of a vertical rod that slides upon a horizontal scale attached to the disc with a scale upon the shaft, a pencil-point upon a slide at the bottom of the vertical rod plots upon a drawing-board each point as it is surveyed.

MEETINGS.

WEDNESDAY, AUGUST 14.

Institute of Sanitary Engineers.—Examination and Literary Committee at 3.0 p.m. General Purposes and Finance Committee at 4.0 p.m. Council Meeting at 7.0 p.m.

AUGUST 12 TO 17.

Institution of Junior Engineers.—Summer Meeting, Plymouth and Devonport. Visits to H.M. Dockyard, Devonport; H.M.S. *Cambridge* (gunnery ship) and H.M.S. *Defiance* (torpedo school ship); Keyham Dockyard Extension Works; Keyham Steam Yard and Royal Naval Engineering College; Royal William Victualling Yard; Saltash Tubular Bridge; and other works and places of engineering interest in the neighbourhood. The Summer Dinner of the Institution takes place at the Hotel Continental, Plymouth, on Friday, August 16.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 16.—By ED. PARTRIDGE (at Bideford).

Shebbear, Devon.—Caute and Trickey's Farm, 85 a. 0 r. 22 p., f. £1,650

By WINCH & SONS (at Ashford).

Biddenden, Kent.—River Hall Estate, 129 a. 0 r. 24 p., f. 2,430

Bethersden, Kent.—Bridge Farm, 64 a. 3 r. 18 p., f. 850

Jack Watts' Field, 18 a. 1 r. 28 p., f. 250

Enclosures of land, 27 a. 2 r. 1 p., f. 410

The Bull Green Land, 26 a. 3 r. 17 p., f. 740

Toll Gate House, 0 a. 1 r. 5 p., f. 165

Freehold house and four cottages 505

July 23.—By ALFRED RICHARDS (at Tottenham).

Tottenham.—Lordship-rd., a block of building land, with stabling thereon, f. 565

July 25.—By WALTON & LEE (at Whitby).

Lealholm, Yorks.—Lealholm Bridge Farm, 211 a. 1 r. 35 p., f. 4,150

By WINCH & SONS (at Maidstone).

Headcorn, Kent.—Brookwood Farm, 141 a. 3 r. 8 p., f 3,000

Frittenden, Kent.—Little Hungerden or Hungerdown Farm, 39 a. 0 r. 37 p., f. 1,000

Staplehurst, Kent.—Bower Fields, 10 a. 2 r., 26 p., f. 550

By COOPER & PREECE (at Ross).

Sellack, &c., Hereford.—Baysham Court Estate, 245 a. 2 r. 6 p., f. 9,700

Two Acres at the Marsh, 2 a. 2 r. 23 p., f. 105

By DAVID PRICE (at Hay).

Brilley, Hereford.—Kintley Farm, 231 a. 1 r. 6 p., f. 6,500

July 26.—By S. & G. KINGSTON (at Long Sutton).

Long Sutton, Lincs.—Freehold messuage and 2 a. 3 r. 7 p. 355

Various enclosures of land, 24 a. 1 r. 29 p., f. .. 1,008

Enclosures of land, 11 a. 0 r. 9 p., f. 700

Six cottages and several gardens, 2 a. 0 r. 9 p., f. 323

Little Sutton, Lincs.—Two enclosures, 10 a. 2 r. 0 p., f. 530

Freehold messuage and 24 a. 2 r. 5 p. 1,490

By VERNON & SON (at High Wycombe).

Chepping Wycombe, Bucks.—Three enclosures, 24 a. 1 r. 36 p., f. 600

Holmer Green, Bucks.—A cottage and 3 a. 0 r. 31 p., f. 360

Polydores and 2a. 2 r. 36 p., f. 430

Two cottages and 3 a. 2 r. 16 p., f. 410

Piece of woodland, &c., 11 a. 3 r. 11 p., f. 290

Little Missenden, Bucks.—Piece of meadow land, 2 a. 0 r. 33 p., f. 145

Freehold cottages and 7 a. 1 r. 20 p. 260

Enclosures of land, 18 a. 2 r. 11 p., f. 730

Hyde Heath Farm, 70 a. 2 r. 25 p., f. 2,675

Hedgerley, Bucks.—A freehold residence and 4 a. 3 r. 20 p. 676

Woburn Common, Bucks.—Enclosure of land, 10 a. 2 r. 2 p., f. 440

By DOLMAN & PEARCE.

Hampstead.—6 and 8, Pond-st., f., r. 95*l.* 2,155

Stoke Newington.—64, Mildmay-pk., f. 1,110

Holloway.—68, Cottenham-rd., u.t. 62 yrs., g.r. 6*l.* 6s., r. 36*l.* 305

By KNIGHT, FRANK, & RUTLEY.

Soho.—11, Dean-st., f., r. 115*l.* 2,800

Putney.—27 and 29, High-st., f., r. 180*l.* 4,000

Brixton.—42, Lorn-rd., u.t. 33 yrs., g.r. 2*l.*, r. 45*l.* 400

105, Holland-rd. and 181, Loughborough-rd., u.t. 93 yrs., g.r. 20*l.*, r. 170*l.* 800

184, Brixton Hill, also Guyatts Yard and l.g.r. 15*l.*, u.t. 13 yrs., g.r. 51*l.*, r. 108*l.* 690

By HARDS & BRADLY.

Greenwich.—44 and 46, Haddo-st., u.t. 96 yrs., g.r. 8*l.* £400

Charlton, Kent.—108, Charlton-lane, u.t. 85 yrs., g.r. 4*l.* 12s. 285

Greenwich Market Tolls.—The tolls, rents, and stallages, together with No. 1, Weighing-room, let at per annum 200

By OGDEN, SONS, & OLLEY.

Wimbledon.—44, 46, and 50, Russell-rd., f. 1,100

By RIDER & SONS.

Notting Hill.—243 to 261 (odd) and 251A and 251B, Latimer-rd., u.t. 42 yrs., g.r. 142*l.*, r. 416*l.* .. 1,090

1 to 5, Wood-st., u.t. 63½ yrs., g.r. nil 1,260

13 and 15, Bangor-st., u.t. 65 yrs., g.r. 7*l.* 520

14 and 16, Bangor-st., u.t. 64 yrs., g.r. 10*l.* 15s. 600

108, 110, and 112, Walmer-rd., u.t. 41 yrs., g.r. 21*l.* 800

Kensal Rise.—10, Earlsmead-rd., u.t. 82 yrs, g.r. 5*l.* 245

By VICTOR VAUGHAN.

Finchley.—36, Hertford-rd., f., r. 36*l.* 600

July 27.—By S. & G. KINGSTON (at Wisbech).

Sutton St. Edmonds, Lincs.—Inkerson Fen Farm, 77 a. 3 r. 37 p., f. 2,100

By MORRIS, SONS, & PEARD (at Taunton).

Trull, &c., Somerset.—Batts Park Estate, 37 a. 0 r. 15 p., f. 4,925

Haygrove and Batts Farm, 159 a. 3 r. 14 p., f... 6,875

Wilton, &c., Somerset.—Cutliffe and Cotlake Farm, 185 a. 2 r. 37 p., f. 6,900

Trull, Somerset.—Comeytrowe Farm, 115 a. 1 r., f. 4,675

Pitminster, Somerset.—Howleigh Farm, 178 a. 3 r. 30 p., f. 5,300

Lower Blagdon Farm, 9 acres, f. 700

Angersleigh, &c., Somerset.—Leigh and Wrexon Farm, 269 a. 0 r. 25 p., f. 4,050

Corfe, Somerset.—Whitford Quarry, and 16 a. 3 r. 39 p., f. 300

Kittisford, Somerset.—Kittisford Barton Estate, 267 a. 2 r. 10 p., f. 5,000

New House Farm, 151 a. 3 r. 37 p., f. 3,525

Winsford, Somerset.—High and Lower Tor Farm, 196 a. 0 r. 32 p., f. 1,460

July 29.—By BAXTER, PAYNE, & LEPPER.

Bickley, Kent.—Park Riding, and 1 a., f. 3,300

Beckenham, Kent.—1, 2, and 3, St. Margaret's-rd., u.t. 98¼ yrs., g.r. 10*l.* 17s. 6d. 760

By ELLIOTT, SON, & BOYTON.

Kensington.—68, Holland-pk., f. 4,450

By FURBER, PRICE, & FURBER.

Chancery-lane.—15, Took's-court, area 1,200 ft., f. 1,620

By FOSTER & CRANFIELD.

Ealing.—2, Oxford-rd., u.t. 61½ yrs., g.r. 7*l.*, r. 34*l.* 220

Marylebone.—100, Crawford-st., u.t. 51 yrs., g.r. 12*l.*, r. 85*l.* 225

By MOORE & TEMPLE.

Hackney.—1, 3, 5, and 7, Chatham-pl., u.t. 38 yrs., g.r. 21*l.* 10s., r. 127*l.* 950

72, Paragon-rd., u.t. 38 yrs., g.r. 4*l.*, r. 34*l.* 290

115 and 117, Eleanor-rd., u.t. 56½ yrs., g.r. 10*l.*, r. 66*l.* 660

By W. R. NICHOLAS & Co.

Orpington, Kent.—Glentworth and nearly 3 a., f. 3,000

By REYNOLDS & EASON.

Poplar.—High-st., The Queen's Palace of Varieties, f.g.r. 45*l.*, reversion in 12 yrs. 3,600

Whitechapel.—54, Mansell-st., f., r. 55*l.* 1,700

Hoxton.—Hyde-rd., &c., i.g.r.'s 153*l.* 16s., u.t. 15½ yrs., g.r. 51*l.* 16s. 770

Hyde-rd., &c., i.g.r. 45*l.* 10s., u.t. 17½ yrs., g.r. 17*l.* 10s. 800

Whitmore-rd., &c., i.g.r.'s 210*l.* 4s., u.t. 15½ yrs., g.r. 136*l.* 4s. 1,070

Finsbury.—4, 6, 10, 12, 14, and 16, Clifton-st., u.t. 7½ yrs., g.r. 47*l.*, r. 184*l.* 16s. 325

Old Kent-rd.—No. 390 to 398 (even); also 1 and 2, Ormond-passage; and 1, 2, and 3, Glengall-cottages, u.t. 26 yrs., g.r. 17*l.* 15s. 1,750

Kingsland.—20, Mansfield-st., u.t. 18 yrs., g.r. nil, r. 26*l.* 175

July 30.—By H. J. BROMLEY.

Norwood.—143 and 145, High-st., u.t. 22½ yrs., g.r. 16*l.* 250

Catford.—66 and 68, Bradgate-rd., f., r. 48*l.* 665

Brockley.—79, Foxberry-rd., u.t. 73 yrs., g.r. nil., r. 52*l.* 800

By DEBENHAM, TEWSON, & Co.

Godalming, Surrey.—Ockford-rd., Ockford House and 2 a., f. 2,750

By DENNANT & Co.

Wilmington, Kent.—Wilmington Hall and 48 a. 3 r. 12 p., f. 5,140

By MULLETT, BOOKER, & Co.

Hyde Park.—Southwick-cres., i.g.r. 20*l.*, u.t. 33½ yrs., g.r. 2*l.* 295

Southwick-pl., i.g.r. 20*l.*, u.t. 33½ yrs., g.r. 2*l.* 10s. 285

By RAMSEY & Co.

Peckham.—2, Lanvanor-rd., u.t. 75½ yrs., g.r. 5*l.* 320

By WALTER SIMONDS.

Clapham.—54, Fentiman-rd., u.t. 24 yrs., g.r. 6*l.* 10s., e.r. 48*l.* 310

By FRED. VARLEY.

Finsbury Park.—5, Adolphus-rd., u.t. 73 yrs., g.r. 9*l.* 13s., e.r. 65*l.* 485

16, Princess-rd., u.t. 63 yrs., g.r. 12*l.* 12s., e.r. 65*l.* 625

Stoke Newington.—42, Milton-rd., f., r. 26*l.* 405

Dalston.—79, Forest-rd., u.t. 13½ yrs., g.r. 3*l.* 10s., r. 30*l.* 215

By FRED. WARMAN.

Gray's Inn-rd.—7, Calthorpe-st., u.t. 18 yrs., g.r. 9*l.* 10s., r. 60*l.* 420

Islington.—39 to 44, Wilton-sq., u.t. 23½ yrs., g.r. 25*l.* 4s., r. 192*l.* 1,300

Holloway.—31, Upper Tollington-rd., u.t. 41½ yrs., g.r. 6*l.* 10s., e.r. 42*l.* 310

Crouch End.—29, Crescent-rd., u.t. 67 yrs., g.r. 10*l.* 600

Hornsey.—Grove House-rd., a range of stabling, f., e.r. 28*l.* 245

By HAMPTON & SONS.

Wimbledon.—Pepys-rd., a freehold cottage 550

Cottenham Park-rd., f.g.r.'s 117*l.*, reversion in 57½ yrs. 2,930

The Drive, f.g.r.'s 127*l.*, reversions in 76, 77, and 84 yrs. 3,160

Arterberry-rd., f.g.r.'s 131*l.*, reversions from 77 to 83 yrs. 3,215

Arterberry-rd., a freehold site, r. 50*l.* 1,230

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Wimbledon.—Worple-rd., f.g.r.'s 35*l.* reversions in 63, 88, and 98 yrs. £910
Pepys-rd. (near), two freehold plots 200
New Southgate.—Bowes-rd., Devanha House, f. 2,390
Fleet, Hants.—Peatmoor and 4 a., f. 3,500
Reigate, Surrey.—Greenhayes and 3 a., f. 2,500
By J. C. PLATT (at Hammersmith).
Hammersmith.—Ravenscourt-sq., Ravenstower, u.t. 36½ yrs., g.r. 8*l.*, e.r. 65*l.* 650
Kensington.—15, Colet-gardens, u.t. 90 yrs., g.r. 7*l.* 10s., e.r. 48*l.* 590
By M. C. INNOCENT (at Lechlade).
Bradwell, Oxon.—Peacock Farm, 68 a. 3 r. 14 p., f., subject to payment of 11s. per week to life aged 43.. 1,200
By D. LEGGE, SON, & PEARCE (at Dursley.)
Cam., Glos.—Ashmead Estate, 72 a. 3 r. 32 p., f. 5,600
Lower Leaze Close, 11 a. 0 r. 9 p., f. 830
Coaley, Glos.—Field Farm, 114 a. 1 r. 28 p., f. .. 4,950
Stinchcombe, Glos.—Melksham Court Farm, 144 a. 1 r. 37 p., f. 3,800
Bownance Wood, 10 a. 1 r. 33 p., f. 510
Various closes of land, 57 a. 3 r. 37 p., f. 2,510
Newnham Quarry Farm, 19 a. 1 r. 35 p., f. 810
Cam, Glosr.—The Old Quarry, 1 a. 2 r. 18 p., f. .. 325
July 31.—By ARTHUR BLACKFORD.
Wandsworth.—23, 25, and 27, Frogmore, f. 675
38 to 43, Wharf-rd., f. 1,015
By BROAD, WILTSHIRE, & PENNY.
Southwark.—1, 2, and 3, Little Suffolk-st., u.t. 20½ yrs., g.r. 18*l.* 350
By BUNCH & DUKE.
Hackney.—33, Casterton-st., u.t. 76 yrs., g.r. 6*l.* 260
By COOPER & GOULDING.
Barnsbury.—Hemingford-rd., i.g.r.'s. 40*l.*, u.t. 41 yrs., g.r. 4*l.* 615
Clapton.—Jeffreys-rd., &c., i.g.r.'s 89*l.*, u.t. 59 yrs., g.r. 25*l.* 1,090
Forest Hill.—Wynell-rd., i.g.r. 15*l.*, u.t. 62 yrs., g.r. 2*l.* 240
Kennington.—Kennington-grove, Prince of Wales Tavern, i.g.r. 30*l.*, u.t. 23¼ yrs., g.r. 14*l.* 10s.. 175
By GIDDY & GIDDY.
Whitton, Middx.—Hounslow-rd., Argyle Lodge and 3½ a., f. 2,000
By FRANK JOLLY & Co.
Finsbury.—21, Cross-st., u.t. 16½ yrs., g.r. 58*l.*, r. 388*l.* 3s. 2,260
By NEWBON, EDWARDS, & SHEPHARD.
Highgate.—49, Cromwell-av., f., e.r. 75*l.* 1,050
Stoke Newington.—14, St. Kilda's-rd., u.t. 73½ yrs., g.r. 7*l.*, r. 38*l.* 445
Crouch End.—4, Aubrey-rd., u.t. 86½ yrs., g.r. 9*l.*, e.r. 50*l.* 485
Highbury.—59, Leigh-rd., u.t. 58 yrs, g.r. 10*l.*, e.r. 65*l.* 550
Islington.—6 and 8, Arlington-st., u.t. 26 yrs., g.r. 8*l.* 8s., r. 62*l.* 520
Dalston.—111, Pownall-rd., u.t. 42 yrs., g.r. 4*l.*, r. 26*l.* 300
Penge.—23, Woodbine-gr., f., r. 22*l.* 305
By RUSHWORTH & STEVENS.
Bayswater.—26, Northumberland-pl., u.t. 44½ yrs., g.r. 6*l.* 6s., r. 43*l.* 370
By WEATHERALL & GREEN.
Fleet-st.—Nos. 86, 87, and 88, corner building site, area 1,050 ft., f. 15,500
Leicester-sq.—10, Leicester-pl., and 40A, Lisle-st., beneficial lease for 20 yrs., r. 200*l.* until 1911 and 225*l.* thereafter 600
Wimbledon.—1, 3, and 5, Hartfield-rd., f., r. 190*l.* 4,100
Tilbury, Essex.—Broadway, a corner building plot, f. 1,270
By WESTON & SONS.
Kennington.—86 and 88, St. Mark's-rd., f. 310
151, Warham-st., f. 210
136, Farmers-rd., f. 600
Peckham.—52, Hill-st., f., r. 39*l.* 445
By STIMSON & SONS. 200
Enfield.—Browning-rd., a freehold building estate, 3 a. 410
Kensington.—12, Campden Hill-sq., u.t. 35 yrs., g.r. 7*l.*, r. 130*l.* 1,230
Deptford.—Adolphus-st., The Lord Stanley b.-h., f., r. 60*l.* 650
69, Adolphus-st., f., r. 25*l.* 1,270
3, Mitchell-cottages, f., r. 20*l.* 310
Brixton.—41, Beechdale-rd., u.t. 89 yrs., g.r. 10*l.*, r. 50*l.* 210
August 1.—By ORGILL, MARKS, & LAWRENCE. 600
Haymarket.—Coventry-st., The Globe Restaurant, also, 5, Rupert-st., f. 580
5, Coventry-st., beneficial lease for 76½ yrs., r. 325*l.* 40,000
6 and 6A., Coventry-st., and 1, Rupert-st., a profit rental of 385*l.* for 10 yrs. 2,500
By FISHER, STANHOPE, & DRAKE.
Stoke Newington.—46, St. Kilda's-rd., u.t. 78 yrs., g.r. 10*l.* 10s., e.r. 60*l.* 1,000
1, Foulden-rd., u.t. 71 yrs., g.r. 7*l.*, e.r. 55*l.* 700
By GLASIER & SONS. 500
Pimlico.—54, Belgrave-rd., u.t. 28 yrs., g.r. 14*l.*, r. 130*l.* 1,100
Belgravia.—1, Halkin-st., u.t. 2¾ yrs., g.r. 5*l.*, r. 240*l.* 450
Barnsbury.—Hemingford-rd., i.g.r.'s 56*l.*, u.t. 41 yrs., g.r. 8*l.* 830
By STIMSON & SONS.
Peckham.—331, 233, 235, 257, 241, and 243, Hollydale-rd., u.t. 71 yrs., g.r. 25*l.* 13s. 4d., r. 200*l.* 1,510
112 and 114, Camden-grove, u.t. 63 yrs., g.r. 8*l.*, r. 54*l.* 460
Battersea.—11 and 12, Lubeck-st., u.t. 56 yrs., g.r. 8*l.*, r. 54*l.* 370
11, Shillington-st., u.t. 68 yrs., g.r. 4*l.* 10s., r. 26*l.* 150
22 to 28 (even), Wayford-st., u.t. 74 yrs., g.r. 20*l.*, r. 155*l.* 835
63 and 65, Wayford-st., u.t. 56 yrs., g.r. 9*l.* 6s. 8d., r. 67*l.* 425
Wandsworth.—35 to 43 (odd), Garton-st., u.t. 52 yrs., g.r. 15*l.* 15s. 310
44 and 46, Wardley-st., u.t. 79 yrs., g.r. 6*l.* 6s. . 135
Battersea.—2 to 14 (even), Carpenter-st., u.t. 70 yrs., g.r. 29*l.* 10s. 1,010
39, Rowena-cresc., u.t. 76 yrs., g.r. 5*l.* 230
Tooting.—25 and 27, Albert-ter., u.t. 76 yrs., gr. 6*l.* 310
Mitcham.—39 to 55 (odd), Fountain-rd., u.t. 79 yrs., g.r. 24*l.* 15s. 460
Sutton.—12 to 18, 42 to 72 (even), 23 to 29 (odd), Beulah-rd., u.t. 77 yrs., g.r. 87*l.* £2,290
Croydon.—80, 82, and 84, Southbridge-rd., u.t. 79 yrs., g.r. 18*l.* 600
Beckenham.—95 and 97, Mackenzie-rd., u.t. 83 yrs., g.r. 9*l.* 430
Molesey.—Kent-rd., Chester Lodge, u.t. 66 yrs., g.r. 12*l.* 10s., r. 60*l.* 400
Bethnal Green.—1, 2, and 3, Peacock-pl., and 1 to 15, Peacock-st., u.t. 76 yrs., g.r. 77*l.* 1,590
Silvertown.—2 to 52 (even), Emma-st., u.t. 76 yrs., g.r. 104*l.* 2,045
Victoria Docks.—1 to 9 (odd), Stanley-st., u.t. 66 yrs., g.r. 20*l.* 410
West Ham.—88 and 90, Meeson-rd., u.t. 78 yrs., g.r. 10*l.* 340
Stamford Hill.—1 to 15 (odd), Netherton-rd., u.t. 75 yrs., g.r. 32*l.* 980

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1 11 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 6	,,	at railway depôt.
Red Wire Cuts	1 14 6	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 4 6	,,	,, ,,
Do., Bullnose	4 9 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 2 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
plays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	34 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt
Bath ,,	1 7	,, ,,
Farleigh Down Bath	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,,	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks	2 1½	,, ,,
Red Corsehill ,,	2 5	,, ,,
Red Mansfield ,,	2 4½	,, ,,
Hard York in blocks	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt
,, ,, 6 in. Rubbed Ditto	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3-in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor	11 5 0	per 1000 of 1500 at ry. dep	
,, best seconds ,,	10 15 0	,,	,,
16× 8 best ,,	6 2 6	,,	,,
20×10 best blue Portmadoc	18 0	,,	,,
16× 8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green	11 2 6	,,	,,
16× 8 ,, ,,	6 15 0	,,	,,
20×10 Permanent green	10 0 0	,,	,,
16× 8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt.	
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	more than battens.
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard. £ s. d.	£ s. d.
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	19 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	19 0 0	20 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 0 0	16 0 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 10 0	15 10 0
Second yellow deals, 3 in. by 11 in.	16 10 0	17 10 0
Do. 3 in. by 9 in.	15 0 0	16 0 0
Battens	12 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	11 10 0	12 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	8 0 0
Compound Girders ,, ,,	9 0 0	10 5 0
Angles, Tees and Channels, ordinary sections	8 17 6	10 17 6
Flitch Plates	9 0 0	9 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

[See also page 147.

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COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Alteration to Ecclesall Church	Sheffield		Aug. 31
Laying out grounds for Western Parade	Penzance		Sept. 1
Laying out land to be added to Cemetery	Blackpool	30*l.*, 15*l.* and 5*l.*	Sept. 16
Public Baths	Chelsea		Oct. 1
Public Baths and Washhouses	Camberwell	150*l.*, 75*l.* and 50*l.*	Oct. 29
Chapel, not to exceed 5,000*l.*	Cardiff		No date
Municipal Buildings, Fire Station, Surveyor's Residence	Walton-on-Thames		do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Additions to School and House, Maindy	Llandaff School Board	G. E. Halliday, Architect, 14, High-street, Cardiff	Aug. 13
Cottages at the Asylum, Burghill	Hereford Asylum Committee	A. Dryland, Surveyor, Shire Hall, Hereford	do.
Additions to Station, Great Marlow	Great Western Railway Company	G. K. Mills, Paddington Station, W.	do.
Six Houses, Westhoughton, Lancs.	United Industrial Society, Ltd.	A. E. Suddell, Architect, Church-street, Westhoughton	do.
Laying Cast-iron Pipes (3 miles)	Newport (Mon.) Corporation	E. T. Hildred, Civil Engineer, Town Hall, Newport	do.
Road Works, Reddish-road Tramway	Stockport Corporation	J. Atkinson, Civil Engineer, Town Hall, Stockport	do.
Houses, Wortley Cemetery, Leeds	New Wortley Burial Board	J. W. Lawton, Architect, 86, Albion-street, Leeds	do.
Cemetery Building Works	Romsey Burial Committee	J. Jenvey, Architect, Romsey	do.
Rebuilding Bridge over the Thames		J. Morris & Son, Architects, 156, Friar-street, Reading	do.
Police Station, Walkden, near Bolton	Standing Joint Committee	H. Littler, Architect, County Offices, Preston	Aug. 14
Bridge, Crossdale, Ennerdale	Whitehaven R.D.C.	G. Boyd, Civil Engineer, 33, Queen-street, Whitehaven	do.
Water Supply, St. Stephen's-by-Saltash	St. Germans R.D.C.	F. W. Cleverton, 4, Buckland-terrace, Plymouth	do.
Church Works, Lisbellaw, Ireland		Mr. Downey, Fermanagh Library, Lisbellaw	do.
Road Works, Northfields Estate	Stamford Town Council	J. Richardson, Surveyor, 15, Barn-hill, Stamford	do.
Widening Mitre Bridge	Burnley Corporation	Borough Surveyor, Town Hall, Burnley	do.
Sewers, Lias-street, &c.	Kettering U.D.C.	T. R. Smith, Surveyor, Market Place, Kettering	do.
Pair Cottages, Hall Farm, Purleigh		F. Whitmore, Architect, 17, Duke-street, Chelmsford	Aug. 15
Offices and Stores, Redruth	S. & T. Trounson	S. Hill, Architect, Green-lane, Redruth	do.
Additions to Highfield House, near Huddersfield		J. Kirk & Sons, Architects, Huddersfield	do.
Stabling, &c., Outlane, near Huddersfield		J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Shop and House, Fore-street, Redruth	Miss Earle	S. Hill, Architect, Green-lane, Redruth	do.
Offices and Stores, Redruth	Messrs. S. & T. Trounson	do.	do.
Road, The Decoy	Eastbourne Town Council	R. M. Gloyne, Civil Engineer, Town Hall, Eastbourne	do.
Farmhouse, Aish, South Brent		W. T. Pearse, Surveyor, Modbury, Devon	do.
Additions to Methodist Church, Whitehaven		A. Huddart, Architect, 22, Lowther-street, Whitehaven	do.
Rebuilding Bridge, Worleston, near Nantwich		H. F. Bull, The Castle, Chester	do.
Farm Buildings, &c., Chittlehamholt, N. Devon	Mr. W. R. Moore	S. Dobell, Architect, Queen-street Chambers, Exeter	Aug. 16
Additions to Gortuakelly House, near Enniskillen		T. Elliott, 37, Darling-street, Enniskillen	do.
Additions to School, Spittal		W. Gray, Architect, 2, Ivy-place, Berwick-on-Tweed	do.
Residence, Stable, &c., Ingleton, near Kendal		S. Shaw, Architect, Highgate, Kendal	do.
Five Houses, Hogg's Folly, Londonderry	Rev. Dr. O'Doherty	E. J. Toye, Architect, Strand, Londonderry	do.
Wrot-iron Fencing with Gates, &c.	Met. Borough of Hackney	Borough Engineer, Town Hall, Hackney, N.E.	do.
Stables, Cottage, &c., Crutchfield-lane	Walton-on-Thames U.D.C.	C. J. Jenkin, Civil Engineer, Council Offices, Walton	Aug. 17
Rebuilding Three Horseshoes Inn, Wroughton, Wilts.		W. Drew & Sons, Architects, 28, Regent-circus, Swindon	do.
Additions to Homes, Rothwell, Haigh	Hunslet Guardians	W. E. Richardson, Architect, Rothwell	do
Gymnasium, Neath	County School Governors	D. M. Jenkins, Architect, Gwyn Hall, Neath	do.
Addition to and Renovation of Liberal & Radical Club	The Committee	The Secretary, 213A, Barking-road, E.	do
Granite Kerbs and Channels	Garston (Lancs.) U.D.C.	Surveyor, Public Offices, Grassendale, W. Liverpool	Aug. 19
Mission Room, Hyde, Brimscombe, Glos.	Whitchurch School Board	G. P. Milnes, Architect, Town Hall Offices, Stroud	do.
School Buildings, near Cardiff		R. & S. Williams, Architects, Wharton-street, Cardiff	do.
Blocks of Conveniences, &c., Holywell Green	Whitchurch School Board	W. C. Williams, Architect, 29, Southgate, Halifax	do.
House, West Didsbury, Lancs		J. Cartwright, Market Place, Bury	do.
School	Strand Union	R. & S. Williams, Architects, Wharton-street, Cardiff	do.
Alterations, &c., to Sanitary Arrangements at Wkhouse	London County Council	A. A. Kekwick, Architect, 18, Outer-temple, Strand	Aug. 20
Addition to Bakehouse, Bethnal Green	Bristol Corporation	Architect's Department, 18, Pall Mall East	do.
Disinfecting Station, Feeder-road	Batley Corporation	T. H. Yabbicom, Civil Engineer, 63, Queen-square, Bristol	do.
Electricity Works	Rochester Corporation	J. C. Barraclough, Engineer, Market Place, Batley	Aug. 21
Cabmen's Shelter, &c.	West Lancashire R.D.C.	W. Banks, Civil Engineer, Guildhall, Rochester	do
Pavilion at Hospital, Aughton	London County Council	Rawcliffe & Seward, Architects, Fishergate, Preston	Aug. 22
Erection of Dwellings, Rotherhithe	Birkenhead Corporation	Architect's Department, 18, Pall Mall East	Aug. 23
Mortuary, Livingstone-street	Winsford U.D.C.	C. Brownridge, Civil Engineer, Town Hall, Birkenhead	Aug. 27
Sewer and Works in connexion	Metropolitan Asylums Board	Surveyor to Council, Market Place, Winsford	do.
Seaside Homes, Rustington, near Littlehampton	do.	Rowland Plumbe, Architect, 13, Fitzroy-square, W.	Aug. 28
Alterations, &c., to Laundry, Leavesden Asylum	St. George's Union	Newman & Newman, Architects, 31, Tooley-street, S.E.	do.
External Staircase at Workhouse, Fulham-road	The N. Wales Counties Lunatic Asy.	E. T. Hall, Architect, 54, Bedford-square, W.C.	do.
Additions to Asylum, Denbigh	Middlesbrough Corporation	T. M. Lockwood & Sons, Architects, Chester	Aug. 30
Extensions of the Borough Asylum, Middlesbrough	Enfield School Board	The Clerk, Municipal Buildings, Middlesbrough	Sept. 2
Junior Mixed School, Enfield Lock	London County Council	G. E. T. Lawrence, Architect, 22, Buckingham-street, W.C.	Sept. 3
Additional Outfall Sewers at Crossness	Gillingham & Grange U.D. Sch. Bd.	Engineer's Department, County Hall, Spring Gardens, S.W.	Oct. 8
Vicarage House, Horningham	The Committee	H. F. Price, Architect, Weston-Super-Mare	No date
Board School for 1,250 Children	Mr. J. E. Lyne	H. D. Pearson, Architect, 27, Chancery-lane, W.C.	do.
Enlargement St. Cuthbert's Church, Thetford	Malton (Yorks) Gas Co.	Arthur J. Lacey, 6, Upper King-street, Norwich	do.
New Bridge over Thames at Whitchurch	Trustees of the Earl of Wilton	J. Morris & Sons, 156 Friar-street, Reading	do
Additions to No. 8, George-street, Hull	Mr. J. Storrar	Freeman & Co., Architects, Carr-lane, Hull	do.
Buildings at Gasworks	Downham Market Gas Co.	H. Tobey, Engineer, Gas Offices, Malton	do.
Additions, &c., to Houses and Shops, Radcliffe		J. Sellers & Son, Architects, Union Chambers, Bury, Lancs	do
Additions to Premises, Chester		J. H. Davies & Sons, Architects, Newgate-street, Chester	do
House at Gasworks		Jarvis & Son, King's Lynn	do.
Pair Cottages, Worplesdon, near Woking		G. Howard, Prey Heath, Worplesdon	do.
Additions, &c., to Hotel, Rugby		J. T. Franklin, Architect, 40, Bridget-street, Rugby	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Railway Surveyors	Western African Railway	30*l.* to 70*l.* per month	At once.
Mains Superintendent	Hastings	150*l.*	Aug. 13
Lecturer in Mechanical Engineering	Preston Technical School	150*l.*	Aug. 14
Assistant in Engineer's Office	Birmingham, Tame, and Rea D.B.	130*l.*	Aug. 15
Surveyor	Bridgewater	225*l.*	Aug. 17
Resident Electrical Engineer and Manager	Finchley U.D.C.	300*l.*	Aug. 19
Inspector of Nuisances	Newton Abbott	150*l.*	do.
General Manager	London Pacific Cable Board	.....	do.
Electrical Engineer	Bedford Borough	350*l.*	Aug. 20
Works Manager	Swansea Corporation	.....	Aug. 24
Instructor in Smith's Work	West Ham Technical Institute	.....	Aug. 30
Instructor in Foundry Work	do.	.....	do.
Professor of Engineering	Bristol University College	.....	Aug. 31
Building Inspector	Maldens and Coombe U.D.C.	120*l.*	Sept. 1
Shift Engineer	Battersea Borough	104*l.*	Sept. 3
Chief Engineer	London County Council	2,000*l.*	do.
Borough Surveyor	Fulham Borough Council	400*l.* per annum	Sept. 4
Electrical Engineer	Cape Colony	500*l.*	Oct. 10
City Engineer and Surveyor	Cape Town	1,500*l.*	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. —.* *Contracts, pp.* iv. vi. viii. x. & xxi. *Public Appointments, pp.* xix. & xxi.

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
" " galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
" " 22 g. and 24 g	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 7 6	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin "	0 1 2	- - -
Copper nails "	0 1 2	- - -
BRASS—		
Strong Sheet "	0 0 11	- - -
Thin "	0 1 1	- - -
TIN—English Ingots "	0 1 5	- - -
SOLDER—Plumbers' "	0 0 7	- - -
Tinmen's "	0 0 8	- - -
Blowpipe "	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 0	per ton delivered.
Fine "	38 0	" "
Coarse Keenes and Parian cement	51 6	" "
Fine do. do.	59 6	" "
Robinson's Fireproof Cement	51 6	" "
Do. Finishing "	56 6	" "
(Exclusive of the ordinary charge for sacks.		
Whiting	30 0	" "

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d. per ft. delivered.
" " fourths	3½d. " "
21 oz. thirds	3½d. " "
" " fourths	3¾d. " "
26 oz. thirds	5d. " "
" " fourths	4¼d. " "
32 oz. thirds	6d. " "
" " fourths	5¼d. " "
Fluted sheet, 15 oz.	3½d. " "
" " 21 "	4¼d. " "
½ Hartley's Rolled Plate	3d. " "
⅝ " " "	3½d. " "
¾ " "	4d. " "

PRICES CURRENT (*Continued*).

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 10
" " " in barrels "	0 2 11
" " " in drums "	0 3 1
Boiled " " in pipes "	0 3 0
" " " in barrels "	0 3 1
" " " in drums "	0 3 3
Turpentine, in barrels "	0 2 4
" in drums "	0 2 6
Genuine Ground English White Lead per ton	23 0 0
Red Lead, Dry "	23 10 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

A. W. B.—G. R. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDEEN.—For new wing to complete extension of Blairs Catholic College, near Aberdeen. Mr. R. G. Wilson, architect, Aberdeen:—

Masonry.—Jas. King.
Joinery.—Jno. Henderson.
Slating.—Forbes Morrison.
Plastering.—Bannochie & Sons.
Plumbing.—Thorn & Strachan.
Painting.—Edward Copeland.
[All of Aberdeen.]

Schedules by architect. Total of accepted tenders, about £12,000.

BODMIN.—For additions, &c., to county asylum buildings to accommodate 400 patients, for the Cornwall County Council. Mr. Silvanus Trevail, architect, Truro, and Palace-chambers, Westminster. Quantities supplied:—

Wakeham Bros.	£121,087	Krauss & Sons	£92,335
Shillitoe & Son	111,176	A. H. Coles	92,105
King & Sons	102,700	Wilkins & Sons	90,850
C. Brealy	101,856	W. E. Blake	90,193
Thos. Rowbotham	101,500	S. Trehane	88,795
H. E. Skinner	99,156	Pethick Bros., Plymouth*	87,973
Willcock & Co.	94,300		
Patrick & Co.	94,009		

BRIDLINGTON. — For the execution of sewerage works, for the Town Council. Mr. E. R. Matthews, C.E., Town Hall, Bridlington. Quantities by engineer:—

G. W. C. Pearson, Hull* £7,771 18 4

BUCKINGHAM.—For the execution of water-supply works, Charndon and Twyford, for the Rural District Council of Buckingham. Mr. G. Roberts, engineer, Deanshanger, Stony Stratford:—

Gravitation Scheme.

Village 1½ miles away 40 ft. below Reservoir site.

E. & H. Roberts, Limited, Deanshanger Ironworks £901 3 4

Charndon Scheme.

E. & H. Roberts, Limited, Deanshanger Ironworks 627 14

CANTERBURY.—For alterations, &c., to old museum, Guildhall-street, for the Corporation. Mr. A. C. Turley, C.E., Tudor Chambers, Canterbury:—

W. J. Adcock	£783 11 2	C. Mount, Canterbury*	£564 10 0
Gann & Co.	630 0 0		

[City Surveyor's estimate, £650.]

CHAILEY (Sussex).—For the erection of hospital, house, &c., for the Rural District Council. Mr. H. Card, engineer, 10, North-street, Lewes. Quantities by Mr. H. Curtis Card, F.S.I.:—

H. Young	£4,998	Norman & Burt	4,498
J. Finch	4,899	W. Wells	4,474
Cook & Son	4,813	Peerless, Dennis & Co., Eastbourne*	4,244
Box & Turner	4,620		
Turnbill & Co.	4,600		

CHRISTCHURCH (Hants).—For the re-construction of Mews bridge. Mr. W. J. Taylor, surveyor, the Castle, Winchester:—

A. Thorne	£447	T. Tiller	£330
Jenkins & Sons	387	F. Osman, Sonthampton*	297

CLEETHORPES (Lincs.)—For the erection of stable, granary, &c., Poplar-road, for the Cleethorpes-with-Thurnscoe Urban District Council. Mr. Egbert Rushton, C.E., Poplar-road, Cleethorpes:—

	Stables. &c.	Roller House.
Waterman	£816 0 0	£259 13 9
C. Lewis	760 0 0	240 0 0
Wade, Limited, Cleethorpes*	712 6 6	193 4 0
Surveyors' estimate	698 0 0	180 0 0

COWDENBEATH (N.B.).—For the execution of drainage works for the Police Commissioners. Messrs. Buchanan & Bennett, C.E., 12, Hill-street, Edinburgh:—

Harvie & Co.	£3,602 14 5	John Martin	£2,719 0 5
Nimmo & Coupar	3,047 14 0	Mackay & Son	2,662 11 4
Henderson & Duncan	2,949 3 7	W. Isbister	2,466 10 0
R. Brebner	2,838 10 0	W. Caragher	2,304 17 2
D. & J. Stratton	2,814 16 10	D. Gilmour	2,067 15 8
		James Kirk	1,859 12 0

[*See also next page.*

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DEWSBURY.—For the erection of four houses, &c., Thornhill-road, for the Pioneers' Industrial Society, Limited. Messrs. Holtom & Fox, architects, Corporation-street, Dewsbury:—

Masonry.—G. Broadbent, Ravensthorpe*	£678 4 11
Joinery—T. B. Bailey, West Town, Dewsbury*	229 0 0
Plumbing.—J. Stead, Batley-Carr*	50 0 0
Plastering.—A. & F. Hodgson, 14, Willans-road, Dewsbury*	76 10 0
Slating.—W. H. Thompson, Batley*	44 10 0
Painting.—S. Oldroyd, Dewsbury*	14 5 0

FRITH (Kent).—For the execution of private street works, Grosvenor-road, &c., for the Urban District Council. Mr. A. W. Jennings, Surveyor, Council Offices, High-street, Erith. Quantities by Surveyor:—

Wilson, Buder, & Co.	£2,716 1 5	H. C. Soan	£2,159 13 6
T. Adams	2,498 3 0	W. H. Wheeler	2,050 8 6
Fry Bros.	2,453 14 2	Lawrence & Thacker	2,009 8 8
Free & Sons	2,166 0 0	R. Ballard, Child's Hill*	1,987 0 0
Woodham & Sons	2,164 4 0		

[Surveyor's estimate, £2,207 5s. 5d.]

HERTFORD.—For sewer works. Mr. J. H. Jevons, Borough and Waterworks Engineer and Surveyor:—

Meston & Hale	£1,251	Wallace & Inns (corrected tender)	£1,756
G. F. Tomlinson	1,136	A. C. Soan (corrected tender)	1,110
J. Jackson	1,102		
G. Porter	1,090		
A. T. Catley, London*	1,086		

LITTLEHAMPTON.—For the construction of reservoir, house, cottage, &c., Batworth Park. Mr. H. Howard, Engineer, Town Offices, Littlehampton. Quantities by Mr. C. F. A. Poland, John-street, Bedford-row, W.C.:—

Linfield & Son	£8,975 0	W. Wallis	£7,989 0
A. Burrell	8,366 10	A. E. Nunn, Tenterden, Kent*	7,863 2
Snewin Bros.	8,327 0		
Peerless, Dennis, & Co.	8,149 0		

[Engineer's estimate, £8,030.]

LONDON.—For Tollington School, Tetherdown, Muswell Hill. Mr. Alfred Conder, architect, Palace-chambers, Westminster:—

W. Akers & Co.	£2,255	T. D. Steed & Son*	£2,100

Subject to certain omissions.

NENAGH (Ireland).—For the erection of business premises, Castle-street, and St. Peter's-street, for Messrs. Hodgins & Co. and F. Day. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork. Quantities by Mr. William Butler, Dublin:—

Thomas Williams	£3,281	J. Burke, Venagh, co. Tipperary	£2,740
Cullen Bros.	3,233		
Lisk & Sons	3,138		

NORWICH.—For extensive additions to the city asylum, Hellesdon. Mr. A. E. Collins, C.E., Guildhall, Norwich:—

Coulson & Loft	£6,257 1 4	John Hurn	£5,792 0 0
Downing & Son	6,238 0 0	Chapman & Son	5,342 0 0
G. E. Hawes	5,958 0 0	H. C. Greengrass, Norwich*	5,206 16 3
Youngs & Son	5,957 0 0		
J. S. Smith	5,813 10 0		

[City Engineer's estimate, £5,525 17s. 1d.]

PATELEY BRIDGE (Yorks).—For the erection of minister's house, for the Primitive Methodist Trustees. Mr. Amos Chippindale, architect, Harrogate:—

David Lauson, Pateley Bridge	£450

STOKE-UPON-TRENT.—For the erection of three shops and warehouse, High-street, for Mr. J. H. Irwin. Messrs. R. Scrivener & Sons, architects, Hanley, Staffs.:—

Brain & Smith	£3,597 0 0	J. Bagnall	£3,210 0 0
R. E. James	3,447 12 2	Meiklejohn & Son, Stoke-on-Trent*	3,100 0 0
Tompkinson & Bettelley	3,305 0 0		

WATFORD.—For additions, &c., to Watford Field (girls') School for the School Board. Mr. C. P. Ayres, architect, Burvale, Watford. Quantities by architect:—

General Builders Co.	£3,497	C. Brightman	£3,115
A. E. Wilson, Ltd.	3,358	R. L. Tonge	3,025
G. Wiggs	3,312	Clifford & Gough, Watford‡	2,943
H. B. Watkins	3,227		
G. & J. Waterman	3,225		

‡ Accepted subject to the approval of the Board of Education.

WOODFORD (Essex).—For repairs, repainting, and cleansing works in connexion with the Churchfield Schools, Woodford. Mr. Edward Tidman, C.E., Architect to the Board, Connaught Mansions, Westminster:—

H. Wells	£155 0	Poole	£125 3
Osborne	126 0	F. Ranger*	124 10

For Similar Work at Woodford Green Schools.

H. Wells	£140 0	F. J. Hill	£78 0
Osborne	129 0	F. Ranger	62 0
Poole	124 1		

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The Builder.

VOL. LXXXI.—No. 3054. AUGUST 17, 1901.

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Parish Church and Rectory of S. Andrew, Stoke Damerall, Devonport.—Mr. W. D. Caröe, F.R.I.B.A., Architect .... *Extra Large Page Photo-Litho.*
New Premises, Cowcross-street, E.C.—Mr. E. W. Mountford, F.R.I.B.A., Architect ..... *Single-Page Ink-Photo.*
House, "Munstead Rough," near Godalming.—Mr. E. W. Mountford, F.R.I.B.A., Architect ..... *Single-Page Ink-Photo.*
Some Examples of Modern Leadwork..... *Double-Page Ink-Photo.*

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The Architect as Arbitrator.

IT is to the honour of the architectural profession—and in this, for the purposes of this article, we may include surveyors and engineers—that they have by degrees become invested with an actually judicial character in regard to part of their business. This result has been produced by recent judicial decisions, which, at first giving forth an uncertain sound, have gradually become more and more clear, until at length, by the decision in the present year of the Court of Appeal in the combined cases of Chambers *v.* Goldthorpe and Restell *v.* Nye, the question has been placed beyond a shadow of doubt. "I think that the effect of the architect agreeing to act under Clause 20 as to the granting of certificates was that he undertook the duty towards both parties of holding the scales even and deciding between them impartially as to the amount payable by the one to the other, . . . he was in the position of a person who had to exercise functions of a judicial character as between two parties." These words of the Master of the Rolls state definitely the position of the architect, surveyor, or engineer when the duty is cast upon him of deciding on the rights of the building-owner and the contractor, and they settle a question which has been in an uncertain state for the last twenty years. It is therefore with some surprise that in a book which specially deals with the engineer or architect as arbitrator between the employer and the contractor* these important cases before the King's Bench Division are not dealt with.

It is certainly very important that the difference in the several functions of the engineer or the architect should be clearly understood, for in one position he is simply the agent of his employer, in the other he is a judge between two parties. We are all accustomed to see architects and surveyors appointed as arbitrators, but they are usually so appointed, to use a legal and a diplomatic expression, *ad hoc*, for a special purpose at a special time. But the architect as arbitrator under an ordinary contract is appointed by the contract between the employer and the contractor. Unlike an ordinary arbitrator, he is not in a sense an impartial person; he has been and still is acting as the agent of one of the parties. The fault of the book to which we have already referred is, in our judgment, that it confuses the two characters of the architect. For example, it is usually stipulated in a contract that the contractor shall not do any extra work, or deviate from the agreement, without the written instructions of the architect. In giving these written instructions the architect is simply and solely the agent of the employer. But when the contract comes to an end, and he has to give his final certificate, he becomes a judge — unless the certificate is given the contractor is not paid. "The complete separation of the functions of directing the contractor as to the work to be performed, and of approving work after it has been performed, enables the former to be regarded as functions of the agent of the employer, and the latter as those of an arbitrator, not in the sense of one who adjudicates on remedial rights arising by law upon a breach of contract, but in the sense of one who is called upon to determine whether the contract undertaken has, or has not, been fulfilled" (p. 68). But whatever the exact form in which the functions of the architect as arbitrator are clothed, he is essentially for the time being a judge, one who has to exercise judicial functions, who should approach the matter before him with absolute impartiality, and whose decision cannot be set aside unless it is vitiated by fraud or gross misconduct.

The author of the work in question might well have said something upon what may be called the legal morality of this question. It is not an easy thing for any man, however fair-minded, suddenly to have to put off a feeling of protection for his employer in order to come to a decision which may even involve a certain condemnation of himself. For instance, extras, according to a contract, are not to be undertaken without an order in writing. But over and over again this clause is neglected. Some extra has to be done. "Shall I go on with it?" asks the builder. "Yes," replies the architect, in a hurry to catch a train. Presently comes the final settlement and the final certificate, without which the builder cannot obtain a penny of the final amount. Difficulties arise in regard to these particular extras; the employer is a man tenacious of his rights, the architect is placed, as a matter of fact, in the position of sitting in judgment on himself as well as of deciding the respective rights of contractor and employer. In one case at any rate, that of Kemp *v.* Rose, decided so long ago as 1858, the Court held that it was entitled to reverse the decision of the architect because he had not approached this part of his duty with an unbiassed mind. As a matter of fact, he had given an assurance to the employer that the cost of the works would not exceed a certain amount. By the contract he was constituted sole arbitrator as to the measurement of extras, or any accounts for extras, and as to the allowance of such claims, and all other matters.* This fact, in the opinion of the Court, caused him to have a biassed mind, since he had a very strong motive to cut down the claim of the contractor so as to bring it within the amount which he had mentioned to the employer. Though this is a useful illustration of a practical difficulty, it must not be taken that this case would now be followed, since the tendency of the courts seems rather to be to assume that the architect is, as it were, suddenly clothed with new functions, and one may almost say, a new frame of mind; that he is capable of exercising a kind of duality of functions, and will proceed to act fairly and judicially the moment he begins to exercise his

* "The Engineer or Architect as the Arbitrator between the Employer and the Contractor and his Other Functions under Building Contract." By Charles Currie Gregory. London: William Clowes & Sons. 1901.

* Gregory, p. 307, Roscoe's "Digest of Buildin Cases," p. 6.

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judicial functions. It is obvious that a mere statement to an employer, somewhat vague, that a building will not cost more than 1,000*l.* or 2,000*l.* as the case may be, does not in reality create a greater bias in the mind of an architect than many circumstances which may arise in the course of a contract. For example, in an American case it appeared that the architect had to decide whether certain work was work within the meaning of the contract, this same work having apparently been necessitated by his own error in furnishing working plans. In fact, the more the question of the two functions of the architect and engineer is carefully considered, the more important and far-reaching appears to be the result of recent judgments which have so greatly developed what may be termed the judicial theory in regard to an architect's functions. How difficult the position in which the architect is placed has become, and how much more trying it is than when he is called on to act as arbitrator between parties with whom he has had no previous connexion, is well shown in the following passage from Mr. Gregory's work:—

"An arbitrator, in the strict sense in which the term is used as a person to whom, alone or in conjunction with others, a right of action is referred for arbitration instead of to a court, can no more make a valid determination without granting the parties an opportunity of presenting their respective sides of the case, in the presence of each other, at a formal hearing, than a court can do so.

But where in a contract it is provided that the engineer or architect to be appointed by the employer for the direction and superintendence of the work shall certify the completion of the work, or the amount to be paid to the contractor, or the fulfilment or measure of any other contract undertaking, the intention is not that he shall, before so certifying, be required to afford the parties an opportunity of a formal hearing. It is his own knowledge and skill, and his own observation and that of his subordinates, that it is intended he shall act upon, and not upon facts to be established by the evidence of witnesses, nor upon the opinions of expert witnesses."

This statement strikingly shows the difficulty of the position, for not only has the architect to shake himself free from all bias, he has also to decide without the assistance of the parties. In the above extract there is a remark which, however, requires notice—"that of his subordinates." In the case of Clemence *v.* Clarke, decided in 1880, and strangely omitted from Mr. Gregory's book, it was ruled that a total delegation of work to a subordinate might vitiate a final certificate, which is, in a sense, an award. "If, indeed," said Mr. Justice Grove, "the architect had delegated the whole of his duty to another person; if he had taken another person and paid him a smaller sum of money than probably he would be entitled to; if he had taken a man of inferior station to supervise and look over all the work instead of himself, and had abdicated his functions wholly in favour of another person, that would have been a ground for setting aside the certificate, because in that case it would have amounted to misconduct." In that particular case, his conduct was impugned because he had had the work measured up by a quantity surveyor, but the partial delegation was considered to be justifiable, because an architect need not and could not in some cases go personally into all the details of the work. This case, however, is illustrative of the various small practical difficulties which may arise. And, indeed, it is not unworthy of notice that the whole dispute arose, as it would seem, from the unfortunate wording of the final certificate:—"I hereby certify that A B is entitled to receive the sum of £—— to balance account of works, *as certified by the measuring surveyor* to be the final amount due thereon, executed by him at —— (Signed) C D, Architect." Had the words which we have italicised been omitted the point would never have been raised; showing that an architect should simply and solely certify what amount is due to a contractor. In addition, however, there are larger and more theoretical questions, to which allusion has already been made, which may arise during the time that the architect is acting as arbitrator, not under a formal submission by two strangers, but under a contract between two parties, the contractor and the employer, by which, strange as it may seem when nakedly stated, the contractor binds himself to accept the award of the agent of the person for whom he is to work, and who during the course of the contract must necessarily—except in this particular instance—look only to the interests of the employer.

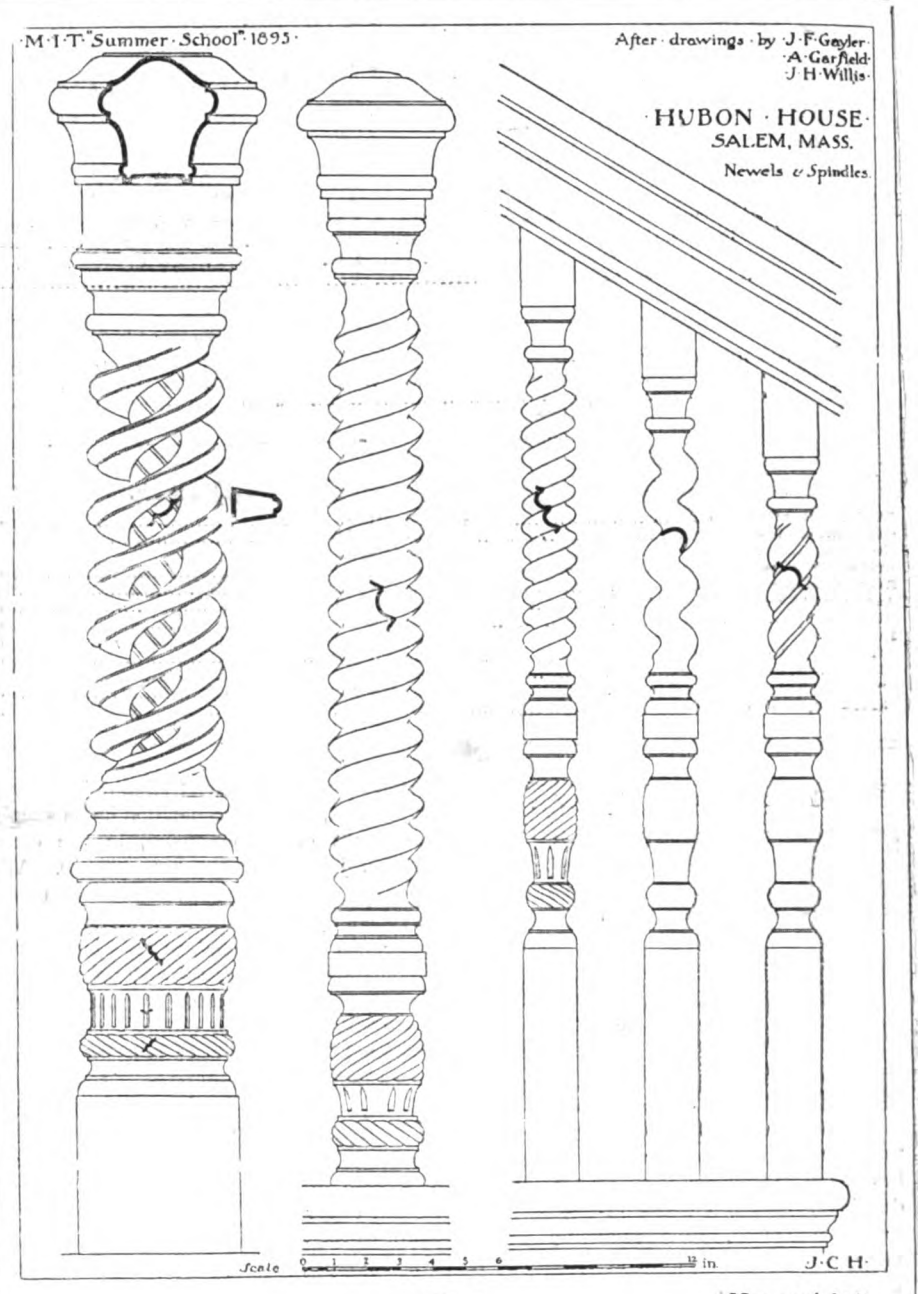

Fig. 1. [*See next page.*

COLONIAL ARCHITECTURE IN AMERICA.

ABOUT the architecture of the Georgian period in America, commonly spoken of in the States as "colonial architecture," or that of the buildings erected by the colonists before the Union, there is a great deal of interest both from its resemblance to and its difference from the architecture of the same period in the mother country. In the general aspect and style of the colonial buildings the resemblance is very strong indeed; it is the same style carried out on foreign ground. The principal differences arise from the influence of new circumstances, of which the most powerful is obviously that of material. The architectural forms carried out in England with brick and stone, or brick with stone columns and other accessories, was carried out in the American colonies to a great extent in wood, as the most plentiful and most easily worked material of the new country. Hence arose new proportions in the orders employed in porches and doorways. The classic column was elongated into tall and slender proportions quite logically expressive of the difference in the quality of the material; and the pro-

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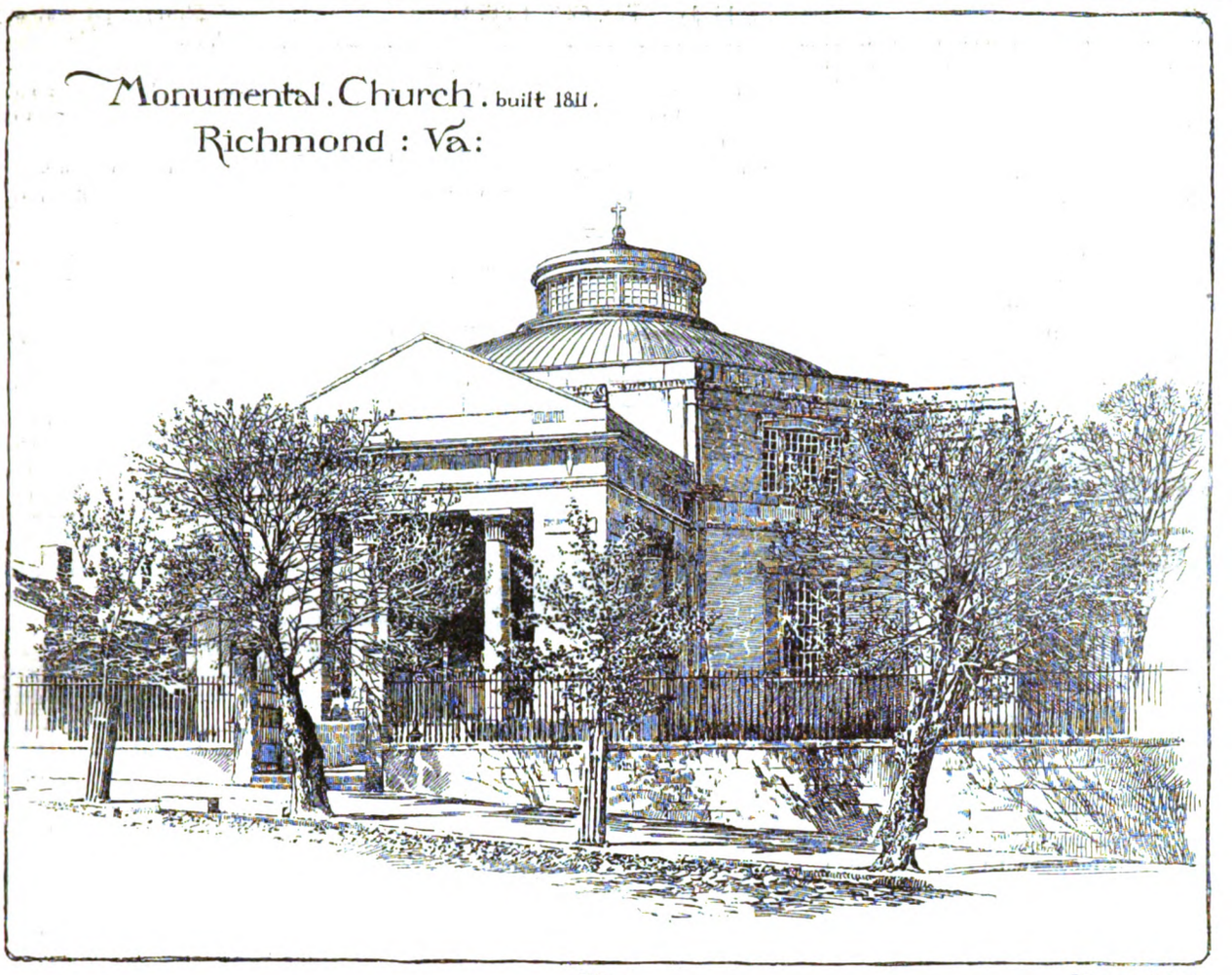

Fig. 2. [*See next page.*

portions which would have appeared bad, because practically fragile, in a stone column, appear quite satisfactory and in good taste in a wooden one. The extensive use of wood also gave rise to a good deal of special elaboration of wooden detail. In England the wooden balusters of stair-railings, though often much thinner than anything that could be made in stone, preserve for the most part the simplicity of character of the stone baluster. The colonial joiner indulged himself with fancies in corkscrew work, as in the newell from Hubon House, Salem (fig. 1), making one spiral design appear to run the contrary way through the centre of another; a device not admirable in itself, but amusing as showing the workman making the most of his skill in handling the chief constructional material available.

The large collection of measured drawings and other illustrations published in a series of articles in an American architectural journal, and since issued in portfolios as a separate publication,* brings within the reach of English architects a complete survey of this class of American work, so closely connected in history and association with English architecture. An introductory essay, with a number of small sketch illustrations, gives an analysis of the varieties found under different dates and in different neighbourhoods.

In the domestic architecture the treatment of the doorway closely follows that of the English precedent; as in the typical Georgian country house in England, the general building is a plain parallelogram, the small amount of architectural embellishment being concentrated on the porch, where, as already observed, the decorative column often assumes the long proportions of woodwork, but otherwise closely follows English precedent. It is noticed, however, that in Pennsylvanian houses the columned porch is commonly omitted, and the reason given for this (whether rightly or wrongly) is a curious one; it is that the Pennsylvanian settlers had gone through so severe a fight against the primeval forest, having to clear every piece of building ground from tree trunks, that they had had enough of shade and of anything approaching to the shape or reminiscence of a tree-trunk, and wanted no more of it. The explanation seems, however, a little too far-fetched.

In the southern provinces the influence of timber seems to have been less preponderating than in the north. "The aristocratic cavaliers who settled there differed in much from the Puritans." The great tobacco-planters loved the solitude of large country-houses; a solitude all the more complete in a country where the roads were mere bridle-paths. Many of these settlers were sons of prominent English noblemen, and had an inherited taste for comfortable and substantial houses. "They were the first among the American settlers to introduce glass for the lighting of rooms;" a passage we do not quite understand. Is it implied that the more northern houses at the early period of settlement were without glass in their windows? "Perhaps the inherited desire of the Virginia settler to live in dignity and splendour can best explain his preference for brick, in a country where wood was the most natural material, and where it was everywhere abundant." The rivers being the only safe and practicable highways, "each planter sought to have his own river-front, with a little dock to which the small English and Dutch vessels could come for barter." These characteristics seem to convey to the mind a vivid idea of the general style and surroundings of the old Virginia homestead.

The first illustration in the book, from a photograph of the Culver Homestead, in Monroe County, is characteristic enough of the influence of wood on classic architectural forms. We see a plank-faced house with a modillion cornice, and a large porch with Roman-Doric columns 14 diameters high, a wide boarded pediment over it, the flat return behind the cornice over the outside columns making a great shelf on each side, of no use for anything but to hold dust. It is a curious example of the tyranny of architectural precedent, for no one would have thought of building a wooden porch in this way but for the influence of masonic architecture. Turning over the plates, we come, in the illustration of the Fairbanks House, Dedham (Mass.), to an interesting example of the early framed house (this one was built in 1636), all of wood except the one lump of brick or stone in the centre of the plan, which takes the fireplaces and chimneys. This is a dwelling racy of the soil, but the examples of its furniture shown in the succeeding plate might all have been made in England. The wooden cornices from some of the old houses in Boston, largely founded on classic detail, have however a certain amount of novelty

* "The Georgian Period;" a collection of papers dealing with "Colonial" or eighteenth century architecture in the United States. Boston; the *American Architect and Building News* Company; 1899-1900.

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and variety of treatment. In the Philpse Manor house, New York (about 1745), we seem to see a Wren house done into wood, with its rows of prim windows all alike, with small square panes, and its two columned porches breaking the line of the ground-floor front. One of these porches occupies the natural position as a screen to the main entrance into hall and staircase; the other, exactly similar in treatment and importance, stands in front of a door opening straight into the kitchen. This house shows also a feature which occurs occasionally in English buildings, but which seems a special favourite with the colonial architect—a balustrade erected at the top of the slope of the hipped roof, and presumably surrounding a flat on the top (there is no section of the house given). The interior contained a good deal of rather elaborate carved ornament, a gracefully treated balustraded staircase, and a drawing-room ceiling diversified with symmetrical knots of foliage, and with two decorative panels enclosing portrait heads in relief. Three pages are given to designs of fanlights and glazed panels from Baltimore—whether that city was peculiarly addicted to this kind of decoration, or whether it happened only in this particular to have attracted an illustrator. The fanlights are much of the same type as we see in Harley-street and elsewhere in London houses of early nineteenth century date, only they seem to show rather more variety, and also occasionally more ambitious attempts in decorative glazing.

A good many of the churches—not those of the very earliest period—are curiously English in appearance, and the steeples, often very graceful, are obviously inspired by Wren. We give an illustration of one which is somewhat less English in character, what is called the "monumental church" at Richmond, Virginia (1811); a church with, as will be seen, a fine octagon plan with bays on the alternate sides, which owes part of its local character to that feature of the balustrading round the upper portion of the roof, already noticed. In this case one may suppose that the balustrade surrounds a skylight in the centre of the dome (here again there is no section); in that case it could have no practical use in such a position, and must have been regarded as an ornamental finish. The same feature occurs in the Pennsylvania Hospital, Philadelphia; a building which, but for this feature, might safely be presumed to be English.

The mantelpieces in many of the old houses show great refinement and delicacy of design and (if we may trust the indications in the drawings) of execution; they are all more or less on the Adam model, but with an occasional interesting novelty of detail. One of the most refined and graceful is that making part of the design of one side of the parlour in an old house, No. 1,234 in Washington-street, Boston, the illustration of which we reproduce.

This large collection of drawings illustrating the colonial architecture of the States is of great value as a record of a class of structures of great interest, many of which are from time to time being destroyed in the process of modern "improvements," or are becoming too dilapidated to be kept up any longer. American architects will no doubt use them as sources of inspiration in cases where it is intended to revive the colonial style; to English architects they can hardly have that kind of value, for notwithstanding the interest of these reproductions of Georgian architecture on a new soil, they are not equal to the originals in England, except in regard to some of the ornamental details of fireplaces, &c. And though they form a highly interesting chapter in architecture, one cannot but regret that the pioneer settlers on the other side of the Atlantic should have given themselves over so much to English precedent, and should not, after they had begun to get beyond the mere practical requirements of shelter and housing, have endeavoured to think for themselves a little more, and to have treated their stock material, timber, in a natural and unfettered manner, instead of following the forms of stone architecture so much. The writer of the introductory analysis, Mr. O. Z. Cervin, seems indeed to have had some such idea in his own mind, for he heads his essay with a quotation from one Eggleston (a novelist, we believe) to the effect that "Men can with difficulty originate even in a new hemisphere;" a dictum which the architecture of the "good old colony days" seems certainly to confirm.

NOTES.

The New Government Offices. MR. LEONARD STOKES, writing in Thursday's *Times* as one of the executors of the late Mr. Brydon, gives a clear and authoritative statement of the case in regard to the state in which Mr. Brydon's drawings were left. The drawings handed over to the Office of Works were but incomplete drawings of the carcass of the building, for the first contract, leaving all finishing for a second contract. "A number of ½-in. scale detail drawings," he adds, "are in existence, but many of these were hurriedly made to help the quantity surveyors to obtain a tender, and Brydon himself would have been the first to admit that these drawings required very careful reconsideration and revision." This statement renders the necessity for the appointment of an architect of the highest class, to carry out the building, even clearer and more decisive than before. A few days previously Professor Aitchison made an attempt to call attention to the importance of engaging an eminent architect to carry out the late Mr. Brydon's design, in a letter to the *Times* which is full of enthusiasm for architecture, and in the course of which he says—what in one form or another he has often said before—that there is no reason why we should not have as perfect an architecture as the Greeks, if we cared as much about it and took as much trouble to obtain the best architects. We should agree entirely with this gospel of hope if only one could get English people to care about it, but that is just the difficulty; and we fear that to the perceptions and sympathies of the average Englishman such a letter as that of Professor Aitchison will be addressed in vain. He makes, at the conclusion, a definite proposal that Dr. Rowand Anderson should be invited to carry out Brydon's work, as one who "has a name for being the best classic architect in the United Kingdom." We have not before heard this special and unique position attributed to Professor Anderson, but there could be no one better, except for the fact that he lives in Edinburgh, and it would be more convenient to have an architect living in London. We have, however, little hope that any one will be appointed, for the simple reason that the general public care nothing about it, and the Members of the Legislature still less. The Treasury have seen their way to effecting a small economy; and in comparison with that a question of the architectural treatment of a great building is, in their eyes, not worth considering.

The Easement of Light. IN the recently reported case of Greenhalgh *v.* Brindley, decided by Mr. Justice Farwell, which is to be found in the current number of the "Law Reports," the conclusion arrived at by the Judge was obvious. Still, decisions such as this prevent future litigation. Of course a grantor cannot derogate from his own grant but a grantor can give no rights over the land of other people in regard to the easement of light. In the present case a purchaser discovered that the vendor had made an agreement with the owner of adjoining land that no right of light should accrue to the vendor's property. On these grounds the purchaser objected to fulfil his contract. But as without this agreement the dominant tenement had not yet obtained a right to light, and as without this agreement the owner of the servient tenement could interrupt the light of the dominant tenement, the Judge held that the contract must be performed. All that was lost by the agreement was a vague possibility of obtaining a right to light at some future time. At the same time the Judge would not allow the vendor the cost of the litigation because in fairness he ought to have informed the purchaser before the contract of his covenant in regard to light, and left him to judge for himself whether it was or was not so detrimental to the property as to cause him not to buy it.

The London School Board Building Sites. THE unseemly dispute over a site in the Borough of Stepney for a site for a new school is at length ended. It is a curious instance of the difficulties with which the London School Board has to contend. The experts of the Board selected a site in Blakesley-street which was approved by the Inspector and was then scheduled in the Bill of the School Board. The Bill passed in ordinary course through the House of Lords and also a first and second reading in the House of Commons. Suddenly a small group of anti-educationalists, led by Lord Hugh Cecil, discovered that the site for the new school was an improper one, and asked that the Bill should on this point be referred to a Committee. This was done, and the Bill was passed by this body. Thereupon the opponents of the Bill said that it should have been referred, not to a small "Private Bill Committee," but to that larger body a "Select Committee." This demand was acceded to by the Government, and last week the Bill was again approved. The Borough Council of Stepney was represented by counsel, but there was no real opposition to the site, it only being said that the Blakesley-street site was too good for a Board school, whereas one would think that the better the site in such a district as Stepney, the more suitable it was for a school. As a matter of fact, no site can be chosen which pleases all parties, and if the School Board is to be harassed in future sessions by unreasonable objections

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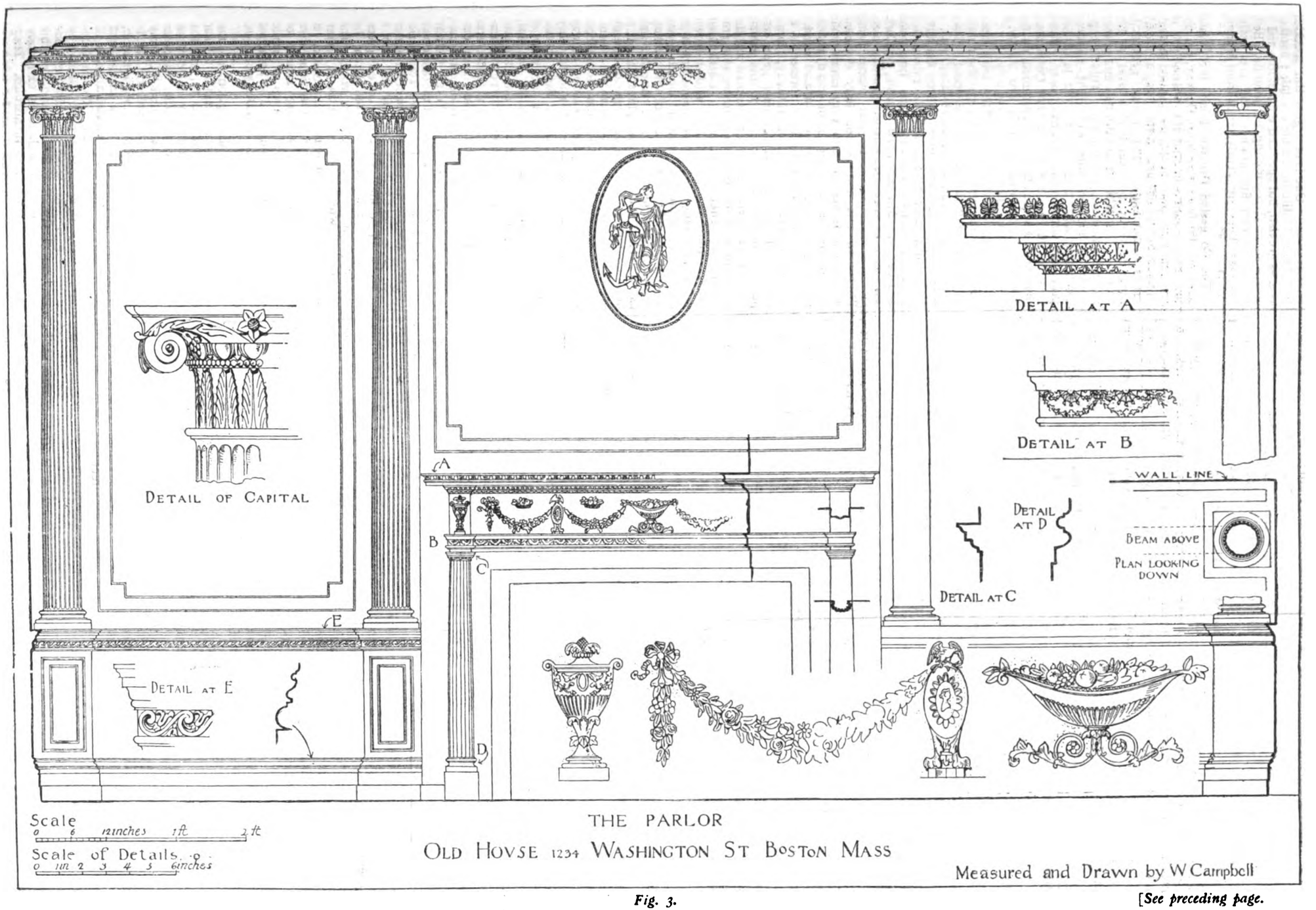

Fig. 3.

[*See preceding page.*

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to sites, the building operations will be greatly hindered.

The Free Grammar School, Abingdon.

Mr. John G. T. West, of Abingdon, has prepared plans and designs for the additions that are about to be made, at a cost of nearly 6,000*l.*, to the Grammar School at Abingdon. The charity was founded in 1563 by John Roysse, citizen and mercer of London, who endowed it with two houses in Birchin-lane, on a site latterly occupied in part by the London Assurance Company. Subsequent benefactions conferred upon the scholars a preferential right to election on to the foundation at Pembroke College, Oxford. A view of the old school buildings will be found in No. 940 of *The Mirror*, March 16, 1839. Thirty-two years ago the premises were rebuilt after Mr. Edwin Dolby's designs, which comprised five classrooms, two science-rooms, studies, and an infirmary. In 1897 a hostel for three assistant masters was erected, Mr. H. Redfern being the architect. The proposed additions will include a block of classrooms, laboratories, lecture-rooms, an art-room, a chapel, and a gymnasium.

St. James's Market, Jermyn-street.

We hear that the project has been revived of building a theatre on a site between Jermyn-street and Charles-street, Regent-street. The ground was formerly occupied by St. James's Market, built in 1666 for Lord St. Albans, of which a part was taken for the improvements carried out by John Nash and begun in 1813, under the provisions of the Act 53, Geo. III., c. 120. During the eighteenth century the market, which has latterly fallen into decay, enjoyed a high repute. The upper portion of the market-house was used by Nonconformist preachers, Richard Baxter being one of them. The Mitre Tavern was the home in her youth of Nance Oldfield, the actress. In the eastern corner house, on the south side of the poultry market, in Market-lane, leading into Pall Mall, lived the parents of Hannah Lightfoot, the Quakeress. Whilst residing there she first attracted the attention of the Prince (afterwards George III.) as he walked to and fro between Leicester House and St. James's Palace.

Architectural Association Students' Drawings.

The prizes offered to students by the Architectural Association have attracted a larger number of competitors than usual, nine designs being submitted for the Architectural Association medal, while six competitors tried for the Banister Fletcher Bursary. The subject set for the medal competition was a private school for fifty boys. The award has been made to the design under the title of "Pat McKann." The fault of this design is the inadequate lighting and ventilation of the stairs and corridor, which is not atoned for by the evident care that has been taken with the important details of school accommodation. Light, and the prevention of stagnant air accumulating, are far the most important considerations in a subject of this kind. The design under the device of a halfpenny stamp is, in our opinion, the best plan submitted, although it is on too small a scale throughout to be successful—*e.g.*, the kitchen is far too small to turn out dinners for fifty boys. In this respect, perhaps, the conditions for competitors might have been more clearly defined. The Banister Fletcher Bursary has been won by Mr. T. F. Green, with drawings of Morden College, Blackheath; the south porch of St. Margaret's Church, Ipswich; and the Brewers' Hall, Addle-street. Morden Hall is the subject of a capital set of drawings. Mr. Bossom's drawings of St Mary Woolnoth, which we recently published, are here, besides some others of Gothic work. Mr. A. R. Conder sends some measured drawings of Gothic work that carry us back to the careful mechanical draughtsmanship of many years ago, such as we see in the Gothic text-books. Some windows are well chosen, but an unfortunate note saying that "the design for the glazing is original" shows how little effect measuring old work has on some students, who can thus combine so much labour with such trifling. The works executed in the Studio are also on view. We notice throughout a too studied attempt at originality, and too little of those more trying academic exercises which, in our opinion, enable a student to master the principles of reasonable design.

BUILDING AND ORNAMENTAL STONES AT THE GLASGOW EXHIBITION.

Building stones are not well represented in the Exhibition, except in so far as Ireland is concerned. This is to be wondered at, seeing that the stone industry is one of the principal industries in Scotland. The numerous excellent sandstones found in Dumfries, near Edinburgh, and near Glasgow are practically unrepresented. Scotch granites are in evidence on one or two stalls, but the best exhibit of them, presently to be described, includes also some foreign stones, which seem to be rather out of place. English building stones are conspicuous by their absence.

The Irish building and decorative stones are grouped together in the Irish pavilion. Messrs. George A. Watson & Co., Ltd., of Tower-buildings, Liverpool, exhibit a very fine grained sandstone of grey tint from near Inistimon, on the West Clare railway. It is specially employed for paving purposes, including flagstones for footwalks, stairs, landings, station platforms, kerbing, channelling, and crossings, also as setts and cubes for streets, passages, &c. Cubes, kerbing and a slab are shown. The ports of shipment nearest the quarries are Liscanor and Kilrush. Mr. S. G. Fraser shows a dark grey stone slab from his Donegal quarries. One of the most serviceable stones exhibited is the fine-grained light blue granite by Lt.-Col. B. Gaele, from Glendoan quarry. It is not unlike the well-known blue-grey Aberdeen granite. To bring out the appearance of the material under varying conditions, a slab has been prepared the upper portion of which is polished, the central fine-axed, and the lower part left with a rough surface. We like this stone very much, though it would be still better if the minerals were not disposed in rough foliations; the rather large crystals of orthoclase felspar here and there impart a porphyritic aspect to the material, which takes an excellent polish. The Benduff and Fræ Slate Company, Eastview, Glandore, co. Cork, exhibits blue-black slates having a fine, even, and straight cleavage. The slate beds are said to outcrop over a hill of 900 acres in area and more than one mile in length. The nearest railway station to the quarries is Skibbereen, and the shipping port is Glandore. Some Valentia slates are shown, but at the time of our visit we could obtain no information respecting them. They are blue-black in tint; the specimens on view were not remarkable for their perfect cleavage, though the slate itself looked serviceable enough. The Killaloe Slate Company, Limited, of Nenagh, co. Tipperary, exhibits several blue-black slates of several sizes and of fairly even surface. The quarries are situated at Corbally, and are worked in strata of Lower Silurian age. They lay open a vertical section of over 400 ft., and produce slates from 10 ft. square downwards. The Valentia slates, which are quarried in the Devonian series, are rather greener in tint than those from Killaloe. The Arigna Mining Company, Limited, Ballinamore, co. Leitrim, have some large cubes of grey stone. The Earl of Leitrim exhibits some large, grey granite cubes. One is of a grey tint speckled with black biotite in minute crystals; another is also greyish, but speckled with biotite and a green mineral resembling hornblende. Both cubes are very fine grained, and are useful granites. They, apparently, come from Milford, co. Donegal.

The Congested Districts Board for Ireland have granite from Barna, co. Galway, not unlike Shap granite in that the phenocrysts of orthoclase are pink in a finer-grained groundmass of lighter-coloured orthoclase, and dark green hornblende. The Barna granite is represented by one small slab and a thin column. The Board also exhibits some granite from Shantallow, co. Galway. This is composed of mottled pink and light-coloured orthoclase with black specks. It is of fine grain and when polished is handsome. There is also a small polished column of Connemara marble and some others not described, on the stall. The agents for all these are Messrs. J. Miller & Sons, Marble Works, Galway.

The most attractive part of the Irish stone exhibits is the series of large polished slabs mounted along the top of the stand. They may be described as follows:—Castlegar, a black and greyish limestone from co. Galway; the central part of the slab is raised and polished, whilst the margins are fine-tooled and dulled. Middleton red marble, co. Cork. This is a crushed and foliated marble brecciated throughout, the angular pieces being lighter in tint and ornamentally disposed. The whole is veined with very small white calcite veins mostly running in one direction. Chimney-pieces, panels, pilasters, and slender shafts for buildings have been formed of it. "Irish green," from co. Galway, forms another pretty slab. It is a deep green serpentine, and for the purposes of this exhibit the slab has been cut down the centre and the two halves have been laid side by side, producing an effective pattern. Castleisland "red," from co. Kerry, is a reddish-brown breccia, the larger fragments being lighter in tint than the cementing material which forms the background; this marble is of sombre hue, and suitable for subdued effects. Another slab called "Irish green" is an ophicalcite; it is more contorted than the deep green already mentioned, and bears considerable resemblance to some of the Eozoon limestones from Canada. The Irish serpentines from Galway are nearly all ophicalcites—that is to say, they are not true serpentines in that they contain much calcite. From the point of view of effect they are probably the better for that, and another result is that larger slabs are produced than would be possible with true serpentine. They are known by the generic term "Connemara marble," and have been employed for many years for ornamental purposes. The ophicalcites in West Galway occur in irregular beds, amongst metamorphic schists and quartzites. There are two varieties, according to the observations of Professor Hull. One variety from Letterfrack is of a dense, opaque, and uniformly deep green colour, and appears to be derived from the metamorphism of a hornblende rock. The other variety, which is regarded as of higher value, is derived from dolomitic limestone. It occurs in the form of bands and laminæ, often twisted and tangled, of varying shades of green, and interlaced with bands of white calcite or crystalline dolomite. The principal quarries are at Lissoughter Hill, Ballynahinch, and the neighbourhood.

To continue with the description of the polished slabs: "Cork red," similar to that from Middleton already alluded to, but the pattern has a more fragmentary appearance and there are no small white veins. Another slab is composed of the celebrated "Galway black," which takes a good polish. It is quarried along the shores of Lough Corrib, and blocks of 12 ft. to 14 ft. in length, and even larger, 4 ft. to 5 ft. wide, and about 1 ft. in thickness have been raised. Rooska limestone, county Galway, is a deep black-grey crinoid stone, the crinoids showing conspicuously in section. An inspection of this stone reminds us that Ireland is extremely rich in carboniferous limestone marbles. They have much to recommend them, for none are of gaudy tints, all being grey and blue-grey, merging into black, and for the most part relieved by innumerable sections of crinoid

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stems which impart a pleasing but unobtrusive pattern. They closely resemble the Derbyshire "fossil" marbles, and some from Devonshire and the Isle of Anglesey. Another slab shown in the Irish pavilion is "Erne fossil" marble, county Fermanagh, which is light grey in tint and crowded with crinoids, some of which are of light pink tint, which gives a unique appearance to the stone. An occasional light calcite vein runs through the whole. The pink tint is doubtless due to the presence of a small quantity of limonite. Another slab from Middleton, county Cork, is a red and light blue mottled marble, with parti-coloured unobtrusive veins, except for some of the larger veins, which are white, with traces of light pink. From Moneen, co. Westmeath, comes a dark grey-black marble, with light grey straggling patches variegated with darker parts. The next slab mounted on the stand is again from Middleton; it is a metamorphosed limestone, with large straggling light and dark pink pieces; the background is variegated, mostly yellowish grey in tint, with traces of light pink, the whole veined in lighter tints of the same character. Another crinoid marble is from Clonowen, King's County; in this the fossils are very large, and the stone is so much like the dark large-patterned Derby marble that they might be readily mistaken for each other. Edenry limestone, co. Kildare, is a dark grey, very fine-grained speckled marble. The whole of the marble slabs just described are exhibited by Messrs. E. & S. Glanville, of Dublin. They are the most characteristic of Irish marbles, though they are not so well known to English architects as they might be, except the blacks and greens, which have been employed in the United Kingdom for many decades. They are worthy of careful inspection, though the visitor will find that the officials in charge know nothing about them—at least that is what we experienced—and the stones must perforce be left to tell their own tale. A little handbook would be extremely useful.

Passing from this general exhibit, we may notice the column of Kilkenny shell marble exhibited by Mr. Richard Colles, of the Irish Marble Company, Kilkenny. This marble, known all over Europe and America, is deep black, with occasional white sections of calcite shells. These latter, however, are not always conspicuous, and enormous blocks are raised which are perfectly black—a great rarity in marbles. The Kilkenny marble takes a beautiful polish, and when first cut is quite black. Professor Hull says that the organic matter to which its blackness is due gradually passes off. We can hardly agree with this, however; for the writer has had specimens of this marble for nearly twenty years in his possession, and they are as black now as ever they were. Perhaps they came from other horizons than those referred to by Professor Hull. In any case, the excellence of this black marble will not be disputed by those architects who have used it, even though the white shell-marks will occasionally appear on the best slabs and columns.

Other Irish stones exhibited are a slab and column of Shantallow granite, which is very fine grained, has pink and greenish orthoclase, not much black mica, and a little hornblende. There is a round polished slab of green igneous rock from Lambay Island, called porphyritic andesite on the sample. It closely resembles the *vert antique* of the ancients, and the rock has attracted considerable attention for some years. The ancient green porphyry of Greece, with large pale green crystals of plagioclase felspar, is technically a diabase-porphyrite; and the Irish rock now alluded to from Lambay Island, near Dublin, is of similar character. Connemara marble is again represented by a large flat table top mounted on a pedestal. Soapstone is represented by specimens from near Dungloe, co. Donegal; they have been sent by the Donegal Soapstone Syndicate, Limited, of Manchester. They are said to have been obtained from "Dungloe quarry"; as a matter of fact they have no doubt come from Crohy Head, where the soapstone has been dug from a vein running up the side of a precipitous cliff. The last time we visited the locality a tunnel had been driven in, and attempts made to mine the material.

We cannot close these observations on the building stones exhibited in the Irish pavilion without expressing our appreciation of the careful manner in which thoroughly representative stones only have been brought together. We could wish that more actual building stones (as distinguished from those used for decoration) had been shown also, but we presume it was thought that the most suitable materials for an exhibition outside of Ireland would be those which, for the most part, were of an attractive character. At the time of our visit many of the specimens were not very effectively displayed, and some were, we are sorry to say, labelled with the wrong names and localities. We have reason to believe, however, that that has now been put right.

Scotch granites and stones are present mainly on one stall or enclosure out in the grounds, and the exhibitors are Messrs. Alexander Macdonald & Co., Limited, of Aberdeen. If the exhibit is not an extensive one, it at least has the merit of showing some of the best known Aberdeen granites. It suffers from not having any description, however, and the visitor is left to his own knowledge as to what the stones really are, or where they come from. At least, that is what we found when visiting the grounds. Amongst the finished granite monuments, &c., we noticed a runic cross in fine-axed red Peterhead, which was remarkably uniform in tint. There is also a basin with ornaments rising from the centre of a pedestal of the same stone polished. The use of Peterhead hornblendic granite is again exemplified by a tall polished column, with turned cap and base. There is a polished tombstone of blue-grey Aberdeen granite, which has dog-toothed ornaments round the margins, the pattern being brought out by part being sunk. That part is dull, and the remainder polished, except for the base on which the upper part of the stone rests. There is also an ornamental carved tombstone surmounted by an urn, all dull or fine-axed, and light grey in tint. This presents the appearance of Kemnay stone. Close by in the same exhibit is a large cross mounted on a massive square base with sunk surfaces. It is polished, and is of a very deep red tint, the orthoclase present being fine and uniform. This is doubtless a Scandinavian stone. Another object is a pedestal having square mouldings and sides on a square base. The whole is of polished, light, coarse-grained Laurvikite; the felspar phenocrysts have a conspicuous pearly lustre. This is also a Scandinavian stone, much used on account of its attractive appearance. It is sometimes called "labradorite" in the market, but it is in reality an augite-syenite—if a scientific term is to be used in connexion with it for trade purposes. The stone is closely allied to certain nephelite-syenites, and occurs amongst the Devonian intrusions of the Christiania district. Alkali felspars make up the bulk of the rock, and are often intergrown with one another. Lying on the ground within Messrs. Macdonald's enclosure are several short lengths of polished granite columns, such as red Peterhead, grey Aberdeen, and some Swedish varieties.

Not far away, also in the grounds north of the river Kelvin, Messrs. Davies & Sneade, of Liverpool, have some French burr-stones, used for milling, doubtless from La-Ferté-sous-Jouarre, in the Paris basin. This is a breccia, the fragments being almost entirely of a siliceous character and bound together by a hard siliceous matrix. Another stone on the same stand resembles millstone grit, and a third variety is a coarse brown sandstone.

The Moreau Marble Company, Limited, of Chelsea, has a large assortment of artificial marbles, chiefly made up in various forms, in the grand avenue. There is a mantel and chimney piece, partly inlaid with different colours. In the centre of the stand is a font of a deep brownish yellow colour, supported by small black pillars on a yellow base. Close by are some large slabs of the marble in various tints, also a clock stand, urn, columns, &c. There is one tall fluted column in yellow, with cap and base, the latter being brown veined, and the former deep brown. The stand also includes green-veined blocks, a large table top, and specimens of the stone from which the marble is produced. The average crushing strength of the stone before conversion is stated to be 2,867 lbs. to the square inch, and 4,148 lbs. for the same after treatment. Other experiments have shown that the average crushing strength before being subjected to the process is 2,926 lbs. to the square inch, and 4,050 lbs. afterwards. It is evident, therefore, that the alteration of the soft limestone employed into marble enormously increases the strength of the material.

Messrs. F. R. & C. H. Luke & Co., of West George-street, Glasgow, have a stand in the grand avenue, on which are displayed a number of building materials. There were samples of light and dark Shap granite; a baluster and column of the light-coloured stone shows the phenocrysts of pink orthoclase very conspicuously set in a lighter tinted background. A polished column of Ross of Mull granite of deep red tint is also shown. Several specimens of Scagliola marble are exhibited, including a tall red, fluted column, a green pillar having dark streaks, light green baluster, small slab samples of brecciated serpentines, &c. There are many samples of American slates of blue, grey-green, and olive-green colours; the turrets mounted on the top of the stand are covered with them. Some are fixed in such a manner as to show the method of using these slates in roofing and walling. Some peculiar terra-cotta slate slabs are also shown. The blue slates (called "Arfon") are quarried at Arvonia, in Virginia, others come from Slatington, and from Granville, New York. The roof of a house in the garden is covered with the terra-cotta slates.

In the same avenue, but at the opposite end, Marmor, Limited, of Finsbury-square, E.C., exhibit specimens of Greek marbles, fixed to the wall of the building. Prominent ones are a kind of green cipollino, some apparently serpentines and ophicalcites, light and dark green in colour, fine and coarse breccias, and red and pure white marbles. There is one large slab of white and red breccia, the red being mostly very bright and vivid, with blue streaks here and there; this breccia is very coarse and is suitable for decoration on a large scale. Some Greek marbles from Skyros, exhibited by the same firm, will be found on a wall of the Royal reception rooms; they are of several colours and appear to be chiefly metamorphosed limestones.

Some building stones are shown in the section devoted to Rhodesia, including red sandstone from Helenvale quarry, near Bulawayo; there is a fluted column and carved cap in fine-grained white sandstone, also from Bulawayo. Messrs. Sherriff & Burgbacher, of the same place, have a specimen of light greyish yellow sandstone of very fine grain, and cubes of red and white stone, all quarried near the town.

RAILWAY COMPANIES AND REBATES.

ONE of the most interesting and important cases which have been before the Railway Commissioners—involving the question of rebates to large customers—was decided last week against the railway company concerned. The applicants were the well-known firm of coal merchants, Messrs. Charrington, Sells, Dale, & Co., who complained that their trade rivals, Messrs. Rickett & Co., had been granted an undue preference by the Midland Railway Company, in the shape of a rebate of 1¼ per cent. on all their traffic, provided it amounted to not less than 140,000*l.* per annum. This arrangement was kept secret — a fact which weighed largely with the Commissioners in giving a verdict against the railway company. Their defence was somewhat weak and unconvincing, and as they had already terminated the arrangement complained of, it would appear that they had not much faith in their case. They could hardly have expected the Court to agree that the course they had pursued was "in the interests of the public," for, as the Commissioners remarked, the rebate assisted to establish Messrs. Rickett in a prominent position, and such arrangements must inevitably tend towards the monopoly of trade by the more powerful firms. This would be contrary to the main intention of Parliament in legislating against undue preference, and it will also be remembered that the Act of 1888 made it obligatory upon the companies to publish all their rates. The chairman remarked at the half-yearly meeting that the agreement with Messrs. Rickett was made in good faith, and it was considered that the enormous traffic put on the line by them entitled them to some discount on their very large bill. The judgment of the Court was that the arrangement had not been sufficiently disclosed to satisfy the requirements of the Act —though not a fraudulent concealment—and as the company have to refund the applicants 1 per cent. on the amount of their traffic for the past six years, it will take a good many small economies, such as the railway companies are just now seeking to effect, to

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enable the Midland Company to rectify their mistake.

A singular feature of the case was the sanction given by the Commissioners to an allowance of one-quarter per cent. in consideration of the volume of Messrs. Rickett's traffic. This appears to be a weak spot in the judgment. The allowance is a mere trifle—equal to ¼d. per ton on a tonnage rate of 8s. 4d.—but it apparently admits the principle of a rebate (or discount) to large customers after all. Looked at in another light, the Midland Company erred on the side of generosity, and allowed Messrs. Rickett five times as much as, in the judgment of the Commissioners, they were entitled to allow. The judgment does not fix the amount or volume of traffic below which no allowance is legal. The Railway Commissioners have always had a knack of finding some justification for a fractional proportion of charges which are called in question ; and although it can hardly be said that a compromise has been effected in the case under consideration, there is certainly just a flavour of compromise about the judgment.

There are so many other merchants who will consider themselves prejudiced by the 1¼ per cent. rebate, that the Midland will find it a very costly affair, and will possibly endeavour to get the decision modified. The chairman told the shareholders at Derby that he was not prepared to say that the directors would accept the decision of the Court as final ; but, as has been said, their case seems a rather weak one, and they may be content to console themselves with the reflection that they can quote this case as a sufficient ground for declining to entertain any applications for concessions of this nature in future.

ARCHÆOLOGICAL SOCIETIES.

Kent Archæological Society.—The forty-fourth annual gathering of members of the Kent Archæological Society was recently held at Maidstone. The business meeting was held at the Old Palace, under the presidency of Earl Stanhope. The Council, in their forty-fourth annual report, state that the Society is in a flourishing condition. It was incidentally mentioned that this was the third time the Society had met at Maidstone after an interval of nineteen years. During the past twelve months several valued members had been removed by death and other causes. Thirty-two new members had been added to the Society, whilst twenty-four awaited election. The Council embraced that opportunity of referring to the great public spirit shown by Mr. F. S. W. Cornwallis, late M.P. for Maidstone, in recently purchasing the ancient college at Maidstone, at a cost of 3,800*l.*, for the sole purpose of preventing its being acquired for commercial uses or threatened with destruction. In the last volume of the Society's "Archæologia" a paper was contributed by the Rev. G. M. Livett, on the remains of an early Roman building existing between the east end of All Saints' Church and the Palace at Maidstone. It was necessary to draw the special attention of the trustees of the Palace to this, the earliest masonry at present known to exist in the town. The report was adopted, on the motion of the Rev. Fairman, seconded by the Rev. Woodruff. At the conclusion of the business, Mr. Hubert Bensted conducted the members over the Palace, and read an interesting paper on its history. Afterwards the company adjourned to All Saints' Church, where the Rev. P. C. Joy read a paper on the historic edifice. In the afternoon, the party were conveyed in brakes to Leeds Castle, the route being through Mote Park. The beautiful grounds and ancient castle were shown to the visitors by Mr. and Mrs. Wykeham Martin. Mr. F. V. James, curator of the museum, read a short paper on the castle. He remarked that he would refer to it with regard to its position as an example of the military architecture of the Middle Ages, and of its strong position as a fortress. The castle stands upon three rocky moles, of which two are islands in a lake, and the third occupies the central part of the artificial bank, by which the walls are or were retained. Dealing with the chronological aspect, he said that in the Saxon period the keep was believed, on strong evidence, to have belonged to that period. Its construction at that time, in accordance with others of a like character, was a large truncated conical mound, surrounded by a deep ditch, on the inner edge of which a stout palisade of timber was placed, equal in defence to a wall, and strengthened by turrets and towers. The Normans took the Saxon forts as they found them, and Norman shell keep was the name given to them by changing Saxon buildings of wood into fabrics of stone. The earliest masonry represented by a vaulted cellar was believed to be the work of Robert Crevecoeur, who founded Leeds Priory in 1119. The lower portion of the old castle, and the chapel, with its windows of geometrical tracery, are assigned to the period of Edward I., and belong to the Early English style, A.D. 1280. Extensive alterations did not take place till the time of Henry VIII., when the upper story of the old castle and the Maidens' Tower were built. Tradition supposes this tower to have been built for the Maids of Honour, but a later conception is that the appellation is a corruption of the word main or principal tower. While in possession of the Smith family of Strangford ancestry, an Elizabethan mansion was erected in the seventeenth century at the north end of the large island, and in 1822 the present mansion was erected, and during the progress of the work many of the remains of the former building were discovered.—Leeds Church was also visited, and described by Mr. Payne. The Vicar, the Rev. A. P. Morris, gave a short address. When he was appointed Vicar in 1877 the chantry was called the washhouse, as the water came through the ceiling. There were the old square pews, and when the galleries were taken away a fine old Norman arch was discovered. One of the old brasses found was in memory of one Catherine Lambe, who it was believed was the mother of the founder of the Co-operative Schools. —The banquet was held at the Town Hall, under the presidency of Earl Stanhope, who, in reply to the toast of the Association, said he hoped that the membership of the Society would soon reach 1,000. The members of the Society and a large number of townspeople were present at a reception held by the Mayor and Mayoress, Councillor and Mrs. F. G. Oliver, at the Museum. Following the reception, Mr. Hubert Bensted, in the Bentlif Art Gallery, read an interesting paper on "Houses of Old Maidstone." On the following day Boxley Abbey was visited, the archæologists being allowed by Mr. R. A. Hamilton Seymour to inspect the discoveries made there quite recently. A vote of thanks having been proposed by Mr. Collyer Fergus to Mr. Seymour for his kindness in allowing the visitors to inspect the Abbey, the party returned to pick up those who came by train, and then proceeded to Sutton Valence, where lunch was provided in a marquee on the Recreation Ground. Sutton Castle, East Sutton House and Church were inspected, and description given of them.—*Kentish Courier.*

WANTED—A TOWN.

BY THE REV. RICHARD FREE.

Five o'clock in the evening, and a fine drizzle falling. Gusty, too ; so that if you are not sufficiently clad you will soon know it in a certain clamminess about knees and elbows. A riverside rain and a riverside wind, penetrating and searching, doing their deadly work very thoroughly. So empty is the street that, were it not for its sudden curve as it follows the course of the river, you could send the proverbial cannon-ball whizzing down the middle of it without hitting a single living thing—provided you shot straight. For, despite the steady drizzle, little children, their hair and clothes wet and lank, are playing at the open doors of the barrack-like dwellings ; a few loiterers hang about the public-houses, waiting for a Heaven-sent drink ; and a knot of women at a corner, bare-headed and eager, are discussing the iniquitous proceedings of the new Board School visitor who has brought them to book in very summary fashion for the truancy of their offspring. Otherwise the street is deserted. No carts, no trolleys, no vans, no drays ! For the day's work is all but over.

Hark ! The silence is broken by the clang of factory bells and steam-whistles, filled with dire suggestions of tolling for the dead and the cry of lost souls over lost opportunities ; and then, into the West Ferry-road, crowding it from end to end, swarms a motley throng of humanity. Do you see these women, with shawls over their heads and whitened hair ? They have been toiling all day in an atmosphere thick with pernicious dust—that is where they got their powdered hair ; and now, having earned the magnificent sum of 1s. 6d. for their long day's work, they are hastening homeward along the curving street. Those boys, black as chimney-sweeps, too tired to give us more than a nod as they pass, are plodding in the opposite direction ; they, too, are homeward bound. The surging mass of factory girls, pale-faced, red-eyed, and bedraggled, yet as good-looking and cheerful as factory girls can be—and that is saying a great deal—have just turned out of yonder huge building in their hundreds ; they are homeward bound also. And the stream of begrimed men, somewhat roughly but withal good-naturedly hustling us as they press on, has only one aim and end—to get home as quickly as possible.

Pleasant pictures come to these hardworking folk as they hurry along ; the kettle singing merrily on the hob ; the good thick hunch of bread (buttered, pocket and larder permitting), the pennyworth of hot fried fish straight from the shop. If any people in this mighty, throbbing, human machine called East London deserve their tea hot, strong, plentiful, and *at once*, surely these brave Millwallers do. Yet few of them will get it for an hour or more. See that girl, the pale thin one, with the old, old face. Sixteen ; not a week older ! She lives a good three miles from here. Her father is a drunkard, her mother an invalid ; she is going to walk every inch of the way home. Look at her shoes. Poor little lass ; there is more bare flesh than leather on the ground, as she trudges through the slush and slime. What a shawl ! She will be soaked to the skin before she is half-way home.

"What does it mean ?" Well, it means that there is nowhere for this girl to live hereabouts ; and her case is but typical of thousands. Go down to Greenwich Ferry any evening about this time, and you will find the boats overloaded with workpeople leaving this district for their homes over the water. Cross the dock bridge, and you will find the little omnibus that plies to and from the West India Dock Station crowded with the few who can afford to ride, the narrow, serpentine street thronged with the many who must needs walk. Our people live anywhere but here where they ought to live—at Stepney, Poplar, Deptford, Greenwich, Canning Town, Silvertown, East and West Ham. Think of the hardship imposed on these poor folk. They must rise at five in the morning to reach their work by six, be an hour late in getting to bed at night after their long tramp, waste shoeleather, enrich the railway companies, add unnecessarily to their physical wear and tear, and run the risk of cold, consumption, and death. Believe me, a night like this sends many a one to his long home.

"And the reason for these people living so far from their work ?" The reason is the strangest, the most incredible. It is not that there is no room for them to live ; there are acres of barren land here, on which could be built pretty, commodious houses (not hideous, uncomfortable flats) capable of accommodating 10,000 people. It is not that there are no builders who will undertake the job ; there are a dozen men in London who would be willing to start to-morrow if they could see their way clear to a fair profit on the transaction. But they cannot ; and that is why they will not build ; and that is why these honest folk are compelled to travel to and from their work by road, by river, by train, and by "shanks' pony." "And why cannot they build ?" Because the price of the land hereabout is prohibitive. Landholders are asking 6,000*l.* an acre on the other side of the island, where land is scarce ; and even here, where it is plentiful, they want an average of 1,250*l.* an acre—not freehold, mind, only a ninety-nine years' lease. Then guess what our rating is in Poplar. Over 9s. in the pound ; the highest, so they say, in the whole of London ! And a more desolate and forsaken place than this—badly lighted, badly scavenged, badly policed—the whole of London could not show. "Slums ?" No, we have no slums. We are a hard-working and law-abiding folk, for the most part ; there are no criminals among us. And that is the shame of it. Perhaps, if we had made London ring with our sins, we should be better looked after ; as it is we are shockingly neglected.

You will see at once how any ordinary building scheme should fail of success under the circumstances ; and so the factory, like the huge greedy monster it is, has it all its own

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way, and, spreading hither and thither, lays waste the homes of the workers. When I first came to this district four years ago, I could not get so much as a single room to live in; and I had to wait for three months before I could secure such a house as the one I now inhabit, which is by no means a palace. The other day a newspaper man came to see me, and he roamed up and down the West Ferry-road for ever so long before he found me. "I kept on looking at this house," he explained, when he was at last seated in my study, "I kept on looking at it, and saying to myself, 'The parson can't live *there*, surely!'"

The house famine is much more acute to-day than it was four years ago. Year by year, almost month by month, the dwellings of the poor are sacrificed to the factory-monster. A row of houses is suddenly doomed, and notice to quit served on the inhabitants; in a few weeks another vacant space is added to the acres of emptiness around; in a few more weeks a huge chimney belches out thick black smoke, shot with tongues of living fire. No effort is made to house the evicted. That is not the business of the up-to-date employer of labour. Women, dragging little children along, tramp the streets for miles; men toss through sleepless nights wondering what is going to become of them; lads and girls are ruthlessly thrown out of good employment because they can find no lodgment near enough to their work. It is a real thing and a terrible, this same house famine. Hereabouts you may walk till you drop, and you will not find so much as a single room "to let." As for houses—but I will give you an instance. There was a house about to be vacated a short time ago, and it got about, as such a rare event always does in this neighbourhood, and long before the tenants were out the agent had fifty-three applications for that house. Yes, the dwellings of the workers are being perpetually sacrificed to the gluttony of the factory, and the workers are being driven farther afield, to their detriment in health and wealth. What is wanted is a philanthropic builder, who will be satisfied with 4 per cent. in money on his outlay and 100 per cent. in the blessings of a host of happy people. For this Isle of Dogs is, without doubt, the healthiest part of the East End, and, for that matter, as healthy as any part of London. "A dreamer?" Well, I suppose I am; and in my dream I see neat artisans' dwellings, where now are dirt and desolation; a playground for the young and a resting-place for the old, where now are heaps of filth and refuse; trees whose growth shall be grateful to weary eyes, where now are miles of unsheltered pavement; electric light, where now are fitful gleams of remote lamps unworthy of the countriest of country towns; clean, well-paved roads, where now are dust in summer, mud in winter, and defilement always; a prosperous town, in short, where now are forlorn streets and wretched houses. That is my dream for Millwall. I wonder whether it will ever come true?

St. Cuthbert's Lodge, Millwall.

COMPETITIONS.

WORKHOUSE, WIGAN.—At a meeting of the Wigan Board of Guardians recently some discussion ensued on the minutes of the Estates Committee, and it was ultimately resolved that the minutes should be confirmed, with the addition that Messrs. Heaton, Ralph, & Heaton, of Wigan, should be put in the list of architects who could compete for the work of making plans and sending in specifications for the new workhouse. The list of architects, as altered, contains the names of Mr. W. Owen, of Nottingham; Mr. Morton; Messrs. Chas. Smith & Sons, of Reading; Mr. Arthur Marshall, of Nottingham; Mr. E. Kirby, of Liverpool; and Messrs. Heaton, Ralph, & Heaton, of Wigan.

STONE WINDOWS.—A Consular Report to hand from Germany mentions that in a new building attached to some boiler works in Upper Silesia a novelty in windows has been tried. Light is introduced through stone windows. The ordinary panes of glass were impracticable on account of the nearness of the works to the railway lines, so pneumatic glass stones have been used instead. From the outside the appearance is the same as the so-called "Butzen" panes. They are translucent, and at the same time as strong as the stone wall in which they are set; they will withstand any pressure or blow that the walls will withstand.

THE CEMENT TRADE.

A REPORT has been received at the Foreign Office from Mr. Pelly, British Vice-Consul at Seattle, Oregon, in which he writes:—"Cement in large quantities has been used in building operations of all kinds. The year 1900 witnessed a large increase of building, and cement was in heavy demand. The great tunnel of the Great Northern Railroad through the Cascade Mountains consumed a large quantity. The cement came largely from Belgium and England. The prospect for the current year is a large demand. The quotation by the jobber to the consumer on imported cement has ruled from 13s. 2½d. to 14s. 5d. per barrel."

Reporting on the commerce, &c., of Portland, Oregon, Mr. Consul Laidlaw says that the cement trade there has largely gone to Germany and Belgium, and this year China and Japan have entered as competitors. Some of the Chinese brands of cement are reported to be of good quality, and well up to the best brands, but the Japanese cement is not favourably reported upon. Writing from Tacoma, in the same State (Oregon), Mr. Vice-Consul Alexander observes that a feature of interest in the statistics is the import of barrels of "Portland" cement manufactured in Hong Kong. The indications are that Hong Kong will make constantly increasing shipments to the Pacific coast of this article, which has been subjected to Government and railway tests with excellent results.

Mr. W. Moore, British Acting-Consul at San Francisco, forwards the following table of the cement imported in his consular district during the last two years:—

	Quantity.	
From	1900. lbs.	1899. lbs.
Belgium	122,182,290	50,234,000
Germany	75,412,551	27,005,200
United Kingdom.	69,442,000	37,541,000
China	2,964,146	—
Japan	981,200	—
Total	270,982,187	123,780,200

Importations (Mr. Moore remarks) were unusually heavy in 1900, the amount received being more than double that of the year preceding. A large and fairly satisfactory business was done for the first six months, but afterwards prices declined owing to the heavy arrivals and the competition of domestic producers. The stock in hand at the close of the year was very large, and, added to that contracted for and on the way, is quite sufficient for a year's requirements. Prices closed irregular, concessions having to be made to induce buyers to transact business. Not many years ago British cement had almost a complete monopoly of this market, but last year the importations fell from second to third place, as may be seen by reference to the table. This state of affairs is attributed to the manufacturers who refused to regard the advice and warnings of importers, who urged them to produce a finer article, which they neglected to do until the Continental makers had firmly established themselves in the business. The British cement now sent here meets the requirements in quality and price as compared with the Continental article, but has lost the prestige that it formerly held, and no longer commands the sale it used to enjoy. The competition that was threatened by the Chinese and Japanese manufacturers did not turn out to be of a serious nature, only a small amount having been received from those countries. These imports are sent here by steamer, while the cement from Europe comes by sailing vessels, and the difference in the cost of transportation is said to offset the advantages they possess in cheapness of production. Competition of a more serious character has arisen through the manufacturers of the State of Utah, who are forwarding consignments to this market on a large scale, and who recently secured a contract of 10,000 bags in competition with the agents of European brands. They have since secured several contracts from the United States naval and military authorities at a price of 2 dols. 35 c. (9s. 8d.) per bag (a bag contains 380 lbs. and is equivalent to the contents of a barrel) laid down where the work is proceeding; and although some prejudice exists against this mode of packing, no serious complaints have arisen. All the cement that came in during the last six months of 1900, and that which has arrived since, shows a serious loss, as with present prices and rates of freight the European article cannot be landed here for less than 2 dols. 60 c. (10s. 8½d.) to 2 dols. 75 c. (11s. 4d.) per barrel. Several local companies for the manufacture of cement have been incorporated, and one of them, possessing extensive properties at the town of Tesla and backed by large capital, is expected to commence operations by the end of the current year. Those that can produce a good article and are situated within a radius of fifty miles from this city have excellent prospects of success, as the transportation charges will not preclude the consignment of their product to this market. Some of the conservative business men here express the opinion that the entire needs of the State will be supplied from local sources in the near future.

In an official Report received from Germany it is announced that the Prussian Minister of Public Works has issued new regulations for the testing of cement. The railway authorities have therefore established a department for that purpose in their technical bureaux. No particular technical knowledge is necessary for the testing operation; only experience is wanted. In cases of dispute the last appeal is to be made to the Royal Mechanical Technical Experiment Institution (Department for Building Materials) at Charlottenburg. The judgment of experts at this institution is always called into requisition when large quantities of cement are delivered for important buildings. The cement trade (adds the Report) has been in a very bad state for some time, owing to over-production and underselling. Since the principal works have formed a trust the outlook has become brighter. The trade would benefit considerably if the great Midland Canal were to be built.

Illustrations.

S. ANDREW, STOKE DAMERALL CHURCH AND RECTORY.

THE rectory shown upon the drawings was erected last year. It is built of the rough local rubble, with rough-cast exterior, rough stone base and chimneys.

The fashion of the place is to neatly cement the houses, and line them out, with the result that the town is quickly acquiring a thoroughly mean and temporary character.

Stoke is the mother parish of Devonport. The old church in its present form is constructed largely of ships' timbers, and has a curiously ramshackle aspect. The tower and one of the porches belong to the early sixteenth century, and have a pleasing but decrepit local character, but there is nothing else of interest save a few architectural fragments.

The graveyard was picturesque, but has recently been spoilt by a Corporation road-widening and a prodigious official wall and railing.

It is proposed—as the church must be rebuilt—to erect the new building upon a fine site adjoining the rectory, some few hundred yards from the old one. The plan has been specially schemed to suit the peculiarities of the new site. It is proposed to use local elvan externally and Beer stone internally, and to give the building a thoroughly west-country character.

The tower of the old church will be preserved.

W. D. C.

NEW PREMISES, COWCROSS STREET.

IN the street front here shown the lower story is of West of England granite, unpolished. The upper portion is of Lawrence's red brick and Bath stone (Monk's Park). The frieze, modelled by Mr. Pomeroy, is to be carved in Portland stone.

The builders are Messrs. Killby & Gayford, and the clerk of works Mr. J. Brady. The electric lifts are by Messrs. Waygood & Co.; the iron and steel work by Messrs. Jones & Co.; the electric light wiring by Messrs. Wenham & Waters; and the fittings of the still house by Messrs. Bennett Shears & Co.

Mr. E. W. Mountford is the architect.

"MUNSTEAD ROUGH," NEAR GODALMING.

THE walls of this house are covered with Portland cement rough-cast, and it is roofed with Westmorland slate. The dining-room is panelled with oak, the hall with some very beautiful English cedar.

The builders were Messrs. Kingerlee & Son, of Oxford. The garden was laid out by Miss Jekyll.

Mr. E. W. Mountford is the architect.

SOME EXAMPLES OF MODERN LEAD-WORK.

ONE of the signs of the increased attention now paid to the artistic treatment of detail is to be noticed in the revival of the old taste for the decorative treatment of leadwork, even when used only for such practical purposes as gutter-heads.

Our sheet of illustrations shows several examples of work of this kind, nearly all designed by architects.

Fig. 1 is a rain-spout head designed by Mr. F. W. Troup and made by him and Mr. Dodds.

Figs. 2, 3, and 5 are rain-spout heads

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designed by Mr. H. Weir Schultz and made by Mr. Dodds.

Fig. 4 shows fret-cut vallances, made at the School of Arts and Crafts at Bethnal Green.

Fig. 7 is a rain-spout head designed by Mr. F. Inigo Thomas and made by Mr. Dodds.

Figs. 6 and 8 are two leaden sun-dial tables designed by Mr. F. W. Troup and made by him and Mr. Dodds.

Correspondence.

To the Editor of THE BUILDER.

PURIFICATION OF SEWAGE.

SIR,—I have been much interested in your leading article of last week on the bacterial purification of sewage.

Eight years have passed since you quoted (August 12, 1893) the evidence given by Professor Sims-Woodhead before the Royal Commission on London Water Supply, when he referred to my early experiments, in which "animal and vegetable substances are rapidly broken down and brought into solution by the peptonising organisms which liquefy gelatine."

Following upon these experiments the further process of nitrification has been carried out so as to obtain 98 per cent. oxidation of the organic nitrogen in sewage. The first result is attained by the inherent putrefactive changes of the sewage itself, and the second change is arrived at by providing *that amount of filtering surface and that amount of air* necessary for the working of the nitrifying organisms which produce final mineralisation of the organic pollution.

When you say in your leading article, "The unsatisfactory nature of the London effluents, both chemically and bacteriologically, is to a large extent due to the faulty method of treatment and to the makeshift apparatus," you state, in general terms, what would have been equally true if you had said the London experiments have not made proper provision for utilising the inherent capacity of sewerage to liquefy its organic solids by a putrefactive change, and have not provided *that amount of filtering surface and that amount of air* which is necessary for the complete mineralisation of the organic pollution of the sewage. You would also have been justified in saying that the London results prove that the professional advisors of the Council do not know what amount of putrefactive change and what amount of filtering surface and air are necessary to purify the London sewage in terms of any given number of gallons per twenty-four hours. Their experiments should have been directed, in the first instance, to the sole object of obtaining this information, and their reports must necessarily be valueless until they possess it. The real difficulty lies in their attempt to arrive at reliable conclusions without having reliable data to go upon.

The apparatus necessary for obtaining reliable data has not been used, and the labour attending upon experiments made with inadequate appliances will be thrown away indefinitely if they continue to go on as they are doing.

It is on the face of it a waste of time and money and intelligence to investigate results obtained from faulty methods of treatment and makeshift apparatus.

I wish other journals and persons equally interested in public health and expenditure would hit the nail on the head as accurately as you have done.

W. D. SCOTT-MONCRIEFF.

WIDENING OF PICCADILLY.

SIR,—It is satisfactory to find that the condemnation of this ill-considered scheme which you and others have expressed seems to be leading to its withdrawal. It does not seem to be realised that the width of Piccadilly has not much to do with the matter. The real difficulty is the too great concentration at Hamilton-place of the north and south traffic where it crosses the east and west. Park-lane is practically the only north and south thoroughfare for ordinary traffic for a mile and a-half—that is between Berkeley-street and Exhibition-road, and it appears to me that the only real remedy will be to take some liberty with the parks. For instance, why should not cab traffic be allowed to enter the park at Hyde Park Corner and pass out at Marble Arch? Or what a corner would be cut off if cab traffic were admitted at Albert Gate and taken by a new road to join the park road already named at Grosvenor Gate? It would perhaps be a pity to cut through this part of the park, but it seems to have become a necessity.

W. NIVEN

BUILDING LAW.

SIR,—Those who know anything of this subject will fully endorse the strictures of "Experientia" on the matter in your last issue, and the writer of this note (who had to criticise the new Bill before it became the Act of 1894) knows not only that "too many cooks" are permitted to take part in its preparation, but that many of them are as unfit for the operation as the writer would be in the position of Lord Chancellor. Hence the "perfect maze of building law" to which your correspondent so cogently refers. But the practical question is, will it ever be otherwise under existing conditions? I trow not.

PRACTICAL.

PORTLAND CEMENT TESTING.

SIR,—Referring to Mr. Reed's second letter, in your last issue, on the matter of Portland cement testing, I thoroughly appreciate his criticism, as it has been most fair, and it appears to me that there is now no difference of opinion between us.

THE WRITER OF THE ARTICLE.

The Student's Column.

GAS AND GAS FITTINGS.

7.—BY-PRODUCTS AND THEIR USES.

THE residuals obtained in the manufacture and purification of coal gas and the articles of commerce made therefrom, are too numerous to be even enumerated here. The manufacture of coal tar products is of itself an industry of the first importance. The aniline colours, creosote, carbolic acid, pitch, coke, sulphate of ammonia, and nitrobenzene are among the products derived directly or indirectly from coal.

At the Beckton Gasworks, London, which are the most extensive in the world, tar distillation is carried on and many by-products are manufactured, but in most cases the tar is sold by the gas manufacturer to the manufacturer of chemicals or dyes. The principal products other than gas commonly sent out from a gasworks are coke, tar, sulphate of ammonia, spent oxide, and spent lime.

Coke.—Gas coke should consist almost wholly of carbon. It should never contain more than 5 per cent. of water nor yield more than 8 per cent. of ash. The amount of sulphur should not exceed 1 per cent. The statement that gas coke contains much more sulphur than household coal is, generally speaking, altogether erroneous. The coke as it leaves the retort is in pieces of too large a size to be convenient for domestic use, but it can now be obtained from the works broken to convenient size, and consequently finds a more ready sale for domestic purposes.

Tar.—About 10 gals. of tar are commonly obtained per ton of coal carbonised. The tar from Durham coal has usually a specific gravity of about 1·200. Butterfield gives the following as the results of an assay of a typical London coal tar :—

	Per cent. by weight.	Remarks.
Specific gravity at 15·5 deg. C = 1·192.		
Aqueous ammoniacal liquor	3·53	
Light oils (distilling over below 170 C)	1·99	Lighter than water. Include benzol, which is used for the manufacture of aniline.
Middle oils (distilling over between 170 and 270 C)	18·46	Include napthalene and carbolic acid.
Anthracene oils (distilling over above 270 C)	12·20	From which alizarin is manufactured.
Pitch (medium)	59·20	Used for paving, roofing, varnishes, patent fuel, &c.
Loss on distillation	4·62	
	100·00	

Tar Concrete and Tar Pavement.—Tar concrete is made of broken stones or shingle thoroughly mixed with tar, about twelve gallons of tar being used for every cubic yard of concrete. The tar should be heated and the solid matter dried before the two are mixed. Breeze, furnace cinders, broken clinker, and other materials are also often employed for mixing with the tar. For tar pavement Newbigging recommends the following treatment:—The solid ingredients are divided into three grades—1. Coarse material which will not pass through a sieve having bars ¾ in. apart; 2. Riddlings which will pass this screen, but will not pass through a ⅜ in. sieve; and 3. Fine material which passes through both sieves. The three grades are made hot and mixed with hot tar in the following proportions :—

1. Coarse material ..	1 part tar, 9 parts solid	or 24 gals. tar to 1 ton solid.
2. Riddlings.....	1 part tar, 7 parts solid	or 30 gals. tar to 1 ton solid.
3. Fine material	1 part tar, 6 parts solid	or 36 gals. tar to 1 ton solid.

The footpath having been curbed, the upper edge of the kerb standing 3 in. above the solid bottom of the path, the coarse mixture is laid down 2 in. thick; then the medium mixture is laid ⅝ in. thick; and, finally, on top of this the finest material is laid about ⅜ in. thick. Each layer is rolled with a 10 cwt. roller before being covered with the succeeding layer. The surface of the pavement may be sprinkled with powdered Derbyshire spar or granite to improve its appearance.

Tar for making pavement should, according to O'Connor, be heated until converted into pitch that will harden on cooling; but if overheated the tar will lose its tenacity and produce a pavement which will disintegrate rapidly. The tar should be heated in open boilers, at about 194 deg. Fahr., for from four to twelve hours.

Tar as a Paint for Iron.—Coal-tar contains substances of an acid nature, and these should be removed before the tar is used as a preservative paint for iron. When tar is distilled a neutral, solid, resinous pitch is obtained as a residue, and this pitch, when dissolved in benzene or petroleum, makes a better paint for iron than raw coal-tar. It should be applied while hot. Coal-tar or coal-tar pitch should not be used on iron exposed to the direct heat of the sun's rays, for tar paints so heated are liable to soften and run. Tar paints are valuable for painting pipes to be laid under ground and for sheet-iron flues. Tar is also suitable for protecting iron rivets and nuts. Tar in its raw condition always contains more or less water mixed with it, and this should be carefully removed before it is used as a paint.

Spent Oxide.—Spent oxide of iron, when discarded for further use in the purifiers, should contain not less than 50 per cent. of free sulphur. In large works this is sometimes converted into sulphuric acid to be used on the works for the manufacture of sulphate of ammonia, but the spent oxide produced in smaller works is usually sold to sulphuric acid manufacturers.

Gas Lime.—The lime used for gas purification should be flare lime, and as pure as possible. A good building lime would not be suitable for gas purification, for the power of "setting" indicative of a good building lime s a feature to be avoided in lime required for gas purifiers, and the impurities which often increase the value of the lime for building purposes always depreciate its value as a purifier. When the lime in the purifiers has become "spent" it is thrown out and exposed to the atmosphere for as long a period as possible, unless it is to be re-burnt to quicklime on the works. Exposure to the air causes oxidation of some of the unstable constituents, and diminishes the intensity of the odour evolved by the lime.

In large towns the gas manufacturer usually has to pay for the removal of the spent lime, but in country towns the farmers buy it for a small sum for agricultural purposes. Gas lime improves soils of a certain class, and checks certain plant diseases, but it should never be used until it has been exposed to the air for a long period. Dr. Voelker gives the following as the composition of gas lime which has been exposed to the atmosphere for a sufficiently long period to render it a safe manure :—

Composition of Gas Lime (Dried at 212 deg. F.)

	Per cent.
Water of combination and a little organic matter	7·24
Oxides of iron and alumina, with traces of phosphoric acid	2·49
Sulphate of lime	4·64
Sulphite of lime	15·19
Carbonate of lime	49·40
Caustic lime	18·23
Magnesia and alkalies	2·53
Insoluble silicious matter	·28
	100·00

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Sulphate of Ammonia. — The ammoniacal liquor from the hydraulic main, condensers, washers, and scrubbers is collected in a well or tank, and subsequently used in the manufacture of sulphate of ammonia. The sulphate is principally used for agricultural purposes as a nitrogenous manure.

When the ammoniacal liquor is boiled, the carbonate and sulphide of ammonia it contains are decomposed and free ammonia is liberated. The ammonia, together with steam and other gases, passes forward to a baffle box, where the excessive moisture is removed, and from thence it passes to a vessel termed the "saturator," which contains diluted sulphuric acid, and in which solid sulphate of ammonia in the form of minute crystals is precipitated as the acid becomes saturated with ammonia. The sulphate is fished out with a perforated ladle and placed on a draining table. A small proportion of the ammonia in the ammoniacal liquor is present as chloride, sulphate, and other compounds of ammonia which are not decomposed when the liquor is boiled; the residual liquor remaining after the "free ammonia" has been removed by boiling is therefore heated with lime, which causes the "fixed" ammonia to be liberated, and renders it available for conversion into sulphate of ammonia.

A sample of ammoniacal gas liquor (sp. gr. 1·0207 at 22 deg. C.) examined by S. Dyson had the following composition :—

	Grammes per Litre.
Ammonium sulphide	3·03
„ carbonate	39·16
„ chloride	14·23
„ thio-cyanate	1·80
„ sulphate	0·19
„ thio-sulphate	2·80
„ ferro-cyanide	0·41

Prussian Blue.—Compounds of hydrocyanic acid (prussic acid) are present in small quantities in the unpurified coal gas as it leaves the retorts. These compounds are termed cyanides (ammonium cyanide and sulphocyanide), and several processes have been devised to recover the cyanogen in the form of sodium or potassium ferrocyanide for subsequent conversion into the cyanide of iron ($Fe_7\ Cy_{18}$) known as Prussian blue. The manufacture of Prussian blue is, however, carried on at very few gasworks in this country, and very few details relating to the method of manufacture, and the economy effected, have yet been published; and it is said that the Prussian blue obtained is not so pure as that manufactured from other sources. Prussian blue is always present in more or less quantity in oxide of iron which has been used for purifying the gas from sulphuretted hydrogen.

Bisulphide of Carbon.—Liquid carbon bisulphide has been recovered on a comparatively large scale by H. Leicester Greville from the spent lime discharged from the purifiers used for removing this impurity from the gas. The liquid bisulphide may be obtained by simple distillation of the spent lime with water. It was found that the lime would yield about 1½ per cent. by weight of liquid bisulphide, and that the residue left in the boiler contained 50 per cent. of free lime, and could be again used for purification purposes. It was proposed to use the liquid bisulphide for dissolving the free sulphur from the spent oxide of iron produced on the works, the sulphur and bisulphide of carbon being subsequently separated by distillation, and the oxide of iron, after removal of the sulphur, being again used for gas purification. The scheme has not, however, been adopted, as it has been found more economical to burn the sulphur contained in the spent oxide into gaseous sulphur dioxide, and to subsequently convert it into sulphuric acid.

BOOKS RECEIVED.

Botticelli. By Ernst Steinmann. Translated by Campbell Dodgson. (H. Grevel & Co.)

Mr. Alfred Waterhouse.—The condition of Mr. Alfred Waterhouse, R.A., who is suffering from indisposition at his residence in Berkshire, is, it is stated, happily not serious.

Street Improvements, Maidstone.—At the Town Hall, Maidstone, recently, Mr. W. A. Ducat, Local Government Board Inspector, held an inquiry respecting an application by the Urban District Council for a loan of 6,500*l.* for the purpose of street improvements in Mill-street. Mr. Bunting, Surveyor, explained the plan of the proposed improvements.

GENERAL BUILDING NEWS.

School Extension, Worsley Mesnes, Lancashire.—The foundation-stone of a new infant school, in connexion with St. James's Church, Worsley Mesnes, was laid recently. The new school is being erected at a cost of about 1,500*l.* Messrs. Heaton, Ralph, & Heaton, of Wigan, are the architects of the new building, while Messrs. Hilton & Ince, of Ashton-in-Makerfield, are the builders.

Baptist Church Schools, Sheffield.—Extensions to the schools in connexion with Cemetery-road Baptist Church, Sheffield, have just been completed. The extensions are situated between the back of the church and Napier-street. There is a schoolroom, 58 ft. in length and 20 ft. across, which will principally be used as an assembly-room. There is a gallery at the back In order to bring the building into line with the street, advantage has been taken of a narrow strip of space to provide an ante-room. On the ground-floor there are also a room which will be used for young men's classes, and an infants' room. Upstairs there is a room for ladies, and the minister's vestry has been doubled in size. The old schoolroom is to be partitioned into eight class-rooms. Electric light has been provided throughout. The architect was Mr. J. Amory Teather.

Schools, Writhlington, Somersetshire.—New voluntary schools have been erected in Green Parlour-road, for the education of the children of Writhlington and Foxcote. Mr. W. J. Willcox, of Bath, was the architect, and the contract was secured by Mr. Joseph Bird, of Radstock. The new premises are built for a mixed school, and will accommodate 118 children. The building contains one large room, 57 ft. by 20 ft. There is also one classroom for thirty children, and a room for the use of the teachers. Each room opens out on to hat and cloak lobbies, one for girls and infants and the other for boys, and each contains a lavatory basin The heating is by the ordinary open fire grates. The building, which has cost about 1,200*l.*, is erected with native white lias stone with Bath stone dressings, the roof being covered with red Bridgewater tiles.

New Godstowe School, Wycombe.—The foundation-stone has just been laid of a new preparatory school at Wycombe. The new building is intended to be a boarding-house for girls, and hereafter it is proposed to erect separate school buildings in the grounds, which cover an area of five acres. The site is situated on the brow of the Amersham Hill. The house will contain for the use of the girls a dining-room, a study, and a playroom. The dormitories are to be arranged on the cubicle principle, and bathrooms, &c., will be provided in connexion therewith. From the summit to the base of the building there is to be a fireproof staircase in addition to the ordinary staircase. Externally, the building will be faced with red bricks up to the first floor, and above that the walls are to be covered with rough cast. A tiled roof will be provided. The plans for the construction of the buildings have been prepared by Mr. W. Gillbee Scott, of London, and the contract has been let to Messrs. Colls & Sons, of London.

School, Ewood, Blackburn. — The corner-stone of a new school extension at St. Bartholomew's, Ewood, Blackburn, was laid recently. The new school is expected to provide accommodation for 130 additional scholars. The architects are Messrs. Cheers & Smith, and Mr. John Boland, of Blackburn, is the builder.

School, Busby, Lanarkshire —The School Board of Busby have decided to rebuild the school recently burned. and, as the result of a competition, Messrs. Watson & Salmond's plans have been accepted by the Board. The school provides accommodation for 450 scholars, with a central hall, round which are grouped the classrooms.

New Grammar School, Lichfield. — The foundation-stone was laid on July 20 of the new buildings to be erected, at a total estimated cost of 9,000*l.*, on Borrowcop-hill, Lichfield, after designs and plans made by Mr. T. Hillier-Pyke. The new buildings, which, it is hoped, will be enlarged hereafter, will provide, at present, for 125 boys and twenty-two resident scholars, and include residences for the head and assistant masters. The local Conduit Lands Trust contribute 4,500*l.*, and the site extends over eight acres. It is stated that the Staffordshire County Council intend to make a grant in aid of the establishment of the scientifical and technical departments of the foundation. A contract-tender of 7,082*l.* has been accepted from Messrs. Ward & Son, of Uttoxeter, subject to approval of the Charity Commissioners and modification.

Home for Sick Children, Naunton Park, Gloucestershire.—New premises for the Home for Sick Children are being built on a site at Battledown. It is intended to erect a building which, in addition to an administrative block, laundry, &c., will include two long wards capable of accommodating twenty-four children. The buildings will be of brick, the lower story pebble-dashed, the upper story of red hanging tiles; and there will be large verandahs running round the wards for the use of the young patients. Messrs. Prothero & Phillott are the architects, and the building contract has been entrusted to Messrs. Collins & Godfrey.

Workhouse, Wednesfield.—A new workhouse, situated at New Cross, Wednesfield, is being erected for the Wolverhampton Board of Guardians. Mr. A. Marshall, of Nottingham, is the architect, and Mr. Smyth is the clerk of the works. The total area of the sites is 50½ acres, about 40 acres being utilised as airing grounds or for cultivation. The cost of the land was 11,128*l.*, while the contract for the buildings was placed with Messrs. Fish & Sons, of Nottingham, whose tender for the whole of the work reached 156,879*l.* The latter sum, however, is not inclusive of the cost of furniture, roadmaking, and the cost of the greater part of the boundary walls. Provision will be made for 1,142 officials and inmates, the former numbering sixty. The main buildings are set back from the road and parallel to it, in the centre of which will be found the administrative offices, dining-hall, stores, &c., and a little in the rear the engine-house, laundry, workshops, &c. The infirmary pavilions are some distance in the rear of the main building, while provision for a resident medical officer is to be found in the centre. The pavilions are connected on the ground floor by enclosed corridors, the roofs of which provide means of communication between the upper wards. Contiguous to the infirmary pavilion on the right is the nurses' home, which will contain messroom, sitting-rooms, library, &c., on the ground floor, and twenty bedrooms. An isolation hospital to accommodate two males and two females, and rooms for a nurse are placed near the boundary of the site on the right and furthest from the road.

Liberal Club, Neston, Lancashire.—The foundation stone of the Neston Liberal Club was laid recently. The club includes an entrance porch and vestibule facing the main road, together with a secretary's office. Provision is being made in the vestibule for the storage of bicycles. To the right of the entrance are a cloakroom, lavatories, and staircase to the gallery. On the left is the dining-room. The large hall, which is on the ground floor, is about 80 ft. long and 40 ft. wide, with a stage at the rear. On the left of this hall is the billiard-room, which can be so arranged as to form part of the main hall. A kitchen, with cooking ranges, is also being provided. At the rear of the building is the bowling club committee-room, ante-room, lavatory, cloak-room, and four bath-rooms. A verandah, 80 ft. long, runs down the western side of the building, overlooking the bowling green. The large hall and gallery will probably accommodate between 600 and 700 people. The structure is being made of bricks, with green slate roof. Mr. T. T. Rees is the architect, and Mr. J. Evans is the builder.

Hospital, Newport, Mon.—The new Newport and Monmouthshire Hospital, which has been built on a plot of land of about 4½ acres (given by Lord Tredegar), abutting on the Cardiff-road at Newport, was opened on the 5th inst. The new hospital has been erected on the pavilion principle—with central administrative block and pavilions stretching out on both sides at right angles. The building is Renaissance in style, and is faced with deep red bricks. The window dressings and horizontal bands are of Bath stone. Accommodation is provided for eighty-four patients, as follows :—A medical ward for twelve males, a similar ward for twelve females, two surgical wards for twelve males each, a surgical ward for twelve females, and a children's ward for twelve patients. Accommodation is also provided for twelve beds for isolation cases. The building was erected by Messrs. A. S. Morgan & Co., from designs by Mr. R. J. Lovell, of London. The plumbing and sanitary apparatus, electric light installation, electric bells, &c., were fitted by Messrs. R. Alger & Sons, Newport. The arrangements for the electric lighting were carried out under the direction of Messrs. Wallace-Jones & Dent, consulting engineers, Westminster.

Dobbie Hall, Larbert, Stirling.—The new hall at Larbert, built and presented to the district by Major Dobbie, was opened on the 5th inst. by the Duchess of Montrose. The building comprises both a large and a small hall. The latter is to the front, and has accommodation for about 200 persons. The main hall, which is lighted by ten large windows, accommodates 700 persons below and 300 persons in the gallery which runs round three sides of the building. There is a wide recessed platform at the end, framed in by an ornamental archway and flanking pillars. Adjoining the platform are retiring-rooms and other accommodation. To the right of the main entrance of the building there are also cloakrooms, ladies' retiring-rooms, and a kitchen with a lift to the service-room on the floor above. The architects were Messrs. A. & W. Black, Falkirk.

SANITARY AND ENGINEERING NEWS.

Sewage Disposal, Clay Cross.—The Clay Cross Urban District Council have accepted a scheme of sewage disposal for their Urban District prepared by Mr. Harry W. Taylor, A.M.Inst.C.E., of Newcastle-on-Tyne and Birmingham. The sewage will be treated bacterially, the cost being 6,000*l.*

Bridge, Newcastle.—A new steel bridge over the Tyne, between Newcastle and Gateshead, which has been completed at a cost of 80,000*l.*, was opened on Tuesday. The bridge has been built on

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the exact site of the bridge that existed there previously, and traffic has been carried on uninterruptedly during its construction. The new structure was built round about the old bridge, which was removed piecemeal. The engineers were Messrs. Sandeman & Moncrieff, Newcastle, and the contractors were Messrs. William Arrol & Co., Glasgow.

LINCOLN WATER SUPPLY.—The Corporation of Lincoln, having been advised by geologists as to the feasibility of obtaining an additional supply of water from the New Red Sandstone, consulted Mr. Percy Griffith, Assoc.M.Inst.C.E., F.G.S., of Westminster. Specifications having been prepared, tenders were invited for a boring 2,176 ft. deep, lined with 30-in. tubes for a depth of 400 ft., and terminating not less than 12 in. diameter. Seven tenders were received for the work, and the Corporation, on the advice of their engineer, have now accepted that of Messrs. Charles Chapman & Sons, Limited, of Salford, amounting to 14,605*l.* The time allowed for the completion of the work is four years. The following is a list of the tenders received:—Thomas Matthews, Pendleton, 21,645*l.*; W. Hill & Co., Westminster, 19,630*l.*; Vivians Boring, &c., Company, Limited, Whitehaven, 18,471*l.*; British American Well Works, London, 18,000*l.*; Stourbridge Well Boring Company, Stourbridge, 17,947*l.*; Charles Chapman & Sons, Limited, Salford (accepted), 14,605*l.*; John Thom, Patricroft, 11,970*l.*

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. W. C. Banks & Son, architects, have removed their City offices from 39A, Gracechurch-street to 5, Adelaide-place, London Bridge, E.C.——Messrs. Harris & Wardrop, builders and contractors, of 10 to 14, Wallwood-street, Limehouse, E., have taken into partnership Mr. Clarence Gregory and Mr. James Wolfe King, who have assisted them for many years in the management of their business.

THE HOUSING QUESTION IN LIVERPOOL.—Dr. F. W. Hope, the medical officer of the city, has made in the following terms a representation to the Housing Committee of the Corporation concerning the buildings in the Hornby-street and Upper Mann-street areas:—"In my opinion, within these areas there are certain houses, courts, and alleys which are unfit for human habitation, and that the narrowness, closeness, and bad arrangements and bad condition of the streets and houses, and groups of houses, within such areas, and the want of light, air, ventilation, and proper conveniences, and other sanitary defects, or one or more of such causes, are dangerous or injurious to the health of the inhabitants, either of the buildings in the said areas, or of the neighbouring buildings, and that the evils connected with such houses, courts, and alleys, and the sanitary defects in such areas, cannot be effectually remedied otherwise than by an improvement scheme for the rearrangement and reconstruction of the streets and houses within such areas, or of some of such streets and houses." The Committee have adopted the appended resolutions:—"That it be recommended to the Council that, having taken into consideration the official representation of the medical officer of health, dated July 19, 1901, and being satisfied with the truth thereof and of the sufficiency of their resources, the two areas described in such representation are hereby respectively declared to be unhealthy areas, and that an improvement scheme be made in respect of such areas." "That the Town Clerk be instructed to prepare a draft scheme and take all other requisite steps to carry the same into effect under and in accordance with the provisions of the Housing of the Working Classes Act, 1890, and that the surveyor prepare the necessary plans, particulars, and estimates." Other recommendations of the Committee are as follow:—"That the tender of Mr. William Hall, 60, Christian-street, Liverpool, for the erection of labourers' dwellings in Newsham-street, Kew-street, and Arley-street, for the sum of 20,689*l.*, be accepted." "That the members appointed by the resolution of the Housing Committee of July 19, 1901 (in addition to the Chairman and Deputy-Chairman), to visit various towns which have carried out schemes under the Housing of the Working Classes Act, 1890, visit London and Plymouth, that six other members be appointed to visit Manchester and Salford, and that six other members be appointed to visit Glasgow, and that the resolution of the Housing Committee of June 21, 1901, confirmed by the Council on July 3, 1901, be varied accordingly."—*Liverpool Mercury.*

THE STRAND IMPROVEMENTS.—On the 7th inst. at the Guildhall, Westminster, Mr. John Troutbeck, sitting as High Bailiff, and a special jury had before them the case of Diprose *v.* the London County Council, which was a claim for compensation for the compulsory acquisition of the claimant's premises in New Church-court and White Hart-street, W.C., for the purposes of the Strand improvement scheme. Mr. Edward Boyle, K.C., appeared for the claimant, a printer and bookbinder, and Sir Edward Clarke, K.C., and Mr. Edward Morten represented the London County Council. Mr. Boyle said the case was a very important one, involving as it did the total annihilation of his client's business. It had been agreed between the parties that the average net profits amounted to 1,119*l.* per annum. Under the name of Diprose Brothers his client had been in business for a great number of years. In round figures they were claiming 17,700*l.*—Mr. Howard Martin, surveyor, of Chancery-lane, said the freehold premises were worth at least 16,654*l.* From the average net profit of 1,119*l.* they had to deduct the rent, which left a clear profit of 500*l.* Putting that at two years' purchase it would bring the total amount of the claim up to 17,712*l.*, exclusive of the value of the fixtures and machinery, with regard to which the agreed price had been fixed at 3,000*l.* Mr. Pilditch, surveyor to Lord Salisbury and the Duke of Bedford, and Mr. James Green, of Chancery-lane, supported Mr. Martin's figures, and the claimant's case closed. Several surveyors, including Mr. Farmer (Debenham, Tewson and Farmer), Mr. Samuel Walker, of Moorgate-street, and Mr. Herbert Furber, of Warwick-court, Gray's-inn, estimated the total value of the claimant's property at 14,270*l.* The jury, after some deliberation, awarded the claimant 16,700*l.*, including the 3,000*l.* agreed upon for the machinery, &c.

BUILDING IN CHRISTIANIA (according to a report dated last month, from Mr. Dundas, British Consul-General in Norway) has suffered a check, and the same stagnation has shown itself in the building trade as in the property market, only that it is, if anything, rather more marked. In the first half of 1900, 156 larger and 248 lesser buildings were reported as begun; during the latter half, 130 larger and 217 lesser, or a total for the year of 286 larger and 465 lesser buildings. The majority of these were dwelling houses. The building speculation set in in 1896, when 1,093 buildings of all descriptions were begun, and it attained its maximum in 1898 with 1,605. In 1899, it dropped to 1,398, and last year had fallen to 751—a relapse in two years to what Christiania was building in 1893. The decline of building has been followed by some decline in rents, which had risen considerably of late years.

NORTH LONDON HOSPITAL FOR CONSUMPTION.—An anonymous donor has contributed a sum of money to the funds of the hospital for the erection of a country branch and convalescent home for 100 beds to which patients can be transferred for "open air" treatment from the hospital at Mount Vernon, Hampstead. The same donor has also undertaken to endow that branch with an income of 1,000*l.* per annum; thus his gift exceeds a capital sum of 100,000*l.* The Committee of Management have accordingly agreed to purchase for the new buildings a site of 60 acres lying upon sand and gravel at an altitude of about 350 ft. on the borders of Hertfordshire. The hospital buildings at Mount Vernon were begun in 1880 after Professor Roger Smith's plans and designs, which were chosen by the Committee in competition. The western block was then erected. In 1892-3 was added the central block for thirty additional patients, by Messrs. L. H. & R. Roberts, from designs prepared by Messrs. Roger Smith, Son, & Gale (since Roger Smith & Son), and illustrated in the *Builder* of December 31, 1892. The later extension comprises the chapel, dispensary, out-patients' department, two ward-floors, and an attic floor for the kitchens and rooms for the nurses and servants.

KING'S COLLEGE, LONDON.—The following is the list of the successful students in the Division of Architecture at this college:—*Architectural History* (third year): Silver Medal and Prize of 2*l.* in books, Mr. S. C. Ramsey. *Architectural Studio*: Silver Medal and Prize of 2*l.* in books, Mr. S. C. Ramsey; Bronze Medal and Prize of 1*l.* in books, Mr. G. W. Rogers; Bronze Medal and Prize of 1*l.* in books, Mr. L. K. Wright. *Architecture and Building Construction*: Silver Medal and Prize of 2*l.* in books (second year), Mr. A. H. Bristow; Bronze Medal and Prize of 1*l.* in books (second year), Mr. T. H. Vitty; Silver Medal and Prize of 2*l.* in books (first year), Mr. F. R. Fairmaner; Bronze Medal and Prize of 1*l.* in books (first year), Mr. S. C. Ramsey. *Architectural History*: the Professor's Prize for Best Note Books (third year), Mr. G. W. Rogers. *Building Construction*: the Professor's Prizes for Best Note Books (second year), Mr. L. Baldasano-y-Lopez; (first year), Mr. José P. Katigbak and Mr. Alfredo Rodriquez. *Certificates*: *Building Construction* (second year), W. J. Marlow*; O. C. Thompson*; A. H. Imbert† and E. A. Soames†; J. Gardner† and E. Karam†; E. Woodward†; R. M. Smith†; G. P. Geen† and H. Osmond†; H. C. Swaynet†; (first year), R. V. Gregory*; T. J. R. Kiernan*; J. H. P. Bilbrough†; G. H. Rutland†; G. W. N. Rose†; J. P. Katigbak†. *Architectural History*: G. W. Rogers.†

SOCIETY OF ARTS.—At the last meeting of the Council the following were appointed to form the Applied Art Section Committee for the ensuing year:—Sir William Henry Preece, K.C.B. (Chairman of the Council); Sir George Birdwood, K.C.I.E. (Chairman of the Committee); Thomas Armstrong, C.B.; Professor A. H. Church, F.R.S.; Caspar Purdon Clarke, C.I.E.; Alan S. Cole; Sidney Colvin, M.A.; Walter Crane; Lewis Foreman Day; I. Hunter Donaldson; Major-General Sir John F. D. Donnelly, K.C.B.; Arthur Evans, F.R.S.; Sir John Evans, K.C.B.; Hon. Sir Charles W. Fremantle, K.C.B.; J. Starkie Gardner; William Gowland, F.S.A.; Arthur Lasenby Liberty; Sir Villiers Lister, K.C.M.G.; T. Buxton Morrish; J. Hungerford Pollen; Sir Edward J. Poynter, P.R.A.; Sir Walter S. Prideaux; Sir W. C. Roberts-Austen, K.C.B., F.R.S.; Alexander Siemens; A. B. Skinner, B.A., F.S.A.; John Sparkes; R. Phené Spiers, F.S.A.; Hugh Stannus, F.R.I.B.A.; H. H. Statham, F.R.I.B.A.; Joseph William Swan, M.A., F.R.S.; Carmichael Thomas; John I. Thornycroft, F.R.S.; Sir Thomas Wardle; Henry B. Wheatley, F.S.A. (Secretary).

PROPOSED MUNICIPAL LODGING-HOUSE, SHEFFIELD.—The Sheffield Health Committee recommended the City Council at the meeting on Wednesday to proceed with the erection of a municipal lodging-house on the Crofts area, at an estimated cost of 27,000*l.* In a Report on the matter, prepared jointly by the City Surveyor and the Medical Officer of Health, it was stated that there are forty common lodging-houses in Sheffield. The plans of the City Surveyor (Mr. Wike) are for a lodging-house with 374 beds.

BRADFORD CORPORATION AND THE BUILDING TRADE DEADLOCK.—A deputation from the master builders of Bradford interested in the local dispute in the building trade had an interview on the 8th inst. with the Finance and General Purposes Committee of the Bradford Corporation. The workmen have already had interviews with the Committee. It was pointed out that the men had refused to agree to arbitration. The Town Clerk ruled that it would be illegal for the Committee to take any action in the matter. The position is therefore unchanged. At Tuesday's meeting of the Bradford City Council Mr. E. J. Smith moved the following resolution arising out of the dispute:—"That the resolution passed by the Council on December 13, 1898, with reference to the insertion in Corporation contracts of provisions as to the minimum standard rate of wages be rescinded, and that in lieu thereof provisions to the following effect be inserted in all future contracts:—Contractors shall undertake that in carrying out their contracts they will pay the rate of wages and observe the hours of labour recognised between the respective trades-unions and employers as current for the time being in the locality in which the work to which the contracts relate is to be performed. Contractors will also be required to give an assurance that for three months preceding the date of their tenders they have paid to their workpeople not less than the recognised rates of wages and have observed the recognised hours of labour. They must undertake that in the event of their giving false assurances they shall pay as damages to the Corporation a sum equal to 5 per cent. on the whole of the work completed at the date when such false assurance was made."

CAPITAL AND LABOUR.

BUILDERS' LABOURERS, SWANSEA.—The strike of Swansea builders' labourers, which has lasted fifteen weeks, ended on Saturday last, the men agreeing to return to work at the old rate of wages, viz., labourers 5½*d.* per hour, and scaffolders 6*d.* per hour.

NORTH DERBYSHIRE STONE TRADE.—It is stated that the North Derbyshire stone trade strike has practically ended in favour of the masters. After twelve weeks' stoppage the men are resuming work. The fight has cost the union 1,200*l.* in strike pay, and the loss to the eight firms concerned is estimated approximately at 2,000*l.* The strike was for an advance of 1*d.* an hour.

LEGAL.

RIVAL AUTHORS OF TIMBER CALCULATORS IN LITIGATION.

THE case of Greenwood *v.* Barker came before Mr. Justice Farwell in the Chancery Division on the 8th inst. It was an action by Mr. J. H. Greenwood, who claimed to be the author and registered proprietor of a pamphlet entitled "Calculator of Prices of Small-sized Timber," and also of a book called "Greenwood's Timber Calculator"; also "How to Check a Timber Merchant's Invoice," "The Inch by Inch Method," &c. The defendant, Mr. J. R. Barker, recently published a book called "The Timber Merchants', Builders', and Contractors' Calculator," and the plaintiff claimed an injunction to prevent the defendant from the alleged infringement of his copyright. The defendant denied that he had infringed the plaintiff's copyright, and alleged that he had written and compiled his book independently and without any improper use of the defendant's works.

In the result his Lordship dismissed the plaintiff's action with costs.

IMPORTANT POINT UNDER THE PUBLIC HEALTH ACT, 1875.

THE case of King's College, Cambridge, *v.* the Uxbridge Rural District Council came before Mr. Justice Byrne in the Chancery Division on the 8th inst., on an application by the plaintiffs as Lords of the Manor of Ruislip, and of a Mr. Deane,

* Certificate of Distinction. † Certificate of Merit.

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an adjoining owner, to restrain the defendants from proceeding with the pumping station now being erected by them upon a strip of unenclosed land in the parish of Ruislip, on the north side of the high road from Uxbridge to London, belonging to the plaintiffs, and from otherwise trespassing on the said strip of land.

It seemed that the defendants intended to carry out a scheme for the disposal of the sewage of the parish of Ruislip, which included the town of Northwood, the hamlet of Eastcote, and the village of Ruislip, by which the sewage of the whole parish was to be conveyed to one common outfall for treatment. The sewage of Eastcote, owing to the levels, had to be lifted in order to convey it to the outfall site, and then pumped along a rising main from Eastcote to Ruislip, and for this a pumping station near the spot in question was necessary. The defendants alleged that the strip of land was part of the highway, but the plaintiffs claimed it, and considered that the proposed erection was calculated seriously to damage the adjoining land, which was now developing for building purposes, and the present action was commenced in order to stop the defendants going on with their works.

The defendants alleged that the pumping station was essentially a part of the sewage system of the district, as without some such means it was impossible for the present system of sewerage to deliver the Eastcote sewage on to the outfall site. They further alleged that at the utmost it was only a question of compensation for any damage done and not a case for an injunction.

At the conclusion of the arguments of counsel his lordship, in giving judgment, said that, in his opinion the strip of land in question belonged either to the lords of the manor or to the adjoining owner, and for the purposes of the present application it did not matter to which, as both were joined as co-plaintiffs. The question to be decided was whether the defendants had any right, without giving any notice to the plaintiffs, to go on the land for the purpose of erecting the pumping station. His lordship thought they had no such right. A Local Authority had no right under the Public Health Act to carry a sewer under private property without notice. The further point was raised as to whether the pumping-station was a "sewer" at all within Section 16 of the Act. He did not think that a large building like this pumping-station was part of a sewer, but he did think that it came within Section 27 and was an apparatus "for the distributing or otherwise disposing of sewage" for which land could and would have to be purchased. For these reasons he thought that the plaintiffs were entitled to an *interim* injunction to restrain defendants from entering upon or taking the land in question otherwise than in accordance with their statutory powers not being powers under Section 16 of the Act.

Judgment accordingly.

Mr. Norton, K.C., and Mr. R. J. Parker appeared as counsel for the plaintiffs; and Mr. Levett, K.C., and Mr. Lushington for the defendants.

CASE UNDER THE LONDON BUILDING ACT, 1894:

THE DISTRICT SURVEYOR OF EAST HACKNEY (SOUTH) AND NORTH BOW *v.* J. BEHREND.

THIS was a case of reconstruction of roofs to dwelling-houses, neglecting to renew the outside of the old flues where passing through the roofs, and to afford facilities for inspection by the District Surveyor. It was heard at Worship-street Police-court on the 8th inst., before Mr. J. R. W. Bros.

Defendant, a builder of Cambridge-road, E., had completely reconstructed the roofs of three dwelling-houses without in every case renewing the outside of the flues where they passed through the roofs against which the roof timbers were placed, and had covered up the roofs so that they could not be inspected, though repeatedly asked by the District Surveyor to allow him to inspect them.

Defendant was ordered to execute the work and to open up the roofs for the inspection of the District Surveyor within three weeks: 12*s.*, costs allowed in each of the three cases.

LONDON COUNTY COUNCIL AND ADVERTISEMENT HOARDINGS.

AT Worship-street Police-court, a few days since, Mr. Chilvers, solicitor, appeared in support of two adjourned summonses taken out by the London County Council against the Partington Advertising Company in respect of a hoarding near the Great Eastern station at Bethnal Green.—Mr. Philbrick defended. On the previous occasion the defendant company had given an undertaking through their solicitor, that the work required in the way of strengthening the hoarding should be done within a week. — Mr. Chilvers explained that the summonses had been taken out under Section 83 of the London County Council Act for failing to remove a temporary structure when required under Section 200, Sub-Section 3, for retaining such a structure after due notice to remove. The facts and notices were admitted, and the defendants' foreman (Henry George Townsend) was called to prove that the work had been done and that he had failed to get the certificate simply because the District Surveyor could not be found at his city office. Just at the moment Mr. Notley, the District Surveyor, entered the Court, expressed himself satisfied with the work done on the hoarding, and produced his certificate to that effect. Mr. Chilvers pressed for a penalty on the ground that the hoarding had been kept up eighteen months after the licence had expired, and Mr. Philbrick urged in reply that the London County Council were responsible for at least twelve months of the delay.—This Mr. Notley admitted, and in the end the magistrate imposed a penalty of 1*s.* and 23*s.* costs on the first summons and adjourned the other summons *sine die* to see whether the London County Council granted a new licence for the structure.—*Morning Advertiser.*

IMPORTANT ACTION UPON AN AWARD.

IN the King's Bench Division, on the 12th inst., Mr. Justice Lawrance delivered a considered judgment in the case of the Long Eaton Recreation Grounds Company, Limited, *v.* the Midland Railway Company. This was an action by the plaintiffs upon an award. The facts sufficiently appear from the following précis of the written judgment of his lordship.

The judgment stated that the defendants were the freeholders of land situate on the north-west of Springfield-avenue, Long Eaton, Derbyshire, which they purchased from grantees of the plaintiffs. The conveyances from the plaintiffs to these grantees contained covenants that they would not erect, or permit to be erected, any erection or building of any kind except a fence wall not more than 2 ft. high, with suitable iron palisades, nearer to Springfield-avenue than the line drawn on the plan annexed to their conveyance, and marked "building line," and would not erect any buildings on the land conveyed other than private dwelling-houses, with proper conveniences thereto, fronting Springfield-avenue, of a certain value, and would not carry on upon the land conveyed any trade or business of a noisy or offensive character. The defendants, when they purchased the land in question from these grantees of the plaintiffs, took with notice of these restrictive covenants. The defendants had constructed a railway embankment with a permanent railway on the land, and it was admitted that the embankment encroached beyond the building line. Instead of a 2-ft. fence wall they had erected a post and rail fence nearer Springfield-avenue than the building line, and defendants intended to run trains along the railway. In his lordship's opinion each of these specified acts, if done by a private purchaser of the defendants' land, would have been a breach of the restrictive covenant for which such a purchaser would be liable to be restrained by injunction. On defendants' behalf it was argued that a railway embankment was not a "building" within the meaning of the covenant, but his lordship held that it was a "building" within the meaning of the covenant, the object of which was to maintain a uniform range of buildings. The question to be decided was whether the land of the plaintiffs had been "injuriously affected" by the execution of these works within Section 68 of the Lands Clauses Act, 1845. His lordship held that there had been a physical interference by the defendants with the right of the plaintiffs to have no buildings other than those of a certain size and description, as specified in the covenant, erected on land which the defendants had taken. There had been a similar interference in the plaintiffs' right to have the building line regarded, and the brick wall built as provided, if built at all. And there had also been an interference with their right by express covenant that this land should not be used for any business of a noisy character. His lordship thought that all these rights were rights which the plaintiffs were entitled to make use of in connexion with their property on the east side of Springfield-avenue. They only existed for the purpose of maintaining and improving that property, and any covenant entered into with them must necessarily be entered into with a view to, and in connexion with, the land to which the plaintiffs were indebted for their name and existence. His lordship had no doubt whatever that the covenants by the defendants' predecessors in title gave an additional market value to the plaintiffs' property, and that, by reason of the defendants' interference, the plaintiffs' property, as a property, was lessened in value apart from the uses to which they were at present putting it. The real question on this part of the case was whether the benefit of a restrictive covenant was matter for compensation if none of the land was taken for the benefit of which the restrictive covenant was imposed. His lordship thought that the claim for compensation was well founded under the Lands Clauses Act. He thought that upon all these claims the plaintiffs were entitled to compensation, and gave judgment for them for 650*l.*, the amount of the award with interest.

Mr. Young, K.C., and Mr. W. H. Stevenson appeared for the plaintiffs; and Mr. Baggalay, K.C., Mr. W. J. Noble, and Mr. C. H. Sargant for the defendants.

THE ACTION AGAINST THE BRADFORD CORPORATION.

MR. JUSTICE JOYCE, in the Chancery Division on the 3rd inst., delivered a considered judgment in the case of Ambler & Sons, Limited, *v.* The Bradford Corporation. The case was reported in the issue of the *Builder* of August 3.

In this case the plaintiffs claimed an injunction against the defendants to restrain them from obstructing the flow of water in Bradford Beck and from allowing certain sluice gates already erected across the beck to remain. The plaintiffs claimed from the defendants 33,794*l.* for damage caused to them on July 12, 1900, by reason of the obstruction. Defendants alleged contributory obstruction on plaintiffs' part, denied obstruction of the kind complained of, and set up that the damages were the result of *vis major*. The action turned upon whether the damage done to the plaintiffs' premises was caused by the defendants' interference with the Bradford Beck, which passed under the plaintiffs' works, and which had so passed since the erection of the works in 1864. Various areas of land had been purchased by the plaintiffs since 1864, until they became owners of both sides of the beck. In 1899 defendants, at some distance below plaintiffs' premises, erected certain sluices in connexion with their electric lighting undertaking. On July 12, 1900, during a heavy thunderstorm, the beck, in which there was usually from 6 in. to 12 in. of water, was flooded and did damage to the plaintiffs' premises to the extent of upwards of 33,000*l.*, which plaintiffs contended would not have happened if the flow of the beck had not been interfered with by the defendants' works.

His lordship dismissed the plaintiffs' action with costs, on the ground that the Corporation's works did not materially contribute to the damage caused by the flooding of the Bradford Beck.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

6,916.—AN APPLIANCE FOR THE GOVERNORS FOR GAS BURNERS: *F. Goodson.*—In the plug cock are passages for the gas which is admitted through a socket, and is then conveyed through one of the passages into a space over a floating diaphragm, and thence, through other ports, tubes, and a chamber, to the outlet, there is another passage that communicates with a space beneath the diaphragm; a recess in the cap throttles the upper opening of one of the latter tubes with the rising of the diaphragm, so that the governor will continue to operate when the flame has been lowered by means of the plug tap; modifications of the invention provide for those forms whereby the gas is conveyed through horizontal passages, or downwards through the governor which is after the kind specified in Nos. 24,293 of 1898, and 9,504 of 1899.

6,920.—CRANES: *A. E. Williams.*—The lifting-rope is passed from the winding-drum over a pulley at the end of the jib, and so over a pulley upon a travelling carriage to the skip, the latter pulley being carried by a frame that rotates freely about an axis parallel to the jib. From a second drum upon the axle of the main drum a rope is passed around pulleys at the top of the crane, and thence to a balancing weight, and from the inner end of the travelling carriage a rope is passed to another drum, whence another rope is passed to a balancing weight, so that if there is no load the latter weight impels the carriage inwards along the jib, but a load will tend to overpower the action of the weight and to impel the carriage outwards along the jib, at the outer end of which it can be retained with a catch.

6,936.—ELECTRICAL SWITCHES: *E. F. Moy & E. F. Moy, Limited.*—As an improvement of the quick-break switch specified in No. 17,560 of 1890 the inventors fit a spindle-plate, which has two projecting stops turned upwards; upon the base and through the plate they insert the rigid spindle; one of the stops engages with a lug that projects downwards from one of two plates which hold the bridge-piece, a spring effects a quick break, and the handle which is disposed loosely upon the spindle has pins that work in slots in the other of the two plates for making contact. The contrivance is described as being available for single, throw-over, or double-pole switches.

6,951.—ELECTRICAL CURRENT METERS: *L. F Steele.*—For use as an am-meter or volt-meter is devised a tapered iron core hung upon the arm of a horizontal bar that is carried only by the inner ends of flat spiral springs, of which the outer ends are clamped on to a support which a screw adjustably holds against a slotted back-plate; a pointer at one end of the bar traverses a graduated arc; a stationary coil acts upon the core from which an extension moves with slight friction in a pierced guide.

6,977.—A HINGE: *F. Rüegg.*—The flaps of the hinge are cut away, whilst enough of them is left to prevent splitting of the screw-holes, and the flaps can be pressed into the wood without injury to it.

6,993.—DISINFECTION OF LAVATORIES, URINALS, &c.: *C. Fell.*—For purposes of disinfection the

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supply cisterns are made so as to contain perforated vessels which have been charged with chloride of lime mixed with water to the consistency of mortar.

6,996.—WORKING OF WOOD: *I. Chorlton and W. Wentworth.*—The rotatory cutters of a planing and moulding machine are mounted so as to give a progressive or slanting cut by setting the edge of each cutter angle-wise in reference to the axis of the imaginary cylinder which the edges cut out. The cutters are clamped with plates on to the cutter-block, the plates being bolted at one end and fulcrumed in a recess at the other end. The invention extends to cutters and cutter-blocks for planing flat, as well as for planing flat and curved contours.

7,010.—AN APPLIANCE FOR DOMESTIC AND OTHER FIRES, &c.: *F. Whitehead.*—Air is conveyed through a cone-shaped tube, which should have a D-section, that is to be attached to the fire-bars; in one form of the tube it may be inserted between two bars, having upon it a projection of which the inclined surface will press against the upper bar, and a projection that will press against the lower bar.

7,018-9.—SAFETY APPARATUS FOR USE WITH LIFTS: *F. Fletcher.*—Side-plates on a cross-beam are slotted for the hoisting-rope shackle which is held with hooks that are pivoted upon an axis between the plates; the hooks are linked at their lower and outer ends to sliding-bars, and a roller at the outer end of each bar will—if over-winding occurs—strike a roller upon the shaft so as to drive the bar inwards and liberate the shackle. The lower ends of rods that carry the beam are inserted into boxes and have springs which the tension of the rope will press under normal conditions; the fall of the beam at the release of the rope will throw dogs into engagement with fixed sectional racks, of which the outer ones are plain and the middle one is toothed. 7,019.—A fixed and a movable cross-beam are fitted on the top of the cage, the lower ends of hanging rods inserted into fixed boxes are provided with rubber springs to be pressed together, under normal conditions, by the tension of the lifting-rope, but if the rope is broken the springs will lower the movable beam, and so (by the action of links) cause pivoted dogs to engage with a double rack-bar for holding up the cage. The rack-bar is bolted between two plain sections that engage with guide boxes upon the cage; balancing cables are passed from the movable beam to pulleys upon the cross-beam, and their tension contributes to the lowering of the latter.

7,024.—A VENTILATING SHAFT TOP: *W. H. Gaskell.*—A flanged tier of louvres carries a pair of pyramids or cones having openings at their bases; in another form the outer cone and the lower louvres are discarded for a small ring of arches that rest upon the inner cone.

7,056.—TANKS FOR BUILDINGS: *H. R. Vaughan.*—The concrete top floor, which is supported with iron or steel joists, and the sides or parapet (being of brick laid in concrete) are coated with a roofing composition, and layers of roofing-felt are nailed on to the corner fillet and the wooden wall-plate, the space between the felt and a wall built within is filled with the composition; two half-rings clamp the felt bottom to a bottom flanged pipe, which is bolted to cross-joists, or the pipe can be screwed at both its ends for ribbed washers which bear underneath the concrete and upon a washer.

7,094.—DRINKING TROUGHS FOR CATTLE: *J. H. Hanson.*—On the trough, for an automatical supply, is pivoted an inner vessel of which one side is pierced and the hinged cover is, under normal conditions, held horizontally with a spring, but as the animal drinks the cover is pressed downwards—the cover can be retained in either position with sliding bolts. For the supply a water vessel is placed in a water tank, or is joined to a service pipe, and a float in the vessel works a valve in a water pipe which is set in union with either a supply pipe or a discharge pipe that will empty the vessel and troughs by a three-way cock. A nut upon the float serves for the adjustment of the valve.

7,096.—ARTIFICIAL STONE: *A. Grünberg.*—For an artificial stone free from air the dry components are fed into a mixing chamber from which the air has been exhausted before water is admitted, then water—as free from air as is possible—is circulated from a reservoir through a pump, the mixing-chamber, and the stirring-apparatus; the tubular vertical shaft of the stirring-apparatus is joined to hollow-bladed stirring-arms faced with perforated metal and clamping-rings stretch straining-cloths over the blades.

7,119.—CHIMNEY TOPS: *J. Symington.*—Horizontal slots are cut in the sides of the uptake, which is tapered slightly, and curved rising baffles or guide-plates are arranged behind the slots of which the tongues are bent outwards.

7,136.—PROCESS OF MOULDING BRICKS: *W. Dünkelberg.*—A set of moulds are formed by clamping metal lining and partition plates together between side and end pieces with bolts so that the moulds may be taken to pieces; grooves cut in the side and end plates will take lugs or feathers upon the lining-plates which are fastened with melted sulphur, which may also be used for the packing-pieces between the ends and sides of the mould and the linings.

7,139.—MANUFACTURE OF PORTLAND CEMENT: *E. H. Hurry and H. J. Seaman.*—After the materials have been calcined and mixed with an excess of lime they are heated and fused, and then, when solidified, are pulverised. For purposes of fusion is devised a vertical blast furnace, having a sheet-iron shell and a lining of some refractory substance, and a chamber at its top in which the components are in the first place partially calcined. When the resultant fluid mass has been tapped into a car, it is there granulated with a water spray, a hoisting engine lifts the car, and its contents are discharged from the hopper and so to a grinding mill. (See also Nos. 23,145 of 1895, and 2,896 and 2,896A of 1898.)

7,164.—A SPANNER: *C. Titus.*—A head around a loose eye, with openings for two differently sized nuts, is attached at each end of the handle. The teeth of the eye take two spring pawls which are to be worked with a pivoted loop that engages with their tail ends for tightening up or loosening a nut; either one of the pawls is set into gear, and the handle is reciprocated.

7,182.—A METHOD OF GLAZING: *H. J. C. Bates.*—For glass houses are employed pierced and flanged triangular plates or clips which affix the panes to plain sash bars and rafters, the clips or plates being secured with screws or nails.

7,184.—A MACHINE FOR CUTTING DOVETAILS OF WOOD: *L. M. Messinesi.*—A rotating tool is fed sideways across one board, for cutting the mortises, whilst for cutting the tenons the recesses between them are cut out by the feeding lengthwise of another rotating tool (of which the adjustable blades are to be fixed with set-screws) against another board; the sides of the tenons and mortises will fit exactly, as they have the same degree of curvature; a tool having convexed sides will cut the mortises of concealed dovetailed work; it is fed sideways into the end of one of the boards, so as to leave a portion of the board at the end of every mortise.

7,264.—MEANS OF REMOVING RUST FROM IRONWORK: *Baron de G. J. C. M. Liebhaber.*—The girders, &c., are covered with a paste composed of free sulphuric acid and mixed with a base of china clay, lime, plaster of Paris, or similar suitable substances; to concentrated sulphuric acid are added water, together with a small amount of common salt or calcium chloride, &c.; and carbonate of lime is stirred up with the mixture; or limestone may be treated with hydrochloric acid with the addition of sulphuric acid and nitrates; nitric acid may be applied to the cleaned surface, which can then be rubbed with agate or steel.

MEETINGS.

WEDNESDAY, AUGUST 21.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

SATURDAY, AUGUST 24.

Northern Architectural Association.—Visit to South Shields.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 29.—By T. P. & A. SAUL (at Sleaford).

Ewerby Thorpe, Lincs.—The Waith Farm, 148 a. 3 r 2 p., f. £2,550

July 30 and 31.—By DRIVER, JONAS, & Co. (at Chepstow).

Chepstow, Monmouth.—Crossway Green House, Crossway Green Villa, and 16 a. 2 r. 28 p., f. 2,530

Crossway Green, building land, 12 a. 1 r. 5 p., f. 1,250

Devauden Green, Mon.—Two freehold cottages and 12 a. 0 r. 19 p. 335

Twelve enclosures of land, 13 a. 1 r. 9 p., f. 250

Four freehold cottages and 18 a. 3 r. 1 p. 375

A freehold farm, 23 a. 1 r. 8 p. 510

Seven freehold cottages and 28 a. 1 r. 34 p. 850

Various enclosures, 15 a. 3 r. 38 p., f. 290

Llansay, Mon.—Wern Farm, 86 a. 1 r. 19 p., f. .. 1,200

Cwrt-Brychan Farm, 260 a. 2 r. 30 p., f. 2,500

Llanfair Farm, 110 a. 0 r. 8 p., f. 1,070

Dyffryn Farm, 173 a. 3 r. 16 p., f. 1,650

Llanvihangel-tor-y-mynydd, Mon.—Eight enclosures of grass land, 36 a. 1 r. 22 p., f. 460

Freehold cottage and 5 a. 2 r. 33 p. 110

Tymawr Farm and Woods, 133 a. 2 r. 33 p., f.. 1,300

Four freehold cottages and 17 a. 0 r. 26 p. 420

Cobblers Plain Farm, 12 a. 2 r. 13 p., f. 290

Three pasture fields, 4 a. 0 r. 33 p., f. 160

Four freehold cottages and 2 a 2 r. 15 p. 265

Two freehold cottages and 0 a. 2 r. 38 p. 110

Four cottages, chapel, and 14 a. 0 r. 38 p., f. 417

Star Hill Estate, 23 a. 1 r. 37 p., f. 470

Thirteen freehold cottages and 28 a. 1 r. 7 p. 1,125

Llanishen, Mon.—Ten freehold cottages and 31 a. 3 r. 15 p., f. 1,030

Various enclosures, 17 a. 0 r. 10 p., f. 306

The Methodists' Chapel and 8 a. 3 r. 23 p., f. .. 270

Prysg Wood, 20 a. 3 r. 30 p., f. 100

Cottage residence and 3 a. 1 r. 28 p., f. 160

Chepstow, Mon.—Bridge-st., The Bridge Saw Mills and 1 a. 0 r. 18 p., f. 600

July 31.—By BALCH & BALCH (at Camden Town).

Kentish Town.—39 and 41, Lynton-st, u.t. 66½ yrs., g.r. 14*l.*, r. 100*l.* 975

August 1.—By WORSFOLD & HAYWARD and WEST, USHER, & Co. (at Deal).

Deal, Kent.—The Deal and Mongeham Breweries, with sixty-three licensed houses, &c., f. 93,000

By J. M. LEEDER & SON (at Swansea).

Llansamlet, Glamorgan.—The Foxhole Tin Plate Works, u.t. 31, 60, and 69 yrs., r. 299*l.* £4,500

By G. E. SWORDER & SONS (at Bishop's Stortford).

Anstey, Herts.—Two enclosures, 11 a. 3 r. 3 p., f. 225

A freehold tenement and 8 a. 1 r. 37 p. 230

August 2.—By G. B. HILLIARD & SON (at Chelmsford).

Woodham Ferris, Essex.—Holland's Farm, 39 a., f. 400

By H. J. AUSTEN & SONS (at Tunbridge Wells).

Wadhurst, Sussex.—Beggar's Bush Farm, 37 a. 1 r. 0 p., f. 1,130

Weston's and Partridge's Farms, 87 a. 2 r. 39 p., f. 1,500

Olive's Wood, &c., 14 a. 2 r. 5 p., f. 320

Pimlico Holding, 3 a. 1 r. 17 p., f. and c. 400

By J. M. LEEDER & SON (at Brecon).

Devynock, Brecon—Cwmwysk Ganol Estate, 122½ a., f. (including timber) 4,170

By DAVID J. CHATTELL.

Chislehurst.—Royal Parade, Clifton Villa and ½ a., f., r. 90*l.* 1,460

Barnes.—72, Lonsdale-rd., part f. and part u.t. 45½ yrs., g.r. 13*l.*, e.r. 65*l.* 550

By GRAVES & SON.

Westbourne-pk.—13, Leamington-rd. Villas, u.t. 55 yrs., g.r. 10*l.* 10s., r. 60*l.* 500

18, Tavistock-rd., u.t. 55 yrs., g.r. 7*l.* 10s., r. 65*l.* 550

By HAWES & Co.

New Malden, Surrey.—Malden-road, a plot of land, f. 235

Thetford-rd., three plots of building land, f. 435

By LEWIS & SPAIN.

Peckham.—308 and 314, Commercial-rd., f. r. 52*l.* 800

August 3.—By SEWELL & BARNES (at Norwich).

Aylsham, Norfolk.—The Manor House and 9 a. 1 r. 14 p., f. 1,400

Three enclosures of land, 29 a. 1 r. 3 p., f. 1,000

Two enclosures of land, 7 a. 2 r. 31 p., f. 500

By THORNBORROW & Co. (at Kendal).

Dillicar, Westmorland.—High Park and Low Park Estate, 197 a. 0 r. 21 p, f. 1,690

August 8.—By CHINNOCK, GALSWORTHY, & CHINNOCK.

Blyth, Notts.—Barnby Moor House and 36 a. 2 r. 35 p., f. 8,000

By J. & W. JOHNSON & Co. (at Masons' Hall Tavern).

Victoria Pk.—Speldhurst-rd, The Earl Derby p.-h., u.t. 21 yrs., r. 100*l.*, with goodwill 2,500

August 9.—By H. J. CHEFFINS.

Clavering, &c., Essex.—Clavering Hall Farm, 506 a. 2 r. 12 p., f. 7,100

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

***** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.**

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 11 0	"	" "
Facing Stocks	2 12 0	"	" "
Shippers	2 8 0	"	" "
Flettons	1 8 6	"	at railway depôt.
Red Wire Cuts	1 14 6	"	" "
Best Fareham Red	3 11 0	"	" "
Best Red pressed Ruabon Facing.	5 5 0	"	" "
Best Blue Pressed Staffordshire	4 4 6	"	" "
Do., Bullnose	4 9 0	"	" "
Best Stourbridge Fire Bricks	4 2 6	"	" "
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	"	" "
Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats	17 0 0	"	" "
Double Stretchers	19 0 0	"	" "
Double Headers	16 0 0	"	" "
One Side and two Ends	19 0 0	"	" "
Two Sides and one End	20 0 0	"	" "
Splays, Chamfered, Squints	20 0 0	"	" "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats	14 0 0	"	" "
Double Stretchers	15 0 0	"	" "
Double Headers	14 0 0	"	" "
One Side and two Ends	15 0 0	"	" "
Two Sides and one End	15 0 0	"	" "
plays, Chamfered, Squints	14 0 0	"	" "
Seconds Quality White and Dipped Salt Glazed	2 0 0	"	less than best.
	s. d.		
Thames and Pit Sand	7 3	per yard, delivered.	
Thames Ballast	6 0	"	"
Best Portland Cement	34 6	per ton, delivered.	
Best Ground Blue Lias Lime	25 6	"	"

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivere .
Stourbridge Fire-clay in sacks, 28s. od. per t n at riv dpt.

[See also page 165.

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COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*New Offices, &c.	Hearts of Oak Benefit Society	Premium 100*l.*, 75*l.*, 50*l.*	Nov. 15

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Making-up Rectory Grove	Leigh (Essex) U.D.C.	A. J. Arthy, Council Offices, Leigh-on-Sea	Aug. 20
Houses, Springhill, Aberdeen	Mr. H. M'Lennan	Jenkins & Marr, Civil Engineers, 16, Bridge-street, Aberdeen	do.
Cottages, New Broughton, Wrexham	Mr. W. W. Evans	Davies & Moss, Architects, 2, Temple-row, Wrexham	do.
Disinfecting Station, Feeder-road	Bristol Corporation	T. H. Yabbicom, Engineer, 63, Queen-square, Bristol	do.
Building Work, Old Abbey Church, Bangor, Ireland	.....	H. Seaver, Civil Engineer, 128, Royal-avenue, Belfast	do.
Avenue, Malone-road and Lisburn-road, Belfast	.....	do.	do.
Chapel, Schools, &c., Hoyland Common	.....	W. J. Sykes, Architect, Hoyland, near Barnsley	do.
Hospital, Stonehaven, N.B.	Kincardine County Council	Brown & Watt, Architects, 17, Union-terrace, Aberdeen	do.
Eighteen Houses, &c., Darefield, Yorks	Mr. T. Wilkinson	A. B. Linford, Architect, Wombwell, near Barnsley	Aug. 21
Extensions to Club Buildings, Perth	.....	W. H. Childs, 69, Cymmer-road, Porth, Wales	do.
Schools, Cappoquin, co. Waterford	.....	S. F. Hynes, Architect, 21, South-mall, Cork	do.
Long Wall	Saddleworth U.D.C.	J. H. Reynolds, Surveyor, Council Offices, Uppermill	do.
Widening Pennington-lane, &c., Liverpool	South Lancs. Electric Traction Co.	Kincaid & Co., Engineers, 29, Great George-street, S.W.	do.
Additions to Workhouse	Stroud Guardians	W. H. C. Fisher, Rowcroft, Stroud	do.
Buildings at Gasworks, Hunstanton	New Hunstanton U.D.C.	J. S. B. Glasier, Council Offices, Hunstanton	do.
Granite (500 tons)	South Mimms R.D.C.	G. D. Byfield, 16, High-street, Barnet	do.
Granite Road Metal	Ware U.D.C.	G. H. Gisby, Town Hall, Ware	do.
Four Shops, Woodside, Aberdeen	Northern Co-op. Society, Limited	R. G. Wilson, Architect, Union-street, Aberdeen	Aug. 22
Road Works, &c., Back Astley-terrace, &c.	Tynemouth R.D.C.	A. S. Dinning, 21, Ellison-place, Newcastle	do.
Buildings, &c., Throstle-street	Blackburn Corporation	W. Stubbs, Civil Engineer, Municipal Offices, Blackburn	do.
House, Stables, &c., Bridlington	Mr. J. Burrell	J. Earnshaw, Architect, Carlton House, Bridlington	do.
Building Works, St. Paul's Church, Llanelly	.....	W. Griffiths, Architect, Falcon Chambers, Llanelly	do.
Court and Mortuary, Quakers' Friars	Bristol Corporation	T. H. Yabbicom, Engineer, 63, Queen-square, Bristol	do.
Cottages, &c., near Darlington	Sir T. Wrightson, Bart.	G. G. Hoskins, Architect, Darlington	do.
Additions to Gasworks, Tonypandy	Rhondda U.D.C.	O. Thomas, Engineer, Pentre, R.S.O., Glam.	do.
Additions to Hospital	Stratford-on-Avon Hosp. Comte.	R. Dixon, Architect, Municipal Offices, Stratford-on-Avon	do.
Additions to School, Queensberry-road	Longton (Staffs.) School Board	J. H. Beckett, Architect, Longton	do.
Fire Station, &c., Church-street	Luton Town Council	Borough Surveyor, Town Hall, Luton	Aug. 23
Road Works, Penygraig, Pentre	Rhondda U.D.C.	Surveyor, Council Offices, Pentre R.S.O., Glam.	do.
Additions, &c., to Chapel, Aberdare	.....	T. Roderick, Architect, Ashbrook House, Aberdare	Aug. 24
Chapel, Market Weighton, Yorks	.....	W. G. Smithson, Architect, 13, Bond-street, Leeds	do.
Water Supply Works, Stechworth	Newmarket R.D.C.	F. S. Courtenay, Engineer, Broad Sanctuary, Westminster, S.W.	Aug. 26
Road Works, Thornton-road	Bootle (Lancs) Corporation	Borough Engineer, Town Hall, Bootle	do.
Sewerage Works	Fenny Stratford U.D.C.	J. Chadwick, Engineer, Bletchley, Bucks	do.
Alterations, &c., to Town Hall	Hove (Sussex) Town Council	H. H. Scott, Surveyor, Town Hall, Hove	do.
Lecture Hall, Stewartstown, Co. Tyrone	.....	H. Hobart, Architect, Dromore, co. Down	do.
Cattle Market	Truro Town Council	M. Lea, Engineer, Truro	Aug. 27
Two Culverts, Ludgershall	Aylesbury R.D.C.	W. J. Cook, Surveyor, 69, High-street, Aylesbury	do.
*Water Closets, Fence Walls and Iron Railings	Strand Union	A. A. Kekwick, Architect, 18, Outer Temple, E.C.	do.
*Seaside Homes, Rustington, near Littlehampton	Metropolitan Asylums Board	Rowland Plumbe, Architect, 13, Fitzroy-square, W.	Aug. 28
*Additions to Asylum, Denbigh	The N. Wales Counties Lunatic Asy.	T. M. Lockwood & Sons, Architects, Chester	Aug. 30
Alterations to School	Tynemouth School Board	F. R. N. Haswell, Architect, Tyne-street, North Shields	do.
*Alterations, Camberwell Green	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	Aug. 31
*Extensions of the Borough Asylum, Middlesbrough	Middlesbrough Corporation	The Clerk, Municipal Buildings, Middlesbrough	Sept. 2
Cookery Centre, &c., Norfolk-street	Boston School Board	J. Rowell, Architect, Market Place, Boston	Sept. 3
*Junior Mixed School, Enfield Lock	Enfield School Board	G. E. T. Lawrence, Architect, 22, Buckingham-street, W.C.	do.
*Drainage Works, Pembury	Tonbridge R.D.C.	W. V. Graham, Engineer, 5, Queen Anne's Gate, S.W.	do.
*Granite Kerbing and Channelling	Hove Town Council	Borough Surveyor, Town Hall, Hove	Sept. 4
Blocks of Buildings, Manston Hospital	Leeds Corporation	E. T. Hall, Architect, 54, Bedford-square, W.C.	do.
School, Holyhead, N. Wales	.....	J. Owen, Architect, Menai Bridge	Sept. 5
*Timber	Metropolitan Borough of Stepney	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	Sept. 9
*Dust Vans, &c.	do.	do.	do.
*Lavatory Buildings	Hertfordshire County Council	County Surveyor, 41, Parliament-street, S.W.	do.
*Schools in Littleworth	Mansfield School Board	Vallance & Westwick, Mansfield	Sept. 16
*Additional Outfall Sewers at Crossness	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.	Oct. 8
Additions to Workhouse	Brampton (Cumberland) Guardians	T. T. Scott, Architect, 43, Lowther-street, Carlisle	No date
Church Institute, Bulwell, Notts	.....	W. V. Betts, Architect, Bank Offices, Old Basford	do.
Business Premises, Botchergate	Carlisle South-End Co-op. Society	T. T. Scott, Architect, 43, Lowther-street, Carlisle	do.
Cemetry Works, Newtownstewart	.....	E. J. Toye, Architect, Londonderry	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Leeds Corporation	4*l.* 4*s.* per week	Aug. 19
Surveyor	Matlock U.D.C.	.....	do.
Inspector of Nuisances	do.	60*l.*	do.
Principal	Wexford Technical School	250*l.*	do.
*Works Manager	Swansea Corporation	.....	Aug. 24
Quantity Surveyor	East Ham U.D.C.	.....	Aug. 26
*Engineering and Surveying Assistant	County Boro' Burton-upon-Trent	Commence at 130*l.* per annum	Aug. 30
*Architectural Assistant	do.	do.	do.
City Engineer and Town and Property Surveyor	Newcastle-on-Tyne Corporation	1,000*l.*	Sept. 10
*Divisional Main Road Surveyor	West Riding Highways Committee	.....	No date
Assistant Engineer	Birmingham & Dist. Drainage Bd.	130*l.*	do.
Accountant	Derwent Valley Water Board	400*l.*	do.
Clerk of Works	Todmorden Borough	State	do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xx

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PRICES CURRENT (*Continued*).

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. dep't.
Bath "	1 7	" "
Farleigh Down Bath	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks	2 2½	" "
Red Corsehill "	2 5	" "
Red Mansfield "	2 4½	" "
Hard York in blocks	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt
" " 6 in. Rubbed Ditto	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" " 2 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
" " " 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3-in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep.
" best seconds "	10 15 0	" "
16× 8 best "	6 2 6	" "
20×10 best blue Portmadoc	10 18 0	" "
16× 8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green	11 2 6	" "
16× 8 " " "	6 15 0	" "
20×10 Permanent green	10 0 0	" "
16× 8 " "	5 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 6	per 1,000 at rly. depôt.
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	48 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. ornamental Do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" " "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 1½ in.	0 10 0	more than battens.
½ in.	1 0 0	more than battens.
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
" " 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 0 0	16 0 0
" " 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
" " " 3 in. by 9 in.	13 0 0	14 0 0
" " battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders " "	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
" " galvanised (* And upwards, according to size and gauge.)	16 0 0	- - -
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 17 6	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin "	0 1 2	- - -
Copper nails "	0 1 2	- - -
BRASS—		
Strong Sheet "	0 0 11	- - -
Thin "	0 1 1	- - -
TIN—English Ingots "	0 1 4½	- - -
SOLDER—Plumbers' "	0 0 7	- - -
Tinmen's "	0 0 6	- - -
Blowpipe "	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 0	per ton delivered.
Fine "	38 0	" "
Coarse Keenes and Parian cement	51 6	" "
Fine do. do.	59 6	" "
Robinson's Fireproof Cement	51 6	" "
Do. Finishing "	56 6	" "
(Exclusive of the ordinary charge for sacks.		
Whiting	30 0	" "

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
" " fourths	2½d.	" "
21 oz. thirds	3½d.	" "
" " fourths	3½d.	" "
26 oz. thirds	5d.	" "
" " fourths	4½d.	" "
32 oz. thirds	6d.	" "
" " fourths	5½d.	" "
Fluted sheet, 15 oz.	3½d.	" "
" " 21 "	4½d.	" "
½ Hartley's Rolled Plate	3d.	" "
⅝ " " "	3½d.	" "
¾ " " "	4d.	" "

PRICES CURRENT (*Continued*).

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes	0 2 10	per gallon
" " " in barrels	0 2 11	"
" " " in drums	0 3 1	"
Boiled " " in pipes	0 3 0	"
" " " in barrels	0 3 1	"
" " " in drums	0 3 3	"
Turpentine, in barrels	0 2 3	"
" in drums	0 2 5	"
Genuine Ground English White Lead	22 0 0	per ton
Red Lead, Dry	22 10 0	"
Best Linseed Oil Putty	0 9 0	per cwt.
Stockholm Tar	1 10 0	per barrel

VARNISHES, &c.

	per gallon £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BARROW-ON-SOAR.—For the execution of sewerage works, &c., Newtown Linford, for the Rural District Council. Mr. F. Griffith, C.E., Bowling Green-street, Leicester. Quantities by engineer:—

Contract No. 1.—Sewerage Works.

Johnson & Son	£3,045 0 0	Riddett & Son	£2,381 14 6
C. Chamberlain	2,904 1 9	Mason & Co.	2,370 19 0
H. H. Barry	2,500 0 0	John Holme, Leicester*	2,146 18 3
T. Philbrick	2,418 14 6		

Contract No. 2.—Sewage Disposal Works.

Johnson & Son	£3,303 0 0	Mason & Co.	2,666 13 0
C. Chamberlain	2,986 0 0	Riddett & Son, Leicester*	£2,614 15 4
T. Philbrick	2,939 5 7		
John Holme	2,843 15 7		

CORK.—For alterations and additions to the Eccles Hotel, Glengariff, co. Cork:—

Sam. Hill	£5,641 0 0	W. H. Jones*	£5,092 9 2
Wm. O'Connell	5,580 0 0		

DEVONPORT.—For rebuilding No. 68, Fore-street, for Mr. Gamlen. Mr. H. G. Luff, architect, Devonport:—

Wakeham Bros.	£2,167 0	Smith & Son, Devonport*	£2,039 15
T. May	2,125 0		
Pearn Bros.	2,119 0	Jenkin & Son	2,035 0
Littleton & Son	2,107 0		

HADLEIGH (Suffolk).—For additions to police-station, for the West Suffolk Standing Joint Committee. Mr. A. Ainsworth-Hunt, County Surveyor, Sudbury. Quantities by the County Surveyor:—

Grimwood	£669 0	Castle	£510 0
Downs & Stephenson	590 0	Wheeler, East Bergholt*	498 0
Death	541 14		

HALIFAX.—For the erection of a house, Ellistones, Greetland, near Halifax, for Mr. George Wood. Messrs. J. F. Walsh & G. Nicholas, architects, L. and Y. Bank Chambers, Halifax:—

Masonry.—E. Naylor & Son, Halifax	Accepted on a Schedule.
Joinery.—W. Calverley, Greetland	
Slating and Plastering.—J. Firth, West Parade, Halifax	
Plumbing.—J. Riley, West Vale, near Halifax	

[See also next page.

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LEEDS.—For executing excavation works for police-station, reel-house, &c., Dewsbury-road, for the Corporation. Messrs. Bedford & Kitson, architects, Greek-street Chambers, Leeds. Quantities by the architects :—

Masonry and Bricklaying.

James H. Wood*	£4,900	0	0

Carpentry and Joinery.

Benjamin Wood*	1,891	18	6

Plumbing.

J. E. Bedford*	1,143	17	6

Plastering.

W. Elsworth*	562	8	10

Slating.

W. Atkinson*	169	18	0

Painting.

Roylance & Horsman*	77	8	4
	£8,745	11	2

LONDON.—For erecting parochial buildings at St. Saviour's, Shepherd's Bush. Mr. J. S. Alder, architect, 1, Arundel-street, Strand, W.C. :—

F. T. Chinchen £2,180

LONDON.—For making-up, &c., Margaret-street, Stamford Hill, for the Hackney Borough Council. Mr. Norman Scorgie, C.E., Town Hall, Hackney, N.E. :—

Griffiths & Co.	£708	16	0	G. Porter.....	£675	5	7
Thos. Adams ..	704	3	0	A. T. Catley, Lloyd-sq., W.C.*	646	4	6
Grounds & Newton	681	7	5				

LONDON.—For the erection of artisans' dwellings, Southwark, for the Trustees of Hayles Estate. Messrs. Waring & Nicholson, architects, 38, Parliament-street, Westminster :—

W. Wallis	£10,650	Chessum & Sons....	£8,984
Bastow & Co., Ltd.	10,356	Smith & Sons, Ltd..	8,937
Wilson Bros. & Lamplough.....	10,120	J. M. Patrick	8,900
Nicks & Co.	9,975	E. J. Saunders.....	8,895
Allen & Sons	9,565	J. E. Mitchell	8,824
Thomas & Edge ..	9,468	J. Marsland	8,707
W. J. Renshaw....	9,390	J. Appleby	8,663
Wells & Co.	9,364	Sabey & Son	8,639
Todd & Newman ..	9,269	J. R. Ward	8,537
F. & H. F. Higgs .	9,200	H. L. Holloway	8,500
Jerrard & Sons	9,189	Smith & Son*	8,395
Burman & Sons....	9,179	J. Parsons (withdrawn)	7,777
B. E. Nightingale .	9,125		
Battley, Sons, & Holness	8,997		

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The Builder.

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The Housing Problem.

THE name of the late Mr. Sutton will soon be a household word, rivalling even that of George Peabody. The latter left a sum of 500,000*l.* to be devoted to the erection of wholesome dwellings for the poorer labouring classes; Mr. Sutton has left nearly two millions for the same purpose. Already under the Peabody Trust nearly a million and a half have been expended on land and buildings, and the end is not yet. A fund of this sort, under wise management, increases in value every year. Thanks to the munificence and philanthropy of Mr. Sutton, a new and ampler fund has been started on a career of usefulness. The bequest is not a parochial one, but can be applied to the erection of dwellings in some of the largest provincial towns as well as in London. This is a wise provision on the part of the testator, as the housing problem is as acutely felt and as difficult to solve in the provinces as in the metropolis. There is scarcely a large town or city which has not attempted to do something and which does not feel that more must be done, and the problem is already becoming acute in the smaller towns. We have before us as we write a short but useful Report by Dr. Armstrong, the Medical Officer of Health for Newcastle-upon-Tyne, entitled "Housing of the Working Classes," and containing brief descriptions (and in some cases plans) of tenement dwellings erected by municipal and other authorities in London, Liverpool, Manchester, Edinburgh, and Glasgow. The Report was compiled for the information of the Sanitary Committee of Newcastle, and might have been extended to include Birmingham, Leeds, Southampton, Hull, Nottingham, and many other cities and towns. Throughout the country the problem is forcing itself upon the attention of municipal authorities, and many indeed will be the applications which the trustees of Mr. Sutton's bequest will have to consider.

From whatever standpoint the housing question is considered difficulties present themselves. The *laisses-faire* economist, about whom Carlyle used to wax so wroth, says that the modern method of dealing with the question is entirely mischievous; supply and demand and individual competition will accomplish all that is required, and although it may take a long time, the result will be infinitely better than any which can be attained by interfering with these so-called "laws." Certain it is that the palliation of one evil is often the cause of another. Thus it is quite within the range of possibility that the reduction of rents in subsidised houses may in time lead to a reduction of the wages of the whole class from which the tenants of these houses are drawn, and the last state may therefore be no better than the first. The employer of labour will argue that rates have been increased to provide cheaper and better dwellings for his workpeople, and that it is only fair that the increase in his rates should be counterbalanced by a reduction in wages. Further, the stress of competition among the lowest class of labourers tends always to reduce their earnings to a bare "living wage," and in the long run, therefore, there may be a reduction in wages exactly commensurate with the reduction in rent.

It may, of course, be argued that dwellings for even the poorest can be built to pay, and the evidence of private and public companies may be adduced in support of this view; but, on the other hand, it must be confessed that the rate of interest paid is, as a rule, very low, and that some of these companies, such as that of which Sir Sydney H. Waterlow has been chairman for so many years, are really philanthropic agencies and not money-making concerns. And it is also true that many of the dwellings erected by municipal and county authorities are, from a financial point of view, far from satisfactory. The returns are seldom sufficient to pay the interest and sinking fund, and in many cases there is a large initial loss due to writing down the original cost of the land to what is called "housing value." A private company proceeding on these lines would soon find itself in the bankruptcy court. To a certain extent, therefore, the labouring classes are being provided with houses at less than cost price, the rents being fixed partly according to the cost of the land and buildings, but partly also according to what the tenants are able to pay. Public and private generosity is employed in eking out the insufficient wages earned by the tenants; the sweaters call the tune and the public pays the piper. The housing question thus considered is seen to be merely a part of the still larger labour question.

For these and other reasons many persons are of opinion that public authorities are acting unwisely in erecting buildings of this class. Let them by all means condemn insanitary houses. The owners of the houses have extracted the uttermost farthing of rent, and the onus of keeping the property in sound and wholesome condition rests on them. If they neglect their own interest as well as their duty, let them bear the loss. There is much to be said in favour of this view, but the problem is complicated by leases and other conditions, and especially by the number of small holdings which there may be in a given insanitary area, many of the holdings being so small that it is absolutely impossible to erect new houses on them in accordance with the building regulations of the district. To leave the plots vacant would be a hardship on the owners, and would permanently displace the tenants. It has been suggested that such plots should be pooled together, and sold by auction or otherwise in larger and more convenient areas, and the proceeds divided in some prearranged proportion among the owners. But this makes no provision for the erection of houses in lieu of those pulled down. As a way out of the difficulty the municipal authority sometimes purchases the whole of an insanitary area, and, as has been done at Leeds, sells the land at less than cost price so that houses can be profitably erected thereon by private enterprise. In other cases a few houses here and there in an insanitary area are purchased and demolished, so that the remaining houses may be less crowded and may have more light and air. But many authorities retain the land, and erect upon it blocks of dwellings of a character suited to the locality. Although there is much to be said against municipal authorities becoming landlords, there is also much to be said in favour of this step being taken. The dwellings are likely to be better built and more wholesome than if they are erected by persons whose sole object is to make a good profit, and they will also be kept in better repair. The erection of good buildings in place of insanitary areas reduces the sickness rate,

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and thus reduces the amount of hospital accommodation required.

Into the moral aspect of the question we need not enter, although it is one which ought not to be forgotten, and is indeed probably the one which has had most influence in leading men to devote their time or fortunes towards a solution of the problem. Many men, however, have ceased to inquire whether the balance of argument is for or against municipal dwellings; the slums of a city are admittedly a menace to health and a disgrace to civilisation, and the practical man says—Don't talk, but clear them away as quickly as possible and put something better in their place. Probably this is the view of the majority of the persons who have furthered municipal enterprise in regard to the housing problem.

In a paper read before the Association of House Factors and Property Agents in Glasgow, Mr. Peter Fyfe, Chief Sanitary Inspector of that city, deals with some of the common arguments adopted by property-owners against municipal interference. The paper, now issued as a pamphlet, is entitled "Back Lands and their Inhabitants," the term "Back Lands" being applied to houses or tenements erected in courts or areas in the rear of other buildings, which are usually loftier and of slightly better class. The three arguments commonly urged in favour of the retention of "back lands" are, according to Mr. Fyfe, the following:—

"*First.*—They are there, permitted by former laws and former authorities, and as such their owners have vested rights not to be lightly interfered with;

Second.—They serve a certain class of the population which, on economic and social grounds, could not be equally served in front lands; and

Third.—If they were destroyed, there are no houses in the city or its suburbs of equal size and rents in which their inhabitants could reside."

Mr. Fyfe considers the first argument mainly in regard to the provisions of the Housing of the Working Classes Act, 1890, and shows that the law "hedges an owner round with good weapons of defence." There is really no need to labour this question nowadays; the whole matter can be expressed in a sentence: Property has duties as well as rights, and neglect of the duties involves to some extent a loss of rights.

We may therefore pass on to Mr. Fyfe's reply to the second argument, and here we find some original matter of considerable interest. Under Mr. Fyfe's directions, the female inspectors of Glasgow visited 999 tenements in front properties, and 4,509 in back properties, and ascertained the particulars of rent, wages, and occupation of tenants, &c., in each case. The figures are given in two tables, from one of which the following extract is made; we have, however, inserted a column showing the average weekly earnings per head in the different classes of household:—

It will be observed that the average cubic space in the back tenements is slightly larger than in the front tenements, but that the rents are less. The difference in rent is, however, very trifling, being only 4½d. a week for a single apartment and less than ½d. a week for two apartments. The difference in the earnings in the two classes of tenements is almost equally insignificant. The obvious conclusion is that, "in respect of rentals and earnings, there is little or nothing to choose between them." The figures we have added showing the average earnings per head take us a step further, and prove not only that there is practically no difference between the corresponding tenants in the front and back lands, but that the earnings *per head* in one-apartment tenements are almost identical with those in two apartment tenements. If we apply the same basis of calculation to the rentals of the front tenements, we find that the tenants of the single apartments pay ¾d. a week more *per head* than those who occupy two apartments, and that the weekly rent of two front apartments *per head* is ½d. less than that paid for two back apartments. The respectability of the two classes of tenants, as judged by the inspectors, does not present any marked difference, nor does their nationality or religion, and Mr. Fyfe is "driven to the conclusion that, as between the two, there is no well-marked line which divides them either socially or from the point of view of economics," and adds—"Upon this second ground, therefore, I am bound to say there is no argument whatever for the necessity of a continuance of back lands in our city."

Of course, the figures to which we have drawn attention refer to Glasgow, and to a comparatively small portion only of that city, and cannot be regarded as applicable to other cities, where the conditions of labour and the cost of buildings may be vastly different; but they are undoubtedly a valuable contribution to our knowledge of the housing question.

The third argument is restated as follows:—"If the back lands were destroyed, there are no houses in the city of equal size and rents in which their inhabitants could reside." Mr. Fyfe considers this to be the slum-landlord's best argument for being left alone—"he is a public benefactor *until the public build for the labouring classes.*" The words we have italicised show that Mr. Fyfe is strongly of opinion that private enterprise cannot, or will not, cope with the evil, and this is undoubtedly the general opinion.

But municipal interference is rendered exceedingly difficult by the unsatisfactory nature of the Act of 1890. It was pointed out at the time that the Act was vague and did not go far enough, and that the procedure prescribed by it was unnecessarily complicated, and these criticisms are now endorsed by nearly every one who has had practical experience of its working. Some authorities absolutely refuse to put some parts of it into force because of the onerous burdens it lays upon them, and every authority desires that the period for the repayment of loans should be extended. The period of thirty years which is commonly enforced was apparently adopted originally on the ground that each generation should pay for the works carried out by it. We need not argue this question, but two points may be mentioned; *first*, that the average duration of life is now considerably more than thirty years; if we eliminate infants under one or two years of age, the expectation of life is now over fifty years, and it is only reasonable that the time for repayment should be extended accordingly; and *second*, the probable useful life of the buildings may also reasonably be taken into consideration, and no one will deny that, judging from existing buildings, this will in ordinary circumstances far exceed fifty years; at any rate, the land on which the buildings are erected may well be treated more favourably, and the term of repayment extended to eighty or a hundred years.

Much has been done during the last two or three years to educate public opinion on this subject, and it is certainly high time that pressure was brought to bear on the Government to amend the Housing of the Working Classes Acts in the light of recent experience. Public money is now being poured into the pockets of slum landlords by way of compensation, much of which is thoroughly undeserved. Every business man who is worthy of the name writes off the value of his premises every year a certain proportion for depreciation, and thus accumulates out of his profits a fund for repairs and for ultimate loss when the buildings become unfit for use, and if the owners of old houses fail to do the same, they deserve censure rather than pity. The composition of our legislative bodies is such that property-owners need not fear that they will be harshly treated; the burden of the complaint of sanitary reformers is that they are far too leniently dealt with, and that the public as a whole suffers in consequence both in health and pocket.

—	Total Number of Houses.	Average Cubic Space.	Average Rent per Month.	Average Number of Family.	Average Earnings of Household per week.	Average Weekly Earnings per head.	Respectable Tenants.	Church Attendants.
			s. d.		s. d.		Per cent.	Per cent.
Front Lands.								
1 Apartment	682	1,210	9 9½	3·2	21 1	6 7⅛	82·5	82
2 Apartments	317	1,893	12 1	4·3	28 9	6 8¼	88·6	86
Back Lands.								
1 Apartment	2,638	1,298	8 4½	3	19 7	6 6½	76·0	59·8
2 Apartments	1,871	1,978	11 11½	4·2	28 0	6 8	83·3	74·8

NOTES.

The New Government Offices.

The President of the Institute of Architects has, in a letter in the *Times* of Saturday last, added his voice in favour of the employment of an eminent architect to carry out the late Mr. Brydon's building. That he has not done so earlier is of course due not to any lukewarmness in the matter, but to the consciousness that the public in this country are so ready to attribute any demonstration of the kind on the part of the representative body of architects to self-interested motives. Mr. Emerson obviously refers to this stumbling-block in the concluding sentence of his letter:—

"I can unhesitatingly say that the architectural profession are awaiting the action of the Government in this extremely important matter with the greatest interest, coupled with some anxiety, not from the view of possible professional emoluments, but in the highest interests of the art of architecture."

Of the truth of the closing words there can be no doubt; the difficulty is to get the Philistines of our legislature to understand the existence of such a feeling, accustomed

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as they are to regard architecture as a matter of no real consequence. The words "some anxiety" are in fact a great deal too mild to express the feeling aroused among architects by the proposal of the Government; "great surprise and indignation" would be a more adequate expression. Mr. Emerson uses the same arguments which have been already used by others, as to the importance of the detailing of an architectural design. Something might be added as to the respect due to the memory of the late architect, whose work certainly ought to be carried out by an architect of the same standing and ability as himself, if full justice is to be done to his intentions.

The Widening of Piccadilly.

THE result of an important deputation to the Office of Works of Members of Parliament and others interested in the question of the proposed widening of Piccadilly, last week, is that we have the undertaking of the First Commissioner of Works that nothing shall be done till after the recess of the London County Council, and that if there is not by that time a general consensus of opinion in favour of the scheme, he will feel it his duty to hold back the proposal till there could be an opportunity of further discussion in Parliament. It is satisfactory to find that, at all events, nothing will be done in a hurry. The letter of Mr. Davies, the Chairman of the Improvements Committee of the London County Council, which followed the report of the deputation in last Saturday's *Times*, certainly puts the matter in a rather new light. According to Mr. Davies's statement, this is not a mere scheme to widen a part of Piccadilly between two narrow points; it is one portion of a general scheme for widening the whole of the route eastwards into London, of which Piccadilly forms a portion. The London County Council, he says, obtained powers three years ago for widening Kensington High-street between Church-street and Cumberland-place; they have obtained powers for widening St. George's-place, Knightsbridge, between William-street and Wilton-place; and they have been in communication with the Office of Woods and Forests, who are the freeholders of most of the property on the northern side of Piccadilly between the Circus and Sackville-street, with a view to setting back the northern street line at this point as the leases fall in; but they have not so far succeeded in coming to any arrangement. Mr. Davies's argument therefore is that the widening along the margin of the Green Park is not an isolated improvement, but part of a great general scheme. The obvious commentary lies in the time-honoured stage-retort—"Then why didn't you say so at first?" This is only another example of the mistake that has been made for years in London improvements, of treating each proposed alteration as an isolated matter, instead of considering it as part of a large scheme and in relation to the whole. If the statements now made by the chairman of the Improvements Committee, as to the general and far-reaching nature of the scheme, had been made by the London County Council at the outset, there would probably have been less opposition to the Green Park alteration, and we should at all events have known the meaning of it. We are still of opinion that the part of Piccadilly skirting the Green Park is not the part that wants widening, and that the disadvantages of the alteration would outweigh the advantages; but we willingly admit that Mr. Davies's statement of the case puts it in a rather different light from that in which we at first regarded it.

The Prospects of the Building Trade.

IT is to be feared that the prospects of the building and kindred trades are not very bright. Increased taxation causes a diminution of expenditure by individuals and by trading bodies, and this diminution is felt especially in such matters as building; an inconvenient shop is allowed to remain; the new drain system to a country house is postponed; and so on *ad infinitum*. The shrinkage of business appears to be evident in the Board of Trade Labour Returns for July, since we find that in the carpentering and joinery trade the proportion of unemployed is 3 per cent., as against 1·8 last year; in the furnishing trade 3·1 as against 2·6. In the country districts where there are small employers such intelligence as has reached us is to the effect that work is slack. These reports are not so much to be relied on as the figures of the Board of Trade. The coming months will, it is to be feared, be a hard time for many artisans, but history repeats itself, and there has never yet been a prolonged war and increased taxation which did not press heavily on the country.

Appeals under the Workmen's Compensation Act.

MR. BALFOUR announced last week that he had no hope of being able to proceed further this Session with the Supreme Court of Judicature Bill. This measure, as we stated when it was introduced into the House of Lords, proposes, among other things, to take away appeals under the Workmen's Compensation Act from the Court of Appeal and to hand them over to a Divisional Court of the King's Bench Division. This proposal is now at an end until next spring, at any rate. Meanwhile, there is visible the extraordinary spectacle of the appeals under this Act having been put on one side and allowed to accumulate by the Court of Appeal under the impression that next sitting, two months distant, they would be heard by a Divisional Court. It is obvious that some means of dealing with these arrears must be arranged, otherwise it will be a public scandal. It would not be difficult for a separate division of the Court of Appeal to be formed next sittings to hear these appeals. The Lord Chancellor, the Lord Chief Justice, the President of the Probate Division and Admiralty Division are all *ex-officio* members of the Court of Appeal. It would, therefore, be quite possible to arrange that such a Court should be constituted early next sittings to dispose of all the appeals under the Workmen's Compensation Act which are ready for hearing. Both employers and employed should bring pressure to bear on the Lord Chancellor to effect this object.

The Grammar School, Holt, Co. Norfolk.

THE plans and designs made by Mr. H. Chatfeild Clarke have been adopted for the new school buildings by the governors of the trust, and a tender of 45,980*l.* has been accepted from Mr. G. Riches, of Cromer. The school was founded in 1554 under letters patent granted by Queen Mary to Sir John Gresham, who endowed the foundation with estates and property situated in Norfolk, and in Barbican, Finsbury-place, Fore-street, Whitecross-street, and elsewhere in London. Gresham vested the management of the charity in the Fishmongers' Company, who are the present administrators of the trusts.

Park Chapel, Chelsea.

IT is stated that this old chapel is about to be pulled down and rebuilt at a cost of about 7,000*l.* The chapel was originally erected for a congregation of French Protestant refugees. The fabric, since enlarged to a capacity of 1,300 seats, was restored in 1880 under the superintendence of Mr. Sidney Bannister. It contains some stained glass windows by Messrs. Gibbs & Steward; the organ was built by Bevington. Of late years it has been known as "Gordon's chapel," as the late General Gordon sometimes conducted the services there.

The Mechanism of the Electric Arc.

THE able paper recently read by Mrs. Ayrton to the Royal Society on "The Mechanism of the Electric Arc" will be welcome to electricians, as it proves that all the main phenomena connected with the burning of the electric arc can be accounted for by the ordinary electrical laws. There is no need to make the supposition that the arc has a negative resistance or that it is the seat of an electromotive force. Mrs. Ayrton has found that the arc consists of three parts—a thin layer of carbon vapour issuing from the end of the positive carbon, a bulb of carbon mist joining it to the negative carbon, and a sheath of burning gases formed by the burning of the mist and the hot ends of the carbons and surrounding both. The flame was found to be practically insulating, so that the important result follows that the current flows through the vapour and mist alone. If we suppose that the resistivity of the vapour is much greater than the mist, then the high temperature of the crater would be explained. The pointed shape of the negative carbon is caused by the tip being protected by mist, and its sides are burned away by radiation from the vapour film. The theoretical explanations of the sudden drop of pressure in getting from the positive carbon to the arc, and also of the sudden drop in pressure when the arc begins to hiss, easily follow. Professor Ayrton, some four years ago, was one of the strongest supporters of the negative resistance theory, which his wife has now proved to be erroneous. Still, even an erroneous theory, when it has some foundation, may be valuable, as it may suggest new experiments and lead to valuable results. For example, the negative resistance theory, now proved to be wrong, led to the discovery of the musical arc and a commercial method of obtaining alternating currents of high frequency from the ordinary direct current mains.

The Proposed Mono-Rail Railway.

THE advocates of the new Mono-rail high-speed railway are trying to refer its opponents to the parallel case, as they consider it, of the opposition made to the first railways on the ground that it was dangerous and unhealthy for people to be hurried along at the rate of twenty miles an hour. But are the cases quite parallel? The objectors to the

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twenty miles an hour railway were foolish even from the point of view of that day, for they might have reflected that people could ride a galloping horse at that speed without suffering from the effects. But the human body is, after all, a delicate machine, and there must be some limit to the speed of transport which it will endure without ill effects. We do not know how near we have come to the limit, but we know there must be a limit. Then there is also the balance of risks and advantages to be considered. However ingeniously the mono-rail railway may be planned and however carefully constructed, no human means can guard absolutely against the chances of accident from some unforeseen cause; and the consequences of an accident at the rate of speed proposed are fearful to contemplate. Is there any advantage in covering the ground at that speed which balances the risk? That is the point for future mono-rail travellers to consider.

St. Helen's, Isle of Wight.

In reference to a "Note" in our issue of the 10th inst., touching on the sanitary condition of the Urban District of St. Helen's, Isle of Wight, we have received a letter from the Clerk of the District Council in question, complaining that we have done them an injustice in not mentioning what was stated in Dr. Bulstode's Report, that "the Ryde water will shortly be in use over the whole of the St. Helen's district," and stating that the water main was, at the time of Dr. Bulstode's visit, being laid into the village of St. Helen's, and that many of the houses have since been connected. We are glad to hear it, as experience shows that in many such cases promises of this kind are very much delayed in execution. Our remarks were based on the expert Report to the Local Government Board, which may be taken to be an impartial document written only in the public interest; and it must be observed that in spite of the reference to the intention to lay on water to St. Helen's, the Report included, in a later paragraph, the sentence which we quoted, that much had to be done before the district could be said to be modernised in a sanitary sense; and in the same sentence it is added that "no time should be lost in dispensing with the very unsatisfactory source from which St. Helen's was supplied at the date of my visit. Efforts should be made to close the remaining shallow wells in the district." It is clear from this and from various other sentences which space does not allow us to quote, that the local Government Inspector considered the sanitary condition of the district very unsatisfactory, both in respect of circumstances and administration. Our object in quoting and referring to such Reports is not to cause annoyance to local officials, but to strengthen the hands of the Local Government Board in their contest against unsanitary conditions and slack administration.

Public Improvements, Sunderland.—At the Town Hall, Sunderland, on the 16th inst., Mr. A. A. G. Malet, Inspector for the Local Government Board, held inquiries into the applications of the Sunderland Corporation for sanction to borrow 20,000*l.* for the purchase of the Victoria Hall and certain lands adjacent thereto, for the renovation and alteration of the hall, and for the erection of additional buildings in connexion therewith; 3,290*l.* for the purpose of electric lighting in certain public streets; and 11,000*l.* for the reconstruction and extension of the public baths in Hendon-road. The Town Clerk (Mr. F. M. Bowey) stated the case in each instance.

GLASGOW EXHIBITION:

FURTHER NOTES ON MATERIALS.

Scotch fireclay goods are well represented in the Exhibition. Messrs. Peter & Mark Hurll, of Gartliston and Garnqueen Works, Glenboig, have a general exhibit of fireclay articles on a stall near the end of the Grand Avenue, not far from the Machinery Hall. These are all light brown in colour, with small specks of black; there is a good assortment of tiles, arch-bricks, perforated bricks and slabs. A special feature is a full-size gas retort, as used in the Glasgow Corporation gasworks; it is 9 ft. in length by 21 in. by 15 in. inside. An enormous siege block for a plate-glass furnace shown, has the following dimensions: 5 ft. 2 in. by 3 ft. 3 in. by 14 in. to 12 in. The chemical composition of the Glenboig raw fireclay, as given on this stall, is:—

Chemical Composition of Glenboig Fireclay.

Silica	56·70
Alumina	38·52
Oxide of iron	2·15
Titanic acid	·76
Lime	·80
Magnesia	·19
Potash	·41
Soda	·47
	100·00

The above analysis is by Messrs. R. A. Tatlock Readman, & Thomson. Peculiar features are the small proportions of lime and alkalies, and the presence of titanic acid. The proportion of alumina to silica is much higher than in the majority of fireclays, and this, together with the physical structure of the raw earth, doubtless accounts for much of the excellence of the clay for making refractory goods. A raw sample of clay exhibited shows that the earth is blue-black in colour with a slight suspicion of green; it is exceptionally hard and compact.

Near the last stand is the exhibit of the Gartcraig Fireclay Company, Limited, 18, Charles-street, St. Rollox, Glasgow. It consists of fireclay goods and terra-cotta of light buff colour. A conspicuous part of the exhibit is some fluted column pedestals with vases, of the terra-cotta, which were nicely finished and very carefully burned. Other articles shown are chimney pots, bricks (plain and enamelled), glazed pipes, junctions, and sewer bends. There is also a sample of the raw clay, which is of a grey colour. The walls of this exhibit are lined with white, light and dark green, buff, blue, and deep-brown glazed bricks. We were struck by the remarkably uniform tint of all the goods displayed on this stall.

The Glenboig Union Fireclay Company, Limited, of 48, West Regent-street, Glasgow, have a stand in the same part of the Grand Avenue. It contains a good assortment of the company's well-known fireclay goods and glazed pipes. There are arch-bricks, ordinary fire-bricks, perforated slabs, and the like. All the fireclay goods are buff, speckled. The flooring of the stand is of diagonally-channelled blue paviors, all of good, uniform tint.

The Bourtreehill Coal Company, Fireclay Manufacturers, of Salkeld-street, Glasgow (Messrs. R. B. Stewart & Co.), have a large stall, also in the Grand Avenue, on which is arranged a good exhibit of fireclay goods, pipes, &c., including light buff-coloured vases on square pedestals and white enamelled garden tiles.

The North Devon Clay Company, Limited, in connexion with an exhibit of Messrs. Chubb & Sons' fireproof safes, show samples of "special ◇ brand" impervious stoneware bricks, manufactured at the Marland Stoneware brickworks. The bricks are hard, white, and smooth, slightly speckled, and are suitable for strong-rooms, vaults, &c. The samples exhibited are made up as sections of brick walls for strong-rooms.

Messrs. F. R. & C. H. Luke & Co., of West George-street, Glasgow, show, in addition to building stones mentioned in a previous article, red facing bricks made by the Huncoat Brick and Terra-Cotta Company, Limited, of Accrington, as well as panels, moulding bricks, &c. They are all of fine, uniform red tint. We are informed that about two millions of these bricks are being used in connexion with the Granton Gasworks contract, under the Edinburgh Corporation.

There are some samples of blue vitrified Staffordshire goods, such as blue glazed bricks, channels, paviors, and stable bricks, made by Messrs. Peter Wood, Limited, of West Bromwich, Staffs. A chemical analysis of the raw clay employed is given as follows:—

Chemical Composition of Clay, West Bromwich, Staffs.

Insoluble residue (quartz and felspar)	33·38
Combined silica	27·33
Alumina	16·73
Ferric oxide	6·57
Ferrous oxide	3·38
Manganous oxide	·34
Lime	·39
Magnesia	·86
Potash	·75
Soda	1·06
Combined water, organic matter, and loss	9·21
	100·00

The insoluble residue was found to be made up as follows:—

Quartz	27·96
Combined silica	3·77
Alumina...	1·07
Lime	·05
Magnesia	·01
Soda	·52
	33·38

This analysis, by Messrs. Stanger & Blount, is one of the most complete quantitative results on a sample of clay we have ever seen. It enables one to judge at a glance the proportions of combined and uncombined silica as compared with alumina, and it separates the higher and lower iron oxides—very important points, guiding the manufacturer in getting the best results in the burning operations. The proportion of iron is rather high, but acts as a good flux to the silica and alumina; whilst the alkalies, though satisfactorily small in amount, are also to some extent fluxed in the same way. We learn that the bricks are burned at a temperature of about 2,372 deg. Fahr.

In the Machinery Hall several kinds of raw clays and finished bricks, both plain and glazed, are shown in connexion with brick-making machinery by Messrs. Thos. C. Fawcett, Limited, Hunslet-road, Leeds.

In the Irish pavilion there is some fireclay from Ballinamore, co. Leitrim, found in association with black clay. No particulars were forthcoming at the time of our visit.

In addition to the above clay-working exhibits, there are several other stands in different parts of the Exhibition, on which tiles, drain-pipes, &c., in connexion with sanitary goods, are shown; these have already been described (see p. 50 *ante*).

Cements in a raw state are not conspicuous in the Exhibition, and we have nothing to say concerning them, though we saw a few from Canada and elsewhere.

Timber is in evidence in various sections, especially in those devoted to British colonies. With few exceptions, however, they are in the nature of museum specimens, and refer to woods which are, at present, of more interest to botanists than to architects. In the Western Australia section the hard red woods of the country are admirably displayed, principally polished as table tops, balusters, &c., and the various objects are seen to better advantage than they were in the miserable little building at the Paris Exhibition, where rough and worked samples of the woods were also shown, though few were identical with those at Glasgow. Several specimens of Canadian timber are exhibited. The principal woods are the white or Weymouth pine, formerly the principal kind of timber exported from the Dominion; the red pine, a rather resinous variety, and not so much in use as the preceding; the white fir, which does not grow to the same size as the pines, the black fir, red fir, white cedar, aspen, basswood, cypress, and the birch. The annual yield of the forests of Canada is upwards of 33,538,000 standard logs, each having 100 ft. board measure. The total value of the raw products of the forests is over eighty millions of dollars. Rhodesia contributes several interesting varieties of timber in the British South Africa section, which timber will doubtless prove more interesting to British architects as the country becomes more fully developed. There is a large building out in the grounds devoted to the exhibition of Russian timber and general forestry

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works. Speaking generally, there is an absence of information in the Exhibition in regard to these extra-British timbers. It is not sufficient for practical purposes to merely give the Latin name and the locality whence the specimens come; that is all they do in most museums. An Exhibition is not a museum, and the visitor ought to be provided with sufficient information regarding specimens, either in connexion with the specimens themselves, or in the official catalogue. The latter, however, is practically a useless publication, except for the block plan of the exhibition it contains, and that would be better were it more detailed and on a larger scale.

RECENT PROGRESS IN ARCHITECTURAL DESIGN IN THE UNITED STATES.

THE following paper was read by Mr. Walter Cook, F.A.I.A., at the thirty-fourth Annual Convention of the American Institute of Architects, and is printed in the report, which we have just received, of the proceedings of that Convention:—

"Another observation," writes Professor Langford Warren, in his very interesting little essay prefixed to the catalogue of the Boston Architectural Exhibition of 1899—"Another observation which has forced itself upon our attention during the last two or three years, is the marked growth of distinctive local character in the architecture of our principal cities. This may be regarded as decidedly a hopeful sign—a sign of wholesome and natural life and vigour. Chicago, New York, Boston, and Philadelphia, while all have improved, differ from each other in their architecture in a way they did not a few years ago." How true this observation is, I have had many occasions to remark; and any one who has had the opportunity, as most of us have had, to make flying visits to other centres of architectural activity than his own, must have been not only struck by the distinctively local character in the newer buildings of which Professor Warren speaks, but also by the slightly exotic appearance of some of them, which, on investigation, proves to have been conceived in other cities and under other influences than those of their State. It is these differences which make it dangerous for any one who has not been able to study them more carefully than I have, to speak on the progress of architectural design except from a local standpoint; and I must depend on others to correct me when any general conclusions have been unduly affected by the narrowness of my horizon.

In former times, writers on architecture have always endeavoured to explain changes of style from one period to another by referring them to general changes in the civilisation of the countries effected—by modifications in the lives of the people and their modes of thought—or by changes in the materials used or the constructions adopted. These are of course generally gradual although constant in their operation, and only to be seen distinctly when different centuries are compared. For instance, the Gothic development was largely the result of constructional necessities, as the architects of the day understood them, as well as of certain changed conditions in the lives of the people and their history; while the comparatively rapid development of the Renaissance in architecture was entirely coincident with the extraordinary revival and popularisation of Greek and Latin learning and of Classic ideas as they appeared to the Italian mind of that period, and was not all due to any new conditions of materials or structure.

In our recent development it is quite possible to see, even in the course of a very few years, the same kind of influences at work—the changes in the temper, the needs, and the desires of our clients, as well as the changes in the materials used and in the constructions adopted; and as our different cities do not advance on strictly parallel lines in other respects, it is quite natural that this should also be the case in their architecture. The unity of language and political institutions, the constant interchanging of our population will certainly prevent any great radical differences; but such variety as we see existing in Europe between two modern cities has already begun here, and bids fair to become with time more rather than less marked.

Any consideration, however, of the causes of our progress in design would be most incomplete which failed to take account of the direct influence of the architects. The tendency of the historians of our art, more than any other, has been to consider the architect as the more or less unconscious agent in the general forward movement of the world, whose style was an inevitable consequence of some unseen power which urged him on in spite of himself. It is, perhaps, on account of this view that the names of so many of our great masters are quite unknown to the general public and far less known than should be the case even in our own ranks. Whatever the truth may have been in the past—and I am not now pleading the cause of individual genius—it is quite certain that to-day and in our country the style and character of a building often proceeds directly from the individuality, the traditions, and the education of the architect rather than from any general trend of the artistic and intellectual ideas which surround him. Never in our time has this been so true as it is at the present moment, and one is tempted to say that much of the architecture of the present day has been rather imposed upon the community by the architects than imposed upon the architects by the community. For instance, our domestic work in New York has broken radically away from the tradition of the high-stoop brownstone house, and this only because the architects took the initiative of a better plan, and persuaded the client that it was a better one.

All these causes, then, change in the general ideas and conditions, constructive necessities, and the initiative of the architects, are responsible for the recent advance in design. It is to the last-named and to the far better artistic education of the architects of to-day that is due a great and notable improvement in the study of both ensemble and details in most of our recent buildings. Nor is this true only of the work of the better-known men. In a great deal of the work where there is no real architect at all, the better influence is felt to some degree. Even those speculative structures which cast so much unmerited discredit upon us in the mind of the casual visitor to New York, even these are distinctly better than the same buildings were ten or fifteen years ago, and reflect, however dimly, quite unmistakably our real architectural work.

The tall building with its skeleton construction which some of us are fortunate enough to design, and the existence of which nearly all of us deplore, is the result of constructional necessity. Far be it from me to enter here into any discussion as to its future development. In no kind of work are we so much at sea. We try an excess of sincerity and are appalled at the resultant ugliness; we decorate our sincerity first at the bottom, then at the top, then all over, and are still wondering which is the best. We are confronted with the problem of a tower, mostly windows, with two or three blank walls which may be covered up any day by an adjoining building, and are tempted to say with the prayer-book that there is no health in us. Few of us think that an absolutely successful solution has been reached, and yet few buildings are more interesting to study on account of the many earnest and skilful attempts to solve the problem. Look at Mr. Sullivan's buildings, with their strong individuality and local character. One of them stands in New York and shouts tidings of Chicago to us as one preaching in the wilderness, and still we wonder and admire and are unconvinced. Then there is Mr. Reid's building in San Francisco, one of the most successful I know, and Mr. Bruce Price's and Mr. Eidlitz's, and a score of others. But as soon as we begin to talk about them we are involved in such a quantity of theories of all kinds and descriptions that we are apt to forget that after all material conditions are filled there is really only one paramount question—how far are they beautiful? Given the almost impossible conditions of the problem, and it seems to me that there has been a steady progress towards better and more harmonious compositions; and yet—and yet it is impossible to feel certain what is the true path. The temptation to the strange, to the unusual, to the grotesque even, is great; may it be that through much tribulation we may enter into the kingdom?

It is a comfort to turn to our domestic work, in which Americans have so long since achieved a large measure of success. In no field has this success been so well maintained as in our city and country houses, and this is apparent wherever you may go, east or west, in all its varied manifestations. The differences of development in different places is not only very marked, but a constant source of entertainment and interest. I defy the architect from Boston or New York to see without lively pleasure and sense of novelty the work of the group of men who have done so much in Philadelphia for their city and their art; and this is only one example. Wherever we turn we find evidences of increased study, of greater ambition to do the good thing, of greater knowledge of the good traditions, and a more educated if less slavish adherence to them.

"Good Americans," said Dr. Holmes, "when they die, go to Paris." We have to some extent changed this. To-day a great many good Americans, a great many rich Americans, especially, come to New York to live long before they die; and so it has become not only the commercial metropolis of the East, but the abiding place of a large population, partly New Yorkers, partly from other States, who have plenty of money, plenty of leisure, and the chief business of whose life is amusement. In this life of leisure and amusement the house is the greatest element; receptions, dinners, dances, take place there, and it is the visible sign of the wealth, the social position or aspirations, and the tastes of the owner.

This is, I think, why the New York house, that is the most *en évidence*, is the one planned with a special view to entertainments, and why our house architecture seeks to express it outside and inside. It is one of the cases where a change in the ideas and desires of the client has been the greatest influence at work; just as similar changes in ideas were instrumental centuries ago in determining the character of Venice. It is easy to see from this point of view why what is called the American basement plan has been almost universally adopted; for this plan, with all its other advantages, gives the greatest available space to the rooms devoted to entertainment, and yet originally it had to be almost forced upon the conservative clients, who could imagine nothing except the traditional high stoop.

Another thing which has influenced our particular city architecture has been the practical abandonment of the red pressed brick which used to be the conventional standard of respectability and elegance, and for whose disappearance we can hardly be too thankful, and the very general use of light-coloured stone, especially of Indiana limestone, which invites to a greater elaboration of design and detail.

These various determining causes have resulted in a great number of houses which are to me very full of interest. New York is becoming more cheerful, gayer, and brighter in its aspect, and there are more evidences of study and individuality in a single street to-day than in a whole quarter formerly. To those who know the city the neighbourhood of 54th Street, with the imposing building of the University Club as a centre, will serve as an example of what I mean.

It is, however, always useful to see ourselves as others see us, or even as one other sees us, and so, with apologies to Professor Warren, I will quote him once more:—

"In New York," he writes, "the influence of the Ecole des Beaux-Arts is paramount in much of the work, often even to the sacrifice, if not of local, of national character, so that many buildings look as if they had strayed from the Boulevards of Paris. Though we may regret this wholesale importation, this direct imitation, with all its mannerisms, of a style which is full of bad taste and solecism, in spite of the strength in plan and mass of its originators, it does seem to express New York, and it certainly has been acclimatised there and is affecting nearly all its work, while it has received but little welcome in other parts of the country, so that this direct Parisian influence has come to be peculiarly characteristic of New York and may possibly be the starting point of a local manner of building. Lavish display, richness of effect, characterise most of the work and express the luxury-loving New Yorker."

I confess to have read with mingled feelings this blast of doctrine from the precincts of ascetic Boston. Is it true that we have a wholesale importation of style which is "full of bad taste and solecism?" I think Professor Warren has allowed himself to draw too sweeping conclusions. It is a fact that the influence of the Ecole des Beaux-Arts and its pupils has been a strong one. But this influence has been principally felt in the methods of study, and not in the introduction of certain forms, and more powerfully in the study of plan than in any other way. It has done much

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to persuade us that there is such a thing as beauty in its arrangement, and not merely convenience—to teach us that there is such a thing as a beautiful plan; and it is not so very many years ago since the idea that there could be such a thing was ridiculed.

As to the adoption literally of French motives, which Professor Warren characterises so frankly and with so much authority of tone, I think we need not be alarmed. It is rational and eminently proper that the young architect—and most of the Beaux-Arts men have that inestimable advantage—should pretty accurately reflect his teaching (if it has been good for anything) at the beginning of his career. Raphael in his first stage was a close imitator of Perugino. But as he progresses his individuality asserts itself, the changed conditions and surroundings exercise their unconscious influence, and he is himself in spite of it. It may be that the school work is to be the foundation of a special New York architecture; but it is certain that in that case the results will not be a series of copies.

Whatever may be the case, however, in the future, as yet the influence of the Ecole can hardly be called paramount in New York. McKim, Mead, and White, and their now numerous architectural progeny are not under the baleful spell, as Professor Warren considers it; Mr. Hardenbergh, Mr. Eidlitz, Mr. Robertson, and a host of others whom it would be too long to catalogue are untouched by the poison. It is a source of strength to us that our architects are divided into a number of separate groups by a process of natural selection, each working in different ways, each influenced unconsciously by the others, but preserving its own individuality. I imagine this to be the case in most of our architectural centres, and I hope it may never happen—I am sure it will never happen, that we shall all serve the same gods in our designs.

Before leaving the city house some mention should be made of the interiors, to which an increased care and study have been given of late, when they have not fallen into the hands of our common enemy, the commercial decorator. The best work which has been done in this field will, it seems to me, compare very favourably with any done in the world at the present time. There is still often too great a desire to conform to some given style; but the habit of making a house a sort of architectural encyclopædia, with an Empire room, an Elizabethan room, a Colonial room, a Moorish room, is on the wane, I think, and one is more often struck with appropriateness and beauty than with historic parallels.

It is hardly more than twenty-five years ago that we began to design country cottages by the seashore or in the mountains for the city family to spend two or three months in during the summer. At first they were cottages indeed, little more than a more convenient version of the farmhouse which preceded them, and following closely its simple style, with here and there a Norman or an English reminiscence added. As the taste for country life, or, perhaps, rather life in the country, spread, these cottages grew in size and importance year by year till it became quite ridiculous to call them cottages. Still the same traditions were potent, and we saw country houses, manors, châteaux—call them what you will—of great size, masquerading as overgrown cottages, with huge shingled gables, shingled towers, and an attempt at a certain elephantine picturesqueness.

This was the epoch when, Mr. Russell Sturges mournfully tells us, the only real American contribution to architecture was made, and when American architects still designed—the golden age between 1880 and 1890. Now, the *laudator temporis acti* has been a familiar figure ever since Nestor compared the besiegers of Troy to their mighty ancestors; and we are pretty well accustomed to hearing of the superiority of our father's deeds to our own in all the arts of war and peace. But it is a somewhat novel experience to hear how much better we, ourselves, were ten or fifteen years ago than in our present decrepitude; and it is worth while questioning whether we have really fallen short of the high standard we ourselves set.

Of course, there are many real country cottages still built, and in many of these Mr. Sturges's ideals are still followed, not less successfully than in the past, I think; with many interesting experiments in other directions, like Mr. Atterbury's semi-oriental houses on the south shore of Long Island. But the country house of our day is continually assuming greater importance, not only in Newport and in Lenox, but all over the country. It is often a great establishment, rivalling, if not surpassing, in importance the town house, and lived in for half the year instead of a few summer months. For these houses we have drawn our inspiration from those of similar importance in our own and other countries. The large Colonial houses, especially those in the South, have been studied and freely imitated; England and Italy have furnished us types; but all of these have been so modified and changed that the result is in no way a literal imitation. We are in a fair way to have a great variety in our stately country places, and I, for one, do not fear they will suffer by comparison with their predecessors. The question of their setting and their surroundings becomes one of great importance, involving, as it does, all the problems of landscape gardening; and it is most necessary that the general designing of these features should be under the control of the architect, however needful it may be that he should take expert advice in certain details.

In our public buildings a new era has opened, thanks to the intelligent interests and sympathy which we have learned to expect from Secretary Gage, and to the general awakening of interest in good architecture all over the country. It is due to these causes that the custom-houses in New York and Baltimore and other of the more important Government buildings have been put into hands which may well assure us that they will be far in advance of their predecessors, and that the New York Public Library and the State Capitols of Minnesota, Rhode Island, and Washington have become objects of architectural rather than political interest. It is with impatience that the results of this new era will be awaited, for it is as yet too early to draw any general conclusions about tendencies in the matter of style. In the consideration of public buildings, however, it is of interest to note the beginnings of an idea of fixed types. The State capitol is beginning to be understood as a building with a dome; perhaps following the lead of the National Capitol at Washington. My attention was drawn to this by a criticism I heard of one of the designs submitted in the competition for the Providence Capitol — a non-professional criticism. The design in question had a cupola somewhat like that of the Paris Hôtel-de-Ville, and my critic said quite decidedly that the building didn't look to him like the capitol of a State because there was no dome. I have heard the same thing since, and it would seem as though one feature of our State houses was in a way to be almost taken for granted.

I hardly know of any other instance of a fixed architectural type in this country, except, of course, the ecclesiastical one, which seems to be pretty firmly implanted in spite of some very notable exceptions. As a rule, the moment we turn our faces to the religious problem we become, or try to become, mediæval, and that without much regard to the traditions of the particular sect who are to worship in our temple. In much of this work there are abundant evidences of care and knowledge. The results seem to me generally more successful in the country than in the cities. But these results are so special in their character, so unconnected with the general architectural movement of the day in other fields, that they can hardly be considered with them, but should rather be the subject of a separate paper. In church building we express ourselves in a different architectural language than the one we use every day; as in the Catholic Church the service is in Latin, and not in a tongue "understanded of the people."

The important buildings recently erected or projected for the University of Pennsylvania, Columbia, Yale, Princeton, and Harvard, as well as those designed for the University of California and Washington University in St. Louis, show quite varying tendencies in our college architecture. Harvard, in the Philip Brooks Building, the University Club and the Architectural Building, returns in a great measure to her own Colonial traditions, and most naturally and wisely. Elsewhere there seem to have been no local traditions powerful enough to influence architectural style. Accordingly at Columbia we find the strong personal note of the architects, dignified, correct, and, notably in the case of the library, imposing. Princeton and the University of Pennsylvania are to be strongly reminiscent of certain of the English colleges, and St. Louis is to follow in their footsteps, while New Haven is to have a memorial hall which will be a total departure from anything there at the present time, and whose materialisation is to be awaited with the utmost interest. In California, where there are no traditions, except those of a population which has ceased to exist, the most important general scheme ever made for a university, the entire realisation of which neither we nor our immediate successors are to see, has been adopted, and is now in process of further study and elaboration by M. Bénard, who has all our best wishes; and it is indeed an epoch in our architecture when Berkeley and St. Louis both recognise that the random and haphazard arrangement of college buildings which has prevailed in the older colleges is not the ideal way to proceed to-day.

No survey of the current architecture of the time and its tendencies of style can be otherwise than an incomplete sketch, without far exceeding the limits of a paper to be read before you. But I have said enough to show you how hopeful I think the outlook is. It is true that many bad things—things which all of us, wherever we believe the truth lies, recognise as bad—are still built, and that what used to be known as the Peorian style (doubtless with great injustice to that city) is not yet entirely dead. But it is just to look at the best, the most representative buildings, rather than their weaker companions; and in these I see little that is not encouraging.

The newer architecture has, it is true, its foundations in a more complete knowledge, a more thorough comprehension of the best that has been and is done in other countries; but we are too genuine Yankees to be able to imitate blindly, even if we wished to do so; and I know few examples, if any, where the distinctly indigenous character is not apparent. To those who are impatient for novelty, who demand an American architecture as they used to demand an American novel, who proclaim with alliterative enthusiasm the doctrine of "progress before precedent," I would recall the sentence quoted by Thomas Bailey Aldrich in one of his essays—"Nothing but mediocrity is ever wholly original."

The paths taken by us are widely different, and yet, in a way, they all lead to Rome. We are as far as ever from being of a mind as to which is the only true one, although each of us is privately convinced that he knows it. In these individual convictions and differences lies much of our strength. Like the ship on the shield of the city of Paris, our architectural ship is rocked hither and thither, but never sinks—*Fluctuat nec Mergitur.*

ARCHITECTURAL SOCIETIES.

Leeds and Yorkshire Architectural Society.—On the 15th inst. an afternoon visit of this Society was made to Wheatfield Lodge and Castle Grove, Headingley (by permission of Mr. Joseph Nicholson and Mr. John Kirk, J.P.). Wheatfield Lodge, Wood-lane, has undergone alterations and additions from the designs of Mr. Butler Wilson, F.R.I.B.A., who was also responsible for the decoration, furnishing, and upholstering of the following apartments:—The hall, the staircase, the gallery, the dining-room (28 ft. by 21 ft.), billiard-room (35 ft. by 21 ft.), and the stables, where accommodation for six horses and carriages is obtained, with hospital, harness-room, hay-chamber, and the necessary offices. At Castle Grove, Moor-road, Headingley, which was also visited, considerable enlargements have been made under Mr. Butler Wilson, who was also entrusted with the various schemes of decoration, furniture, and upholstery in the salon (31 ft. by 29 ft. by 26 ft. high), the dining-room (32 ft. by 20 ft. by 15 ft. high), the billiard-room (37 ft. by 18 ft.), the drawing-room (36 ft. by 15 ft.), and the staircase hall (16 ft. by 14 ft. by 45 ft. high).

Street Improvements, Lincoln.—On the 16th inst. Colonel A. J. Hepper, D.S.O., R.E., Government Inspector, held an inquiry at the Guildhall, Lincoln, on the subject of the application of the Lincoln City Council to borrow 4,650*l.* for purposes of street improvement. The Corporation was represented by the Deputy Town Clerk (Mr. W. T. Page), and amongst others present were the City Surveyor (Mr. R. A. MacBrair) and the Electrical Engineer (Mr. Clegg).

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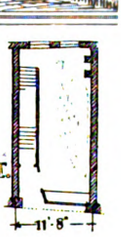
A NARROW FRONT IN THE STRAND.

T·BATTERBURY·F·R·I·B·A·ARCHT



A NARROW FRONT IN THE STRAND.

WE published elevations and details of this bit of work as a plate in our issue of February 10, 1900, with a short description.

The perspective shows better the effect of the bay. The architect is Mr. T. Batterbury.

THE BUILDING TRADE AND THE HOUSING QUESTION IN GERMANY.

MR. CONSUL-GENERAL FRANCIS OPPENHEIMER, of Frankfort-on-Main, in a long special Report respecting the commercial set-back which is being experienced by Germany (a set-back which, though it may last some time, he thinks will not become sufficiently acute to terminate in a crisis), explains that in the middle of the nineties, when the general tendency of trade was rising, the rate of interest advanced, and reached in 1899 the abnormal height of 7 and 8 per cent. As at this juncture investments in Government stock proved unprofitable and even insufficient for those who wished to save money, the investors with their ready cash bought industrial values, and even sold Government stock, to effect a change in their investments. Such a step, of course, affected the quotation of Government stock, so that its holders, beyond an insufficient income from this source, experienced an actual loss of capital. In consequence, industrial values continued to increase in favour with the public, and for years so much money was devoted to industrial investments that industry was thereby enabled to extend itself considerably. When all available cash had been swallowed up by the industrial high tide, and loans on account of the increased risk could only be had of professional lenders at a higher premium, the high rate of interest which followed could not long be borne without serious consequences. The building trade was the first to suffer. Granted even that the need for extended accommodation in the towns still prevailed, builders were stopped in their activity by the impossibility of raising mortgages at a rate which would still leave them a margin for profit. This caused the first interruption in the continued industrial development. It affected in the first instance all works connected with the stone, sand, mortar, and cement trades, and further the iron, glass, and wood trades. It also put a stop to the extension and rebuilding of industrial works generally, which had been taken as an outward sign of the firmness of the industrial market, and by which industry had considerably increased the general demand as self-consumer. This first set-back was intensified by the high prices prevailing. They had been fixed during the days of unparalleled prosperity by the syndicates, who seemed most disinclined to grant any reduction. Contracts had been made over prolonged future periods, and consumers were bound to pay high prices in future in spite of the changed circumstances. People well qualified to form an opinion frankly declare that at this moment syndicates failed in practice to bestow all those benefits which for times of trouble had in theory been expected from them, and that their power and consequent influence on the market became for the time being an evil rather than a blessing. The scarcity of dwellings, which of late has become a very serious question throughout Germany, is undoubtedly due in the first instance to the rapid increase of the population and the temptation for peasants during times of industrial prosperity to flock into towns. The demand for dwellings was furthermore increased by the fact that the higher wages earned enabled different families, which had hitherto shared one dwelling, to separate There were local reasons, too, which led to an increased demand. Thus, owing to the compulsory early closing on week-days and the closing of shops altogether on Sundays in many towns, families which had so far been satisfied with inferior accommodation, because the whole day and all days had been spent in the shops, desired better dwellings for their leisure hours. In some towns, again, there has been a decided slackness in the building trade, or a disinclination to build houses and small dwellings, because the excessive price of sites prevented such enterprises from being regarded as lucrative investments. The professional builder, moreover, knows that houses split up into small dwellings are difficult to manage and difficult to sell. This want of accommodation would undoubtedly have been felt even more acutely throughout Germany had not certain classes of the population been "housed" by their employers. Thus the Government has in some towns provided accommodation for those it employs (*e.g.*, for railway officials); some municipalities have supplied accommodation for those employed in municipal works (*e.g.*, gas factories). The proprietors of large factories have long since built workmen's dwellings in connexion with their factories. But even this system, it has been pointed out, is not altogether satisfactory when there exists a real want of small dwellings; for the scarcity of the dwellings certainly enhances the influence the employer can bring to bear upon his employee who is also his tenant. Among the lower classes of the population, no doubt, the artisans are best supplied with accommodation, but there are many of the same financial standing whose wants so far have

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been ignored except in the few cases where private generosity has come forward to reduce the calamity. To-day all are agreed that the state of affairs calls for serious general remedies. Some suggest that matters might be considerably improved by an efficient official inspection (and consequent improvement) of the accommodation which already exists; some claim a reform in the building laws with a reduction of the rates and taxes levied upon buildings with small dwellings, whereby such enterprises would hold out the temptation of fair investments; others, again, want a more systematic development of the means of communication, whereby land outside the towns could be usefully acquired for the building of cheap dwellings. One suggestion which enjoys particular favour invites the Town Committees to acquire extended areas, which are to be let to building societies on long leases, with the proviso that the buildings to be created are to supply the much-needed dwellings. This suggestion has become possible only since the introduction of the new Civil Code, which has legalised (since 1900) long leases. Another suggestion goes a step further. The town communities, after acquiring the extended areas, are themselves to build the dwellings, for which reasonable rents would then be assured, as the community need make no profit, and only charge interest on cost and outlay by way of rent. This course, however, though it appears attractive at first sight, would undoubtedly meet with difficulties in municipal administration, and is open to the objection that the community thereby enters into competition with certain owners who pay house taxes, &c. The want of dwellings has, for a number of years, been more particularly felt at Frankfort, where the average annual increase of the population has amounted to about 6,500. Owing to local reasons, it has so far been an absolute impossibility to build the necessary additional accommodation. In the beginning of 1900 the whole community of Frankfort (*i.e.*, Greater Frankfort) covered an area of 8,014 hectares, out of which only 740 hectares were available for building purposes, and these were so split up and divided, and so unfortunately situated, that they were useless as building sites, and the mapping out of new streets was impossible. A Bill, therefore, was laid before the Prussian Diet, and will shortly have the force of law, which for the first time applies to sites in a township the idea of "pooling" which is common in rural districts, where great distances between properties owned by the same person would materially interfere with a cheap working of the soil. All properties in a district are thrown together, and each proprietor receives one continuous block of land, which, after careful calculation, represents the value of the divided old ones he held. By the Bill referred to, "Lex Adickes," so named after the Mayor of Frankfort, the sites are to be "pooled"; the streets are to be drawn out first, and the remainder is to be divided among the former proprietors of the various parts, with—in some cases which call for special compensation—a sum of money added. The measure has been so framed that although in the first instance it is only to apply to Frankfort, its application may be extended to any other town in Prussia if the working of the scheme is found to be practicable.

COMPETITIONS.

Cemetery Chapel, Bexhill.—The following is the result of the competition for a Cemetery Chapel, Bexhill:—1st premiated design, Mr. W. H. Allon, Bexhill; 2nd premiated design, Messrs. Crickmay & Heath, London; and 3rd premiated design, Mr. F. W. Richardson, London.

The Student's Column.

GAS AND GAS FITTINGS.

8.—Consumer's Meter and Service Pipes.

Consumer's Meter. — The consumer's meter may be of either the "wet" or "dry" description, but the "dry" meter is now almost universally employed. Fig. 13 shows a wet meter in section, and fig. 14 a dry meter. The wet meter is constructed on the same principle as the station meter previously described.

The dry meter has a case of tinned iron divided into compartments by a central partition, and two or more movable diaphragms having flexible leather sides. The gas enters and leaves the compartments alternately through suitable slide valves. The pressure of the gas on the surfaces of the diaphragms causes alternate inflation and collapse of the bellows-like chambers, and, consequently, alternate variations in the area of the inner and outer compartments, and the movements of the diaphragms bring into operation the lever and cranks which actuate the wheelwork of the indicators.

Meters are classed according to the number of "lights" which they are intended to supply, each "light" being supposed to consume 6 cubic feet of gas per hour. Thus a 10-light meter should be provided when the consumption is likely to approach 60 cubic feet per hour, and a 50-light meter when a supply of 300 cubic feet per hour is required. This nominal capacity of the meter does not represent the largest quantity of gas which can be passed through the meter under ordinary pressures, but the meter should not be required to perform more than its nominal duty. The *prepayment meter*, also called the *coin meter* or the *slot meter*, is an ordinary meter having attached to it a box with a slot in it. When a penny, or any other coin for which the meter is provided, is dropped through the slot a certain quantity of gas is allowed to pass to the burners, and when the pennyworth of gas is nearly consumed, the volume of gas passing gradually diminishes until the flow altogether ceases unless another penny is dropped through the slot. The price charged for the gas is greater than when bought by means of an ordinary meter, because the extra cost of the meter has to be considered. About 25 cubic feet of gas are commonly allowed for one penny, but the quantity varies in different districts.

The prepayment meter first came into use about ten years ago, but it at once became very popular, especially in cottages and workmen's tenements, and there are now about 800,000 of them in use in the United Kingdom alone.

A meter is termed "slow" when it registers less than the actual volume of gas passed through it, and "fast" when the recorded consumption is larger than the amount actually passed through it. A meter which registers correctly at a low pressure would register "slow" if the gas were measured under a higher pressure. By the "Sale of Gas Act" of 1859 a meter is passed as correct when it registers not more than 2 per cent. fast or 3 per cent. slow, the slow registration being in favour of the consumer.

In most large towns one or more meter testing offices are provided and maintained by the Local Authority, which also employs competent and impartial inspectors to test any meter which may be sent to the office for the low fees quoted in the Sale of Gas Act.

The following circular, issued from the Guildhall, London, will serve as an example of the facilities commonly afforded to gas consumers for verifying the registration of gas-meters. The privilege of having a meter, or any number of meters, tested at this low rate of charge is not confined to the inhabitants of the City of London, but is open to every one. The circular runs thus:—

"The attention of the inhabitants of the City is called to the facilities for testing gas-meters:—

I. The Testing Office provided by the Corporation is situate at the City Green-yard, Lower Whitecross-street. Office hours 9 to 5.

II. A gas consumer desiring to have his meter tested should first give twenty-four hours' notice thereof to the gas company. If at the expiration of that time the company have not taken the necessary steps to examine and test such meter, the consumer may do so, the party in the wrong paying certain charges.

III. The charge for testing a 2, 3, or 5-light meter is sixpence, and for larger meters as follows:—

Dry Meters. Lights.	s.	d.	Wet Meters. Lights.	s.	d.
10	1	0	10	1	0
20	1	0	20	1	0
30	1	0	30	2	0
50	2	0	50	2	0
60	2	0	60	3	0
80	3	0	80	4	0
100	3	0	100	5	0
150	5	0	150	8	0
200	7	0	200	10	0

IV. Three days are by the Act allowed for testing, but as a rule a meter can be received back the same day.

V. The consumer can, under special circumstances, have his meter tested on his own premises, but extra cost is thereby incurred.

VI. Any further information may be obtained by applying personally at the Testing Office, Lower Whitecross-street."

Similar testing offices are maintained by the London County Council; one being situated in Westminster, a second in Clerkenwell, a third in Shoreditch, and a fourth in Southwark; and so many meters are sent to these places by gas-consumers and meter-makers that, notwithstanding the low fees charged, the meter-testing offices are found to yield a considerable revenue.

In cases where the suspected meter cannot conveniently be removed, the meter inspector may send a standard meter, known to register correctly, to be coupled to the suspected meter. A quantity of gas is then allowed to pass through the two meters in succession, and if the volume registered by the meters is not identical, the registration of the suspected meter is known to be incorrect. This method of testing, however, entails greater expense than when the meter is sent to the testing office.

When appliances which require a large volume of gas, such as gas fires or cookers, are introduced into a building already supplied with gas, the size of the meter in use must be considered. It frequently happens that a meter which has been fixed to supply "ten lights" or ten burners, each consuming 6 cubic feet of gas per hour, is also called upon to pass the gas required for a ring burner and several gas fires. The result is that the supply of gas throughout the whole building becomes unsatisfactory, the gas-flames assume a miserable appearance, the heating appliances emit very little heat, and complaints are made that the gas supplied by the manufacturer is of very poor quality. The advantage gained by the provision of large and well-laid main service and service pipes may be altogether lost through the use of a meter of insufficient delivering capacity.

The following table shows the nominal delivering capacity of meters of various sizes and the diameter of their inlet and outlet pipes:—

Dry Meters.

Meter. Number of lights.	Diameter of inlet and outlet. Inches.	Delivering capacity per hour. Cubic feet.
2	½	12
3	⅝	18
5	¾	30
10	1	60
15	1	90
20	1¼	120
30	1⅜	180
40	1½	240
50	1½	300
60	1¾	360
80	2	480
100	2	600
120	2½ (Flanged side connexions.)	720
150	3	900
200	3½	1,200
250	3½	1,500
300	4	1,800
400	4	2,400
500	5	3,000
600	6	3,600
800	7	4,800
1,000	8	6,000

Wet Meters.

Meter. Number of lights.	Diameter of inlet and outlet. Inches.	Delivering capacity per hour. Cubic feet.
2	½	12
3	⅝	18
5	¾	30
10	1	60
15	1	90
20	1¼	120
30	1¼	180
50	1½	300
60	1½	360
80	2	480
100	2½	600
150	3	900

Position of Meter.—The meter should be fitted in a place where it will never be exposed to a freezing temperature nor to the direct rays of the sun. Gas when subjected to low temperatures usually deteriorates in illuminating power, and when the meter or service pipe is cooler

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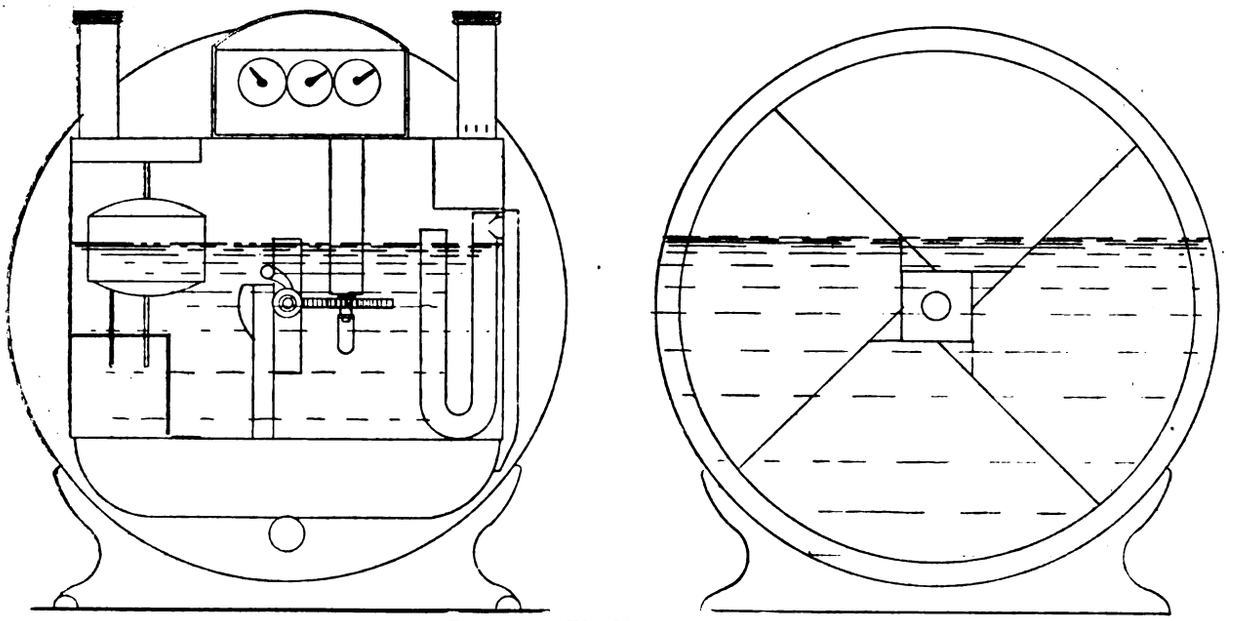

Fig. 13.—A Wet Meter in Section.

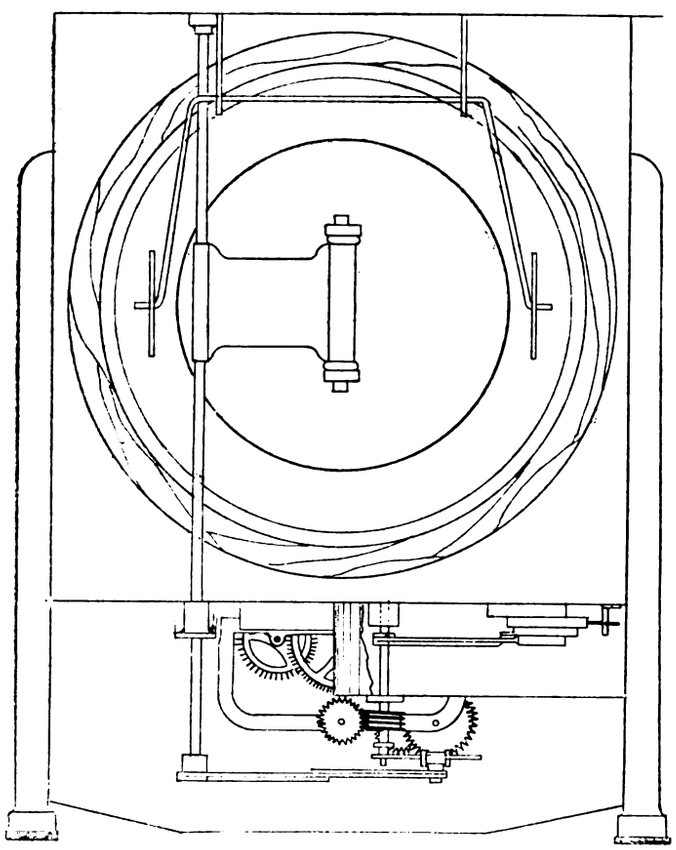

Fig. 14.—A Dry Meter.

than the main service pipe, water is liable to be deposited from the gas and to collect in the pipes and cause "jumping" of the gas flames.

In a dry meter the leather of the diaphragms is liable to stiffen and cease to work properly when the meter is subjected to a freezing temperature, while the freezing of the water in a wet meter would at once put the meter out of action.

Gas expands when heated, and contracts when cooled. A thousand cubic feet of gas measured at standard temperature (60 deg. Fahr.) will be registered as more than a thousand cubic feet if the temperature of the meter exceeds 60 deg. Fahr., and less than a thousand cubic feet if the temperature be below 60 deg. Fahr. It would, therefore, be foolish for a consumer to allow his meter to be fixed in a place where the temperature was maintained at, say, 80 deg. Fahr. As a rule, a cellar is the best place in which to place the meter, for in such places the temperature is usually neither very high nor very low, and is more uniform than elsewhere. The meter should be so situated that it can readily be examined at any time, and should be fitted with its base in a level position.

Service Pipes.—The pipes which convey the gas from the meter to the point of ignition should be of wrought iron. Composition pipe is often used for small services, but is more liable to damage. Gas pipes should never be buried in plaster, for all pipes should be fitted in such position that they can be examined at any time without undue inconvenience. Gas leakages have repeatedly been caused by nails for picture hanging being driven into composition pipes buried in plastered walls.

Where possible the pipes should be run in suitable recesses in the wall, or along the face of the wall, and if regarded as unsightly may be covered with removable casings of wood or any other material. Pipes fitted under the floor boards should be laid with a view to periodical inspection, and not as though they were to remain in position for all time, and the floor boards over the pipes should be screwed, not nailed. Care should be taken that the bore of every iron tube is examined before being laid down, as occasionally these pipes have internal contractions or blisters which greatly reduce their delivering capacities. Mr. Grafton mentions a case in which a very poor supply of gas was discharged from a service one inch in diameter, and after much trouble it was discovered that the failure of the supply was due solely to the fact that one length of pipe had been used in which the bore was constricted for several inches to about $\frac{3}{16}$ of an inch.

All gas pipes should be laid with a fall or inclination, and be provided with siphon-cocks at convenient points, so that any liquid which may be deposited in the pipes may readily be withdrawn.

The following are the sizes of pipe commonly recommended for supplying a number of burners :—

Internal diameter of Pipe.	Length of Pipe.	Greatest number of burners at 5 cubic feet each per hour.
Inches.	Feet.	
½	20	3
¾	30	6
⅞	40	12
1	50	20
1	70	35
1¼	100	60
1½	150	100
2	200	200

The greater the length the greater the diameter of pipe required to deliver a given volume of gas.

Iron pipes are measured by internal diameter; lead, copper, compo, and brass pipes by outside diameter.

BOOKS RECEIVED.

DULVERTON AND THE DISTRICT; HOMELAND HANDBOOKS, No. 12. By F. J. Snell, M.A. (Dulverton: E. Bayley. London: The St. Bride Press, Limited, 24, Bride-street, E.C.)

THE SOCIETY OF LANDED ESTATE AGENTS.—This society has been inaugurated, and its principal objects are: (1) To promote and protect the interests of the profession. (2) To advise by mutual conference on all matters of practice relating to the management of landed estates. (3) To disseminate information by means of publications, correspondence, &c. (4) To watch legislation on matters affecting the interests of agriculture and land generally, and (5) to provide a centre in London for members. A Provisional Council has been appointed, and the secretary (*pro tem.*) is Mr. William Broomhall, 16, Cockspur-street, Pall Mall, S.W. Membership is restricted to landed estate agents, their pupils and assistants.

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Illustrations.

NEW CHURCH, STIRLING.

THIS church, for the Free Church of Scotland, has recently been built from the designs of Mr. J. J. Stevenson. Mr. Stevenson being out of town, we are unable to give other information than that conveyed by the drawing.

"HELNESTOWE," ABINGDON.

THIS house stands on the site of the nunnery of Helnestowe, a mediæval foundation, from which it takes its name. At the time of the alterations the ground was occupied by a malt-house and cottages with sheds abutting upon the river. The sheds were taken down and the malt-house and cottages were gutted; the excellent timber roof of these last forming a feature in what is now the hall. Various pieces of old work were brought to light, including some oak panelling—re-used in the hall—and the traceried head of a fourteenth-century window, which has been completed and now helps to light the drawing-room.

The old buildings supplied much of the required material. The owner was his own builder, engaging and superintending local workmen, with very frequent visits from the architect. This arrangement has answered admirably, and the work has been extremely well done. HARRY REDFERN.

"BRYN HAFOD," KETTERING.

THIS house is situated on a hill on the west side of Kettering overlooking the town.

A Leicestershire pressed brick has been used for the facing, with Ketton stone dressings; the roofs are tiled, and the house is lighted throughout by electric light, which is obtained from a private installation.

The contractor was Mr. George Henson, of Wellingborough, the lead lights and casements are by Mr. George Wragge, of Manchester, and the ceilings by Messrs. Shuffrey & Co., of London.

Messrs. Gotch & Saunders, of Kettering, are the architects.

HOUSE AT PINNER.

THIS house is now in course of erection in the Avenue, Royston Park Estate, Pinner, for Mr. J. H. Shankland. The lower story is of red brick, with arches and quoins of red rubbers; the upper part is finished in white rough cast, and the roof is covered with red Broseley tiles.

Messrs. G. & J. Waterman, of Watford, are the contractors. A. N. PRENTICE.

WEST HAM CLUB AND RESTAURANT.

THE following extract from the company's prospectus will describe the purpose of this building, which is the first of a series intended to be erected in the district:—

"The company has been formed for the purpose of establishing and conducting in the County Borough of West Ham (and elsewhere should it be so determined) club houses and restaurants, and of providing therein refreshments, sleeping accommodation, amusements, and recreation for the industrial classes. There is nothing of the kind in West Ham. A long-felt need exists for large, well-ventilated, healthy, and attractive rooms, in which dinners and light refreshments can be served at popular prices. Such rooms should be patronised largely by those employed in the numerous factories and works in the immediate locality. West Ham is very inadequately provided with hotel accommodation, and constantly men have to return to the City at night who would remain in Stratford were suitable bedrooms available. There is great need for popular, well-lighted rooms, in which men can meet and read the latest news and discuss the events of the day, as well as for rooms in which billiards, chess, draughts, &c., can be played without the surroundings of the public house. It is proposed to encourage athletic clubs, friendly and other societies, to make the establishment their headquarters, and thus ensure a volume of trade and extend the popularity of the house."

The work is being carried out by Messrs. T. H. Kingerlee & Sons, of Oxford, at a cost of about 12,000*l.*, from the design and under the superintendence of Mr S. B. Russell, of Gray's Inn-square, W.C.

Books.

Notes on the Life of Thomas Rickman, F.S.A. Collected by his son, T. M. RICKMAN, F.S.A. London: G. J. W. Pitman. 1901.

THIS is a small volume, not exactly a biography, but a simple statement of facts connected with the life and work of Rickman, deduced from his letters and diaries. The main object seems to have been to put on record memoranda which might otherwise be forgotten.

The name of Rickman ought to be always held in honour among English architects and students of architecture, and we are indebted to his son for giving us this brief record of his life, which, though not of any literary pretensions, contains a great deal of matter of interest.

Rickman lived in Liverpool from 1807 to 1821, and it was in that town that his taste for architecture was first developed. It appears from the notes that some churches in Liverpool which have been now and again attributed to Rickman were in reality only modified under his influence. The parish church of St. Luke (the one which it was recently proposed to pull down to make a site for the Liverpool cathedral) has been ascribed to him, but the only mention of it here seems to show that it was designed by Foster, of Liverpool, and that Rickman, having been shown the drawings, observed that "though beautiful, they were not entirely correct," and suggested some improvements. He may, however, have had more to do with it afterwards. Among his memoranda at this time is an entry recording his having gone to see Fawcett's Foundry illuminated by gas lights, "which are indeed very brilliant, and promise apparently extensive usefulness." This was in 1809.

During this period Rickman took every opportunity of visiting old buildings and drawing them as carefully as possible. "He sketched in pencil in his note-books, and made Indian ink drawings from his sketches." He records in 1811 making the acquaintance at Doncaster of Blore, "a very intelligent clever man" who showed him many fine sketches he had made, "and gave me some intelligence with respect to some Saxon buildings, which is different from what I have heard of." For "Saxon" we may no doubt read "Norman."

The buildings carried out by Rickman were very numerous, and many are mentioned in the memoir. As a kind of appendix Mr. T. M. Rickman gives a descriptive analysis of the successive editions of his father's great work "An Attempt to Discriminate the Styles of English Architecture," and of the variations and additions made in them.

The Art and Craft of Garden-making. By THOMAS H. MAWSON. Second edition, revised and enlarged. London: B. T. Batsford. 1901.

WE may congratulate Mr. Mawson and his publisher on the fact that a second edition of his charming and at the same time practical work on garden-making has so soon been called for. It is not often that a somewhat costly book of this kind reaches a second edition in the short space of six months.

Mr. Mawson's preface to the second edition, in which he to some extent reviews his reviewers, and comments on the great variety and incompatibility of the recommendations that he has received, is good reading, and he makes an important point at the close, in commenting on the fact that "one style of house, which might grace the flat half-timbered districts of Cheshire and Shropshire, is propagated everywhere," and one cut-and-dried garden plan is applied alike in the country and in the suburbs, regardless of both house and site. This is the fact; fashion influences the style of both houses and gardens far too much, regardless of circumstances; and on this account the author may well be excused for, as he says, falling back upon first principles.

Archæological Survey of Egypt. Ninth Memoir: The Mastaba of Ptahhetep and Akhethetep at Saqqûâreh. Part II. By N. de G. DAVIES. London: Kegan Paul & Co. and B. Quaritch. 1901.

THIS number of the publications of the Archæological Survey of Egypt is almost entirely occupied with drawings of the sculptures of Akhethetep; but the illustrations include also a plan and section of the Mastaba, and one or two photographs of portions of the partially excavated masonry. Both from want of time and also because of the peculiar behaviour of the drifted sand of the desert, which acts almost like a fluid, it was considered useless to attempt a thorough excavation of the Mastaba; the corners were cleared, and it was assumed that the walls ran straight between these points.

This Mastaba, which is now one of the sights of Saqqûâreh, lies close to the west slope of the eminence on which the Step Pyramid stands. The description of the structure, and the masonry is of considerable interest. The vices of building seem, after all, to be as ancient as anything else in connexion with the art; the recess above the lintel of the doorway appeared to be built of very large blocks, but they were found to be only thin facing stones, backed by rubble. The interior of the hall is in a state of great ruin. The heavy stone roof was carried on roughly-hewn architraves, ten to eleven feet in length, "which crossed the room in three spans by the aid of four pillars." This is not very clearly put; a reference to the plan shows that there were two of these architraves or stone beams running the long way of the apartment, each partly resting on two squared columns. The total length of the hall is figured as 27 ft. 5 in., the width is a little over 20 ft. The hall is built of white stone, but the surface of the walls and pillars is rough; the pillars merely have the angles chamfered.

The Egypt Exploration Fund. Diospolis Parva. By W. M. FLINDERS PETRIE (special extra publication). *The Royal Tombs of the Earliest Dynasties.* Part II. By W. M. FLINDERS PETRIE. London: Kegan Paul & Co. and B. Quaritch. 1901.

THE principal object of the first-named of these books is to illustrate the sequence of historic periods by examples of the pottery characteristic of each period. There are an immense collection of illustrations of pottery with the supposed dates or approximate dates appended to them; also of a considerable number of prehistoric flints and ivory combs, &c. The stone vases from Abadiyeh are interesting from the refinement of curved line shown on some of them. Some of the archaic decorated pottery is of interest in respect of the forms and means of decoration used. We have also illustrations of alabaster vases, copper mirrors, and copper weapons and tools, the latter ranging from the sixth to the eighteenth dynasty. The volume is full of information valuable to students of Early Egyptian history.

The second volume named in the heading is the continuation of the one previously published on the Royal tombs of Abydos. This volume is entirely occupied with the description and illustration of the multifarious objects found in these tombs. The objects illustrated, including a great many of the "sealings" of various kings, are more of historical than artistic interest: the vases of quartz crystal and of porphyry and syenite for their finely designed outlines. The plans of the various tombs are given, with the numerous rows of subsidiary chambers which surround or accompany the principal chamber. The illustrations to the volume are the result of an immense amount of patient and learned labour.

The Management of Engineering Workshops. A course of six lectures by ARTHUR H. BARKER, Wh.Sc., B.A., B.Sc. The Institution of Junior Engineers, Westminster. 1901.

EVERY ONE who is interested, directly or indirectly, in any industrial establishment will be quite prepared to admit the necessity for a carefully-designed system of work. So far as the experience of competent judges extends, German and American manufacturers are at present at an advantage as compared with the same class in this country. No doubt many of our old-established works have recently been thoroughly reorganised, and numerous new works have been built and equipped on the most approved lines, but in the great majority of our commercial establishments there is considerable room for improvement in respect of systematisation. Some excellent modern treatises on this vital matter are already before the public, but in our opinion none of them are likely to prove of greater value than the

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volume now issued by the Institution of Junior Engineers. The lecturer shows practical knowledge of his subject and a clear perception of the difficulties attending the realisation of theories involved therein. One especially useful feature in connexion with the series now published is to be found in the discussion reported at the conclusion of each lecture. Those taking part in comments upon the views of the author were evidently qualified to speak from personal experience, and their remarks tend to throw light on various important and controversial points. It must, of course, be understood that no treatise or course of instruction can possibly apply to all the requirements of any individual workshop. Every manager must work out his own salvation, but he will be able to derive many valuable hints and to instruct himself upon the general conditions for observance by a perusal of the volume to which this notice refers.

Surveying and Levelling Instruments. By WILLIAM FORD STANLEY. Third Edition. London: E. & F. N. Spon. 1901.

IN the present edition of Mr. Stanley's useful treatise, various suggestions from surveyors and civil engineers are incorporated, and those chapters dealing with constructional details have been revised to accord with modern methods of manufacture. In the last-mentioned respect there are noticeable advances. For instance, the perfection of modern machinery renders it possible to form many parts of surveying instruments from the solid instead of attaching together sundry separate parts. Thus accuracy, strength, and lightness are more readily secured, and the quality of lightness is further aided by the use of aluminium alloys. The general scope and arrangement of the treatise are the same as in former editions which have received attention in our columns, but many new instruments are now described for the first time. Amongst such may be specially mentioned the author's new model theodolite with mechanical tribrach stage, his special transit theodolite for railway work, and a gradiometer patented by him providing means of extending and fixing a scale of gradients by an open reading upon a divided helix. As may be naturally expected, the instruments designed by the author, or made by his firm from the designs of various engineers, receive more ample notice than those produced by other makers, but it should be observed that Mr. Stanley is always ready to speak in approving terms of any developments having real value. His book omits mention of some instruments and methods of work favoured by engineers whose experience has been largely gained in India and the colonies, but as an intelligent record of the appliances in more general use it possesses a distinct value.

Hydraulic and other Tables for Purposes of Sewerage and Water-Supply. By THOMAS HENNELL, M.Inst.C.E. Second Edition. London: E. & F. N. Spon. 1901.

MANY engineers adopt the practice of calculating tables to suit their own requirements, and some of them are induced to make these public, believing that other engineers may find such data useful. As the previous edition of the work to which we now refer made its appearance some eighteen years ago, it is to be feared that a great many other engineers have been relying upon their own tables, or have preferred to employ direct calculations, or again, that they may have possessed themselves of some other of the numerous works of the same kind available. Yet Mr. Hennell's book contains much useful information in a very handy form. The tables relating to the flow of water in various conduits are calculated by Eytelwein's formula, an equation that labours under the drawback of giving results too high for small pipes and too low for larger pipes and channels. Some of the tables, therefore, require qualification by percentages suggested by the author in an explanatory chapter, and we are not sure that this is a convenient arrangement because there is some risk of the necessary corrections being overlooked. Some useful tables relating to rainfall and water analysis have been thoroughly revised and brought up to date, and a table, which ought to be of value to those requiring approximate information, is one showing the dimensions of reservoirs, filter-beds, main pipes, and machinery, for the supply of given populations.

Die Englische Baukunst der Gegenwart. Von HERRMANN MUTHESIUS. Lieferung I. Leipzig und Berlin: Cosmos, Verlag für Kunst und Wissenschaft.

THE author of this work, as many of our readers are probably aware, is the architectural *attaché* to the German Embassy in London. This is the first volume of a work in which he is undertaking the task of illustrating modern English architecture for the German public. The book, in large folio form, consists of German text interspersed with a number of plans and sketches, and a collection of finely executed plates of English buildings.

Among the buildings selected for special illustration are Mr. Norman Shaw's well-known insurance offices at the corner of St. James's-street; Mr. Mountford's Northampton Institute; the Imperial Institute; and, among smaller buildings, a house by Mr. Norman Shaw in Queen's-gate, and Messrs. Bechstein's front in Wigmore-street. The publication, if continued on the same lines, seems likely to give a fair and comprehensive representation of contemporary English architecture. It will give German architects who do not know this country an idea of a modern architecture less eccentric and startling than their own, but not with less variety, and (we humbly hope) in a good deal better and purer taste.

Correspondence.

To the Editor of THE BUILDER.

GALVANISED ROOFS.

SIR,—Can any of your readers advise as to the best method of treating a galvanised roof to prevent rust? Is paint any good? If the colour could be white (for coolness), so much the better.

JOHN CLARK, LTD.

VERANDAHS.

SIR,—In your issue of August 10 you speak of verandahs being "objectionable and now seldom seen." Permit me to say that in Bournemouth, where the fresh air treatment of consumptives is much practised, verandahs are coming greatly into use. Unfortunately they are often not wide enough to sit comfortably in.

C. F. M.

OBITUARY.

MR. HUTTON.—We regret to learn that Mr. James Hutton, of Dundee, has been accidentally drowned whilst bathing. He was a member of the Dundee Institute of Architecture. He prepared the plans and designs for St. John's Free Church, Dundee.

GENERAL BUILDING NEWS.

WESLEYAN CHURCH, ROWLANDS GILL, DURHAM.—The foundation-stones of a new Wesleyan church, to be erected at Strathmore-road, Rowlands Gill, were laid on the 5th inst. The structure, which is estimated to cost about 2,600*l*, will provide accommodation for between four and five hundred persons. It is to be a stone building, and will include a couple of vestries and one classroom, together with a caretaker's house at the south side. Messrs. Turner Bros., Gateshead, are the contractors, the architect being Mr. F. R. N. Haswell, of North Shields.

NEW CHURCH, LOSSIEMOUTH.—St. Gerardine Church, erected in connexion with the Established Church of Drainie, was opened recently by Professor Cooper, Glasgow. The church is on the Coulard Hill, and has been built from plans by Mr. Burnett, architect, Glasgow. Accommodation is provided for over 500 worshippers, and the total cost is about 4,000*l*.

PRIMITIVE METHODIST CHURCH, GNOSALL, STAFFORDSHIRE.—The foundation and memorial stones of a new Primitive Methodist church at Gnosall were laid recently. Messrs. Hickton & Farmer, of Walsall, are the architects. The new church will be in the Renaissance style, and will be built of Ruabon dressed bricks and Monk's Park stone. The front façade will be flanked with octagonal turrets, with stone dressings. Sitting accommodation will be provided for about 150 worshippers, the seats being of pitch-pine. A schoolroom will be erected at the rear of the church, and it will be so built as to be utilised as part of the church on special occasions. The contract for the new building has been given to Mr. Whittingham, of Newport.

ST. MATTHEW'S CHURCH, DUNDEE.—The alterations upon and additions to St. Matthew's Parish Church in Ferry-road have now been so far completed that the church has been opened for public worship. The cost of the improvements, including the new organ, will amount to upwards of 1,000*l*. Messrs. Johnston & Baxter were the architects for the renovations, and the contractors for the various departments of the work were:—Mason, R. Sheach, jun.; joiners, Charles Smith & Son; painters, P. & A. Davie; plumber, David Brown; plasterer, Alexander M'Ritchie; slater, David Hutchison.

CHURCH, DUNMORE, WATERFORD.—Dunmore East Church, Diocese of Waterford, was reopened recently, after being closed nearly four months for restoration and rebuilding of the roof on the nave. The architect was Mr. Fogarty, and the builder, Mr. G. Nolan, of Waterford.

CHURCH, CASHEL, CONNEMARA.—The Church of St. James, Cashel, Connemara, was recently dedicated. The building, the architect of which was Mr. T. J. Hamilton, of Galway, is capable of accommodating some 500 people. The High Altar is composed of marble and coloured Irish marble, with inlays of rich colouring. The bottom base is moulded, the centre panel under the altar table being carved in bold relief, the chalice, surrounded by vine and grapes, standing out conspicuously, with adoring angels on either side. It was designed by Mr. C. J. Taylor, C.E., architect, Dublin, the sculpture work being executed by Messrs. B. J. Taylor & Sons, Dublin.

WESLEYAN CHAPEL, ALLENHEADS, NORTHUMBERLAND.—The new Wesleyan chapel and school erected on a site, presented by Mr. W. C. B. Beaumont, M.P., at Ropehaugh, Allenheads, was opened recently. It has seating accommodation for 250. The architect was Mr. John Ridley, of Allenheads, and the contractors were:—Mason work, Mr. John Glendinning, Allendale Town; joiner's, painter's, and glazing work, Mr. George Race, Eastgate, Weardal; slating, Mr. John Hewitson, Newcastle; and hot-water heating, Messrs. Dinning & Cooke, Newcastle.

CATHOLIC CHURCH, WARRINGTON.—On the 11th inst. the foundation-stone of a new Roman Catholic church in St. Mary-street, Latchford, Warrington, was laid by the Bishop of Shrewsbury. The architect is Mr. Robert Curran, and the builder is Mr. Peter M'Lachlan, of Birkenhead. The new church will be capable of accommodating 600 persons, and will be of Transitional Gothic design, built of Yorkshire stone, with red stone dressings. The length of the interior will be 124 ft. and the width 48 ft., while the height of the clearstory will be 45 ft. The total height of the tower and spire will be 130 ft. The principal entrance will be from St. Mary-street, and there will be one from Clifton-street. There will be a nave and two aisles, with six granite columns on each side of the nave, resting upon a Yorkshire stone base, a large sanctuary, with altar, &c., two side chapels, and vestries, &c. Entrance from the presbytery will be obtained through the cloister leading into the vestries. There will be an organ gallery and choir accommodation over the main entrance. The cost will be 6,000*l*.

RESTORATION OF THE LADY CHAPEL, ST. DAVID'S CATHEDRAL.—The restoration of the Lady Chapel, together with the ante-chapel, at the east end of St. David's Cathedral is now practically completed. The work, which has cost over 2,500*l*., has been carried out by Mr. William Thomas, of Haverfordwest, according to the plans of the architect, Mr. J. Oldrid Scott, of London. During the progress of the work an ancient carving was discovered in the floor. It has been placed in Bishop Vaughan's chapel, with a number of ancient crosses. On the exterior, and above the window at the east end of the Lady Chapel, is a statue of the Virgin and Child, by Mr. Bridgeman, of Lichfield.

NEW CHURCH, ABERDEEN.—The new United Free Church at Ruthrieston, Aberdeen, is nearly completed, and will be opened on the 4th prox. The buildings, which are of grey granite, front Broomhill-road and Station-road. There is a tower, with angle buttresses and spire, rising above the main edifice. In a transept gable is a richly-traceried five-light window. The ceiling of the church is entirely of pitch-pine, and is Gothic in form, with moulded principals at intervals and moulded ribs intervening. The whole of the windows are filled in with leadwork and tinted glass. The present church (behind the new church), when vacated, will be used as a hall for the congregation. The church is seated for 550, and the estimated cost was 3,600*l*. Messrs. Brown & Watt, Aberdeen, are the architects, and the contractors were:—Mason, Wm. Murray; carpenter, Jas. Farquhar; slater, Alex. Law; plasterers, A. Ross & Son; plumber, James T. Ross; and painters, John Mason & Son—all of Aberdeen.

CHAPEL, ETCHINGHAM, SUSSEX.—Plans of a new Wesleyan church for Etchingham have been prepared by Mr. A. R. B. Smith, and the contract of Messrs. Ellis & Son has been accepted. The plans provide for a structure with a frontage to the road and with accommodation for 150 worshippers.

CHURCH, SWINTON, YORKS.—On the 15th inst. the Archbishop of York consecrated a new mission church which has been erected at what is known as the Bridge end of Swinton. The new building is Early English in style, and is not yet completed. The finished portion consists of chancel and part of the nave, providing seating accommodation for about 200 persons. Underneath the chancel there

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is a parish-room, which will seat about seventy or eighty people. Local stone has been used in the construction of the building, and the roof is of pitch-pine and open timber. The cost is about 2,300*l*. When the scheme has been completely carried out it is expected that accommodation will be found for about 450 persons. The architect is Mr. J. D. Webster, of Sheffield, and the work has been carried out under the superintendence of his son, Mr. J. Douglas Webster. The contractors are Messrs. Geo. Longden & Son, of Sheffield, whose acting foreman has been Mr. James Bussey.

SCHOOLS, SOUTH SHIELDS.—On the 12th inst. the new school buildings which have been erected by the South Shields School Board in Mortimer-road were opened by Mr. W. S. Robson, K.C., M.P. The school has been designed as a mixed school for seniors and juniors, and will accommodate 1,160 children in eight classrooms, and a central hall on the ground floor for juniors, and eight classrooms and central hall on the first floor for seniors; and on the second floor there are a gymnasium, joiner's shop, and cookery classroom. There are four cloak-rooms, two on each floor for boys and girls respectively, the head master's and mistress's rooms being on the mezzanine floor between the cloakrooms, and entered from a private corridor leading from the main staircase. The school has been built of brick, and faced with Lowry's Penshaw bricks, with red Carlisle stone dressings. Internally the school is plastered, with the exception of the dadoes and the whole of the staircases, which are faced with brown salt-glazed bricks. The whole of the work has been carried out from the designs and under the superintendence of Mr. J. Wardle Donald, of South Shields, who also designed the infants' school. Mr. L. R. Todd was the clerk of works.

CATHOLIC SCHOOL, ABERDEEN.—The new elementary Roman Catholic School, Summer-street, Aberdeen, was opened on the 15th inst. There are four classrooms, each 26 ft. in length by 25 ft. broad, and 14 ft. high, capable of accommodating 60 pupils, or 240 in all. Besides these rooms there is a gymnasium on the ground floor, 52 ft. by 26 ft. 6 in. The school is built to accommodate 267 children. Mr. R. G. Wilson, Aberdeen, was architect, and the contractors were: Mason, W. Farquharson; carpenter, J. Henderson; slater, G. Davidson; plasterer, Jas. Simpson; plumbers, Thom & Strachan; painters, J. Garvie & Sons; heating apparatus, Robert Tindal, all of Aberdeen.

NEW SCHOOL NEAR ABERDEEN.—The new school provided for Raemoir by Banchory School Board has been finished. The building, which is of red granite from Hill of Fare, contains eighty school places, and cost upwards of 1,000*l*. The architects are Messrs. Brown & Watt, Aberdeen.

BOARD SCHOOL, MILLBRIDGE, YORKSHIRE.—The formal opening of the new Upper Board school, erected by the Liversedge School Board at Millbridge, took place recently. The school, which has been erected in a new road opposite the Heckmondwike Gas Company's offices, has been built to the plans and designs of Mr. A. E. Rhodes, Heckmondwike. The ground-floor contains a central hall, six classrooms, lecture-hall, and chemical laboratory, with teachers' room and lavatories at the entrance. In the basement there are covered playgrounds at each side of the school, with a kitchen for cookery, and a joiner's shop. The contractors have been as follows:—Masonry, G. Horsfall & Sons, Liversedge; joiners, Milnes Bros., Heckmondwike; slater, J. Roberts, Cleckheaton; plasterers, Parkinson Brothers, Heckmondwike; plumbers, glaziers, and hot-water fitters, E. Walker & Co., Heckmondwike; painter, Fred Akers, Hightown; ventilators, E. Bedford & Co, Halifax; blacksmith, J. Hirst, Hightown; wood-flooring, Nightingale & Co., Grimsby; concreting and asphalting, J. Roberts, Batley.

CATHOLIC BLIND SCHOOL, WEST DERBY, NEAR LIVERPOOL.—New blind schools have been erected on the Rice House Estate at Yew Tree-lane, West Derby, by the Liverpool Catholic Blind Asylum. The new schools provide for children of school age from the hitherto overcrowded institution in Brunswick-road. The building accommodates between sixty and seventy children, but the kitchen department is of sufficient size to provide for double that number. Being intended for the blind, the aim has been to avoid staircases as much as possible, so the building extends over a considerable plot of land, a large portion being only one story high. The building is of ordinary bricks, relieved by red brickwork and stone. The inside joinery is of yellow pine, stained green and varnished. The main corridors have tiled floors and tiled dados. The main entrance, approached by a broad drive, is placed in the centre of the principal building, and gives access to an entrance hall and central staircase, and, running right and left, to the main corridor, which is the chief feature of the building. On the left of the main entrance are two reception-rooms, clothesroom, sisters' rooms, kitchens, laundry, and children's dining-room, half of which is at present used as a temporary chapel. On the right are the children's dayrooms and schoolroom. The upper floor provides four dormitories, each for sixteen children, sisters' rooms, lavatories, and bath-rooms, and a small infirmary for six beds. Storage room is supplied in an attic floor in the roof. Messrs. Sinnott, Sinnott, & Powell, of Liverpool, were the architects, and Mr. Michael Fogarty, of Liverpool, the contractor.

SCHOOLS, WHITEHAVEN.—A voluntary school, built at the expense of Miss Crosthwaite on a site given by the Earl of Lonsdale, was opened at Whitehaven last week by the Lord Bishop of Carlisle. The cost has been about 5,500*l*. The architects were Messrs. Oliver & Dodgshun, of Carlisle and Leeds.

NEW ART GALLERY, NEWCASTLE-ON-TYNE.—The foundation-stone has just been laid of the new Art Gallery, which Mr. Alexander Laing is to have erected in Higham-place, Newcastle. The site has been provided by the Newcastle Corporation, whilst Mr. Laing will, on completion of the structure—which is estimated to cost 20,000*l*.—hand it over to the municipality. The site adjoins the Free Library. Messrs. Cackett & Burns are the architects. The buildings will be two stories in height, forming on plan a hollow square, the ground floor consisting of large entrance and sculpture hall, and three art or museum galleries, extending through behind the public library, and lighted from the central court, the upper floor being entirely taken up with top-lighted art galleries, four in number, averaging in size about 65 ft. by 27 ft. by 27 ft. high to the top of the arched ceiling. The main façade is to Higham-place; the corner formed with the Free Library at the south-east angle is occupied by a tower 23 ft. square and 112 ft. high, which contains the grand staircase. The staircase is reached from the sculpture hall, the main entrance to which is about the centre of the Higham-place front. The whole of the floors throughout are constructed of concrete—in the case of the upper floors, combined with expanded metal on steel joists. The surface of the floor to the entrance hall is of tesselated marble pavement, and that of the galleries polished oak blocks. At the north end of the buildings are provided receiving-rooms, private staircase, and picture hoist. The design externally, carried out in polished ashlar, is Renaissance in style, the ground floor forming a rusticated plinth the same height as that of the Free Library, and upon which are detached Ionic columns projecting out on either flank, and carrying the entablature with semicircular arched pediment, under which are sculptured niches. The general height is about equal to that of the library. The main entrance is 8 ft. wide, flanked by double detached Doric columns, with pedimented entablature, and with sculptured figures on either side. Over the arch of the doorway is formed a niche with moulded architrave and twisted shafts on either side. The tower has a deep band of sculpture on the exposed faces immediately under the lantern, the latter being octagonal on plan, and supporting a stone dome about 20 ft. diameter. The system of heating and ventilation is the plenum.—*Newcastle Leader.*

NURSES' HOME, SCARBOROUGH HOSPITAL.—A new Nurses' Home has been built in connexion with the Scarborough Hospital. The building has been erected on the site of an old house in Auborough-street, which communicated with the open space at the back of the hospital. It has direct communication with the hospital, and consists of a sitting or recreation room on the ground floor, a small service pantry, twelve bedrooms, two bath-rooms, lavatories, &c. The home is built of red brick. The principal contractors for the work have been Councillor Bland and Mr. Abraham Moore, and the whole has been carried out under the supervision of Mr. Frank A. Tugwell, architect. The total cost of the work exceeds 2 000*l*.

NORFOLK AND NORWICH SAVINGS BANK.—New premises have been erected in Red Lion-street for the Norfolk and Norwich Savings Bank. The general contractors for the work have been Messrs. Scarles Bros., the masonry has been carried out by Mr. J. G. Bush, and the carving executed by Mr. Minns, of Norwich. The marble-work has been done by the Art Pavements and Decorations, Limited, London. The heating apparatus, fire-places, &c., have been supplied by Messrs. Barnard, Bishop, & Barnards, Norwich; the electric lighting, wiring, and fittings by Messrs. Pank & Son, Norwich; and the electroliers in the banking hall by Messrs. Neatby, Evans, & Co., London. The architects were Messrs. G. J. & F. W. Skipper, whose designs were selected in a competition limited to the architects of the city and county.

BUILDING IN MOORFIELDS.—We understand that Mr. G. D. Martin has been appointed architect of the buildings that are about to be erected upon the site which has recently been cleared by the demolition of the Roman Catholic Church of St. Mary, Moorfields, and the adjoining presbytery, clergy-house, and school premises.

NEW THEATRE, ST. MARTIN'S-LANE.—Mr. W. G. R. Sprague has been entrusted with the preparation of the plans and designs of a theatre, having a capacity of 1,040 persons, to be erected upon the vacant site in St. Martin's-lane, with frontages on the south and west sides in St. Martin's-court.

Y.M.C.A BUILDINGS, ST. HELENS.—In a limited competition for plans for the erection of the new Young Men's Christian Association buildings for St. Helens, those of Messrs. Briggs & Wolstenholme, of Liverpool and Blackpool, have been accepted. The buildings will be erected on the plot of ground which adjoins the gymnasium, facing North-road. The principal feature of the ground floor will be the main entrance, which will be 16 ft. wide, and two shops on the Duke-street side, and five others facing North-road. Through the main vestibule will be an entrance hall, through which entry will be obtained to the present gymnasium. On the first floor there will be first reached an open reception hall, leading to the various rooms. On the left an entrance will be made to the gymnasium gallery, next the secretary's office and private room. A reading-room will look out on the corner of Duke-street, while immediately over the entrance will be a library and parlour for writing purposes. On the right, extending to the end, a lecture hall, which may be divided into three by folding doors, is planned. On the second floor there is to be a lecture-room the same size as the present assembly-room, together with other smaller rooms for caretakers, &c.

COTTAGE HOMES, ONGAR, ESSEX.—New cottage homes, to accommodate 300 children, are to be erected at Ongar for the Hackney Board of Guardians. Mr. W. A Finch has been instructed to prepare drawings for the homes.

COUNCIL CHAMBER, NEWPORT.—The foundation-stone of the permanent council chamber and offices of the Monmouthshire County Council was laid recently by the Chairman of the Council, Alderman Edwin Grove, at the buildings in course of erection at Pentonville, Newport. The new building is being erected from the designs of Mr. W. Tanner, the County Surveyor, by Messrs. D. Richards, Limited, builders, Newport, whose contract price is 8,470*l*.

THE VICTORIA WING, BLACKBURN AND EAST LANCASHIRE INFIRMARY.—It was decided in April, 1897, that Blackburn's permanent memorial of the late Queen's Diamond Jubilee should be an additional wing to the infirmary to be known as the Victoria wing, and should include a modern operating theatre. The plans of Messrs. Simpson & Duckworth, architects, of Blackburn, were accepted for the extension, and the foundation-stone was laid on June 22 in that year. All that was at that time definitely decided was that the extension should be in harmony with the south wing, so as to give a symmetrical appearance to the whole. The completion of the Victoria wing has balanced the front, there being now two blocks upon each side of the central block, which contains the main entrance-hall. The accommodation provided in the basement includes a pathological laboratory, dark room, and room for the use of the Routgen rays, heating apparatus-chamber, linen and grocery stores, and room for the extra stores of clothing and for use as a sewing-room. All these rooms are well lighted, and the walls are finished with white glazed and red pressed bricks. The floors are finished either in marble terrazzo or with teak and maple wood blocks. On the ground floor is the boardrom (to be used also as the secretary's office) facing the front, measuring 26 ft. 6 in. by 20 ft. 8 in. Across the corridor are the private quarters of the resident medical staff. The floors, excepting in the main corridor, are finished with teak blocks. On the first floor is provided a sick ward to the front, 26 ft. 6 in. by 20 ft. 6 in., and across the corridor a suite of rooms for operations. The heating is by means of radiators upon the low pressure system, the hot water being supplied from calorifiers heated by steam. Each set of rooms is worked upon a separate system of circulating pipes, and each radiator is separately controlled by valves. A general temperature of 85 deg. Fahr. has been arranged to be maintained in the operating theatre, and a temperature of 75 deg. in the anæsthetic room, a normal temperature being required only in the rest of the building. Provision for ventilation is made by inlets to the radiators, the incoming air being passed through filter screens having a spray of water passing constantly over them when in use. The vitiated air is extracted by means of an electric fan with connecting tubes and flues from the several rooms. Further ventilation is provided by means of opening casements and hopper ventilators in the window frames. The additional accommodation provided in the Victoria wing is seven beds. When, however, the quarters vacated by the resident doctors have been converted into a ward, and the old operating-room turned into another ward, the entire accommodation will be for about 120 as against 102 at the present time. The principal contractor for the work has been Mr. W. J. Woof Cronshaw, of Blackburn, and the several sub-contractors were:—Messrs. T. Higson & Sons, joiner's work; Mr. John Dean, slater's work; Mr. W. H. Law, plumbing and glazing; Mr. W. H. Ainsworth, plastering; and Messrs. H. Pickup & Son, painter's work. The special contract work has been executed by:—Messrs. Minton, Hollins & Co., Stoke-upon-Trent, wall tiling; Mr. J. F. Ebner, London, wood block flooring; Messrs. J. & H. Patterson, Manchester, carving and marble terrazzo flooring; Mr. George Wragge, Manchester, wrought-steel window casements; Mr. Jas. Gibbon, locks and door furniture, &c.; and Messrs. Morrison, Ingram, & Co., sanitary fittings. The scheme for the heating and ventilation has been carried out by Messrs. Dargue, Griffiths, & Co., Liverpool; and the installation for the electric lighting has been undertaken by Messrs. G. H. Woods, & Co., of Blackburn, from the specification of the consulting electrical engineers, Messrs. Lester, Taylor, Kelly, & Hide, of Liverpool. The whole of the work has been

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carried out under the superintendence of Messrs. Simpson & Duckworth. The operating theatre occupies the east end of the wing on the first floor. It measures 26 ft. 6 in. by 23 ft. Off it is a sterilising room, 12 ft. 6 in. by 6 ft. 7 in.; an anæsthetic room, 19 ft. by 13 ft. 6 in.; and the suite is completed with a small ward, 19 ft. 3 in. by 14 ft. 6 in. for gynæcological cases, and the usual laterine accommodation.

SCHOOL INFIRMARY, DENSTONE COLLEGE, STAFFORDSHIRE. — The Duchess of Sutherland recently laid the foundation stone of a new school infirmary in connexion with Denstone College. The object of the infirmary is to cope with the first outbreak of infectious diseases among the boys of the school. The staff will be placed in a position to deal with minor outbreaks of two or three orders of infectious disease. The portion of the infirmary now to be erected is a four-bed ward and a one-bed ward. The completed scheme provides for an isolation block for ten patients. It will be built of red bricks, with stone dressings, and tiled roofs. The architects are Messrs. R. Scrivener & Sons, and the builder Mr. Thomas Godwin, Hanley.

MISSION HALL, NORTH SHIELDS.—The foundation-stone of a new mission hall in Northumberland-street, North Shields, in connexion with Tynemouth Congregational Church was laid recently. The buildings will comprise a mission hall, children's school, vestry, class-rooms, &c. The school will accommodate over 200 children. The work will be carried out by Mr. Thomas Robson, builder, of Tynemouth, from plans by Messrs. Thomas A. Page & Son, architects, South Shields.

SANITARY AND ENGINEERING NEWS.

PUBLIC IMPROVEMENTS IN BIRMINGHAM. — According to the *Birmingham Post*, considerable progress is being made with the various public improvements which have been undertaken by the Public Works Committee of the Corporation. The principal scheme is the reconstruction of the sewers, a project which was commenced about two and a half years ago, and will occupy the attention of the authorities and the Finance Committee, who have charge of the public purse, for some years to come ere it can be said to be within measurable distance of completion. At the outset the city was divided into five districts, and operations were commenced in Edgbaston and Harborne, a district which, in respect to its sewerage, was the worst in Birmingham. In the reconstruction of the sewers in the locality, which embraces practically the whole of the Edgbaston Parliamentary division, it became necessary to lay down about sixty-four miles of new foul-water pipes, and in addition many miles of storm-water pipes. The total cost of this portion of the scheme was estimated at 155,000*l.* in round figures, and it was believed that the work would be finished in about four or five years. This estimate in regard to time and money, it is expected, will be well within the mark. Nearly two-thirds of the work has already been accomplished, and if the same progress is maintained another twelve months or so ought to see the beginning of the end, so far as this particular district is concerned. Some of the worst neighbourhoods have been finished, and at the present time the work is proceeding in Edgbaston Park-road, Hermitage-road, Westbourne-road, Norfolk-road, Harborne-road, Calthorpe-road, and some of the adjoining thoroughfares. A good deal of the work is in the hands of contractors, but by far the most important part of the scheme is being carried out departmentally. The weather is responsible for the progress made, but it is believed that the culverting in the roads named will be completed within the next two months, and then other thoroughfares will be closed to traffic. As soon as the district is resewered the next worst of the five districts will be taken in hand, and so the work will be continued until the whole of the city has been provided with new sewers, which it is anticipated will be sufficient for all practical requirements for about half a century. Another important matter which is engaging the attention of the Public Works Committee is the construction of the Rea main sewer at Saltley. It runs from Montague-street alongside the river Rea through the land of the Midland Railway Company and the Gas Department to beyond Nechells Recreation Ground, a 6-ft. culvert being used between Montague-street and Saltley-viaduct, and a 7-ft. culvert from that point to the terminus. The Sewer Department is also very busy in other parts of the city, not only in respect to the renewal of pipes, but in the inspection and superintendence of the sewerage in those districts where the building trade is especially active just now. Street and road improvements are in progress on every side of the city. Those people who are acquainted with Pritchatt's-lane, which runs from Edgbaston Park-road to Somerset-road, well know what a narrow awkward thoroughfare it is. It is an important link, which to all intents and purposes connects the Bristol-road with Harborne, and all who use it will rejoice to learn that it is now to be straightened and broadened and made something like what a public road should be. In the central parts of the city attention is turned to Summer-lane, where between Snow Hill and Hospital-street the macadam is being replaced by granite on a concrete foundation. The upper part of Broad-street has recently been relaid with wood, and the London and North-Western Railway Company are improving the bridge in Navigation-street which carries the thoroughfare over the railway from Hill-street to Pinfold-street. The wood floor on the top of the girders is in course of restoration, and when that is finished the Road Department of the Corporation will, at the expense of the company, complete the work by laying down on a concrete foundation a new granite pavement.

TRURO SEWERAGE AND SEWAGE DISPOSAL.—The City Council at their meeting on the 13th inst. adopted the recommendation of the Sanitary Committee that the services of Messrs. Beesley, Son, & Nichols, of Westminster, be retained as engineers for the preparation of a scheme for the interception and disposal of the sewage of the city.

EXTENSION AND MAINTENANCE OF LIVERPOOL DOCKS.—The annual Report by Mr. Anthony G. Lyster, Engineer to the Mersey Docks and Harbour Board, on the general state and progress of the dock works at Liverpool shows that large works have been carried out during the year, and that several extensions are still in progress. Reference is made to the completion of the new tobacco warehouses at Stanley Dock, which has fourteen floors, with an aggregate area of 36 acres, and is capable of storing 60,000 hogsheads. Some figures are given in the Report regarding the dredging work done at the bar and in the channels leading therefrom to Liverpool. The quantity of sand removed during the year amounted to nearly 9,000,000 tons, the result being that the condition of the bar and the channels has been fairly maintained. In conclusion, the Report states that the amount of work carried out under the control of the Engineer's department has been exceptionally large during the year. The wages bill has at times been within a few pounds of 11,500*l.* per week, and the number of men employed has been upwards of 7,800 at one time. These figures, it is pointed out, are exclusive of payments to contractors, and do not include the men employed by them. The total expenditure in the Engineer's department for the year has been 1,230,949*l.*

LEEDS WATER SUPPLY.—The available water in the Leeds Corporation reservoirs has now been reduced to a quantity equivalent to 48½ days' supply. At the corresponding period last year there was enough to last 78 days. It is stated that the recent rainfall has not benefited the reservoirs in the slightest degree. The position was discussed at a meeting of the Waterworks Committee on the 16th inst., and steps were taken for increasing the supply and diminishing the consumption.

FOREIGN.

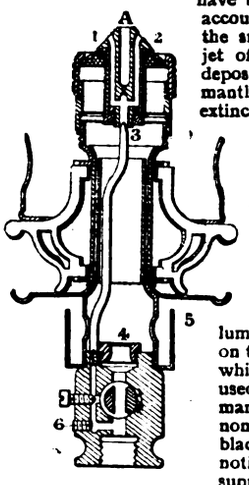
FRANCE.—M. Scellier de Gisors, the official architect to the Luxembourg, is occupied with the restoration of the chapel of the palace, a beautiful interior which has for a long time been used as a storehouse for things not wanted. An exhibition of pictures of English, Spanish, and Italian painters is also to be organised at the Luxemburg.——A new Hôtel de Ville has been built at La Ferte Macé (Orne), as the result of an architectural competition, in which the design by MM. Kepfer and Lepeigneux, of Paris, was selected.——The Société des Amis des Arts of la Manche has opened its fifth annual exhibition at Cherbourg.——A fine chimney-piece by M. Felix Charpentier, the model of which figured in this year's Salon, has been erected in the Salle des Fêtes of the Town Hall at Avignon. Two bronze figures, symbolising Wine and Cider, support the entablature, which is surmounted by a group of Bacchantes carved in stone.——M. Ulmann, architect, has been commissioned to carry out the large buildings for the Institut des Sourds-Muets for the Department of the Seine.——A palace for the Military Commandant is shortly to be commenced at Tunis, at a cost of 2,300,000 fr.——M. Louis Chapelle, a well-known contractor for public works at Paris, has been killed in an accident to an automobile car at Corneville-sur-Risle, near Rouen. He had taken a large part in the construction of the buildings for the Paris Exhibition of last year.

AUSTRALIA.—A large railway station is about to be erected at Port Pirie, South Australia.——A Roman Catholic church is being erected in Merrigum, Victoria.——Mr. James Henderson, architect, of Newcastle, New South Wales, has been commissioned by Messrs. Fred. Ash, Limited, to prepare plans for a large bond and bulk warehouse, to be erected in Burwood-street, Newcastle.——The Government has decided to have statues executed of Sir Henry Parkes, James Squire Farnell, Daniel Henry Denieby, Dr. Lang, and Sir James Martin, and they are to be placed in niches on the exterior of the Lands Office, Sydney. They will be of sandstone.——The Parramatta Hospital for the Insane is to be considerably enlarged.——A church is to be erected at Thoona, Victoria, for the Church of England congregation.——A large hotel is being built at the corner of Gipp-street and George-street, Sydney, on the site of the old Larkin Hotel.

MISCELLANEOUS.

PAINTING CONTRACT AT FULHAM.—At the meeting of the Fulham Board of Guardians on Thursday last week, the General Purposes Committee reported that they had considered the following tenders for painting and cleaning works at the infirmary and offices: — Joseph Halse, Fulham, 1,645*l.*; W. J. Renshaw, Putney, 1,497*l.*; J. Bendon, Hammersmith, 1,050*l.*; Vigor & Co., Poplar, 860*l.*; J. J. Richards, Brixton, 792*l.*; G. McArthur, Fulham, 760*l.*; E. Mills, Westcombe Park, 743*l.* They recommended the acceptance of the tender of Mr. McArthur, lowest but one. Mr. Rule drew attention to the discrepancy in the tenders, and said the Committee ought to have employed a quantity surveyor before inviting tenders. It would have been more business-like, and would have cost only about 25*l.* Surely one man was not going to do for 743*l.* the same work that another wanted 1,600*l.* for! The Chairman (Rev. P. S. G. Propert) said the Committee had the architect before them, and went into the matter as fully as they could. Mr. Westwood said the architect told the Committee that the estimate of 1,000*l.* was altogether beyond the mark, and that although Mr. McArthur would have to cut it fine, at the same time he thought it possible for him to do the work for the money. Mr. Peter Lawson desired to know why the lowest tender should not be accepted, saying that Mr. Mills had carried out work satisfactorily in the past. The Chairman replied that the Committee, in its wisdom, thought that for a matter of 17*l.* the tender should not be taken from a local man. Ultimately the Committee's recommendation, to accept Mr. McArthur's tender, was adopted. It was further resolved that a clerk of works be appointed at a salary of three guineas a week, and that the architect be requested to select a qualified man for the post. Afterwards it was stated by the architect that the Clerks of Works' Association had informed him that four guineas a week was the minimum salary that could be accepted by a qualified clerk of works. It was decided to empower the architect to agree to the larger salary if necessary.

NON-LUMINOUS BYE-PASS FLAME FOR INCANDESCENT BURNERS.—Hitherto incandescent burners fitted with a bye-pass for kindling the main gas jet have been objectionable on account of the liability of the small luminous bead or jet of flame to produce a deposit of carbon on the mantle, and its liability to extinction by air draughts or by the sudden cutting off of the gas supplying the main flame. Mr. A. Clarke, of Albion-road, London, has sent us a burner in which the bye-pass device has, by an extremely simple device, been altered to produce two small non-luminous flames situated on the sides of the socket which receives the rod used to support the mantle. The flames being non-luminous cannot blacken the mantle. We notice also that the gas supplying the main flame may be alternately turned on and off suddenly, repeatedly, and in quick succession without extinguishing the bye-pass flames, and that the latter are less readily extinguished by draughts than the single luminous flame usually employed.



THE ROMAN VILLA AT BRISLINGTON, BRISTOL.—The further investigations carried on at the site of the Roman villa have resulted in the discovery of a large number of interesting Roman relics. In addition to human remains, &c., the well has also, we are informed, yielded an abundance of objects of considerable interest, among them being a series of seven metal vessels of great rarity, with handles beautifully marked. A quantity of Roman pottery, including a pretty little pitcher in a perfect state of preservation, is likely to be admired. Near the bottom of the well were found some remains of wooden buckets, with portions of iron handles attached; also part of a comb cut in wood, with fine teeth on one side and coarse on the other. Some of the articles in bronze included a very nicely worked spoon, also a pin and fibula. The whole of these finds has been handed over to the Museum.—*Bristol Times.*

IMPROVEMENTS IN HOXTON.—The Shoreditch Borough Council have lately opened new premises in Branch-place, Hoxton, of which the lower portion constitutes an addition to their electrical lighting works, whilst the upper part of the house will form a "shelter" for temporary occupation by poor families in whose own homes infectious disease has broken out, and who are therefore dispossessed for a term during the disinfection of their rooms.

SWEDISH GRANITE AND TIMBER.—In the Gothenburg district quarrying is reported (officially) to be now carried on on a very large scale. The granite industry of Lysekil and the immediate vicinity thereof chiefly comprises the production of paving-

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stone, of which considerable quantities are shipped to the United Kingdom and the Continent. Granite for building and other purposes is obtained at the quarries farther north, bordering the Norwegian frontier. The granite is said to have found a good market of recent years in the United Kingdom. The exports of it last year included 63,024*l.* worth from Strömstadt, 3,157*l.* from Uddevalla, 755*l.* from Marstrand, 14,540*l.* from Warberg, 28,000*l.* from Halmstad, and 57,122*l.* from Carlscrona. The year was most satisfactory to those engaged in the timber trade. Both redwood and whitewood, particularly in large dimensions, were easily disposed of at advancing prices, whereas battens and small dimensions met with less demand, and the prices of these could consequently not be fully maintained. The prospects of the timber trade are stated to be at present very good, and sawmill owners and shippers consequently look forward to another prosperous season. Last year's exports included from Gothenburg 55,436 standards of deals, battens, and boards, 1,382 standards of other wood goods, joinery to the value of 276,305*l.*, laths to the value of 119,440*l.*, and turners' goods to the value of 25,771*l.*; from Uddevalla 12,023 standards of wood, and joinery to the value of 25,978*l.*; from Warberg 7,100 standards of wood; from Halmstad 45,000 standards; from Helsingborg 11,596 standards; and from Carlscrona 13,450 standards.

SCHOOL BUILDINGS.—The Board of Education has issued the following rules as to the building of Higher Elementary Schools:—"1. Article 110 (6) of the Code limits the numbers of a Higher Elementary school to about 300. For such a school ten classrooms will generally be required, since every class should have its own classroom. Of the ten classrooms at least four should be suitable for a class of forty scholars. 2. (*a*) A classroom for forty scholars should have an area of about 620 square feet; a classroom for thirty scholars should have an area of about 480 square feet. (*b*) All classrooms must be furnished with single desks; the desks should be 2 ft. long, arranged in pairs with intervals of 2 in. and gangways of 2 ft. 3. Every Higher Elementary school should be provided with suitable laboratories. (*a*) The laboratory accommodation must be sufficient to provide at one time for the largest class in the school. (*b*) There should generally be one laboratory for chemistry and one for physics. (*c*) A laboratory should afford 30 square feet of floor space for each scholar; the minimum size will, therefore, be 600 square feet, but it is, as a rule, desirable that the laboratory should be somewhat larger. If, however, the laboratory accommodates more than twenty-five scholars, a second teacher would be required. (*d*) Laboratories must be fitted with suitable tables, which must be well lighted; they should be properly supplied with gas and water. For chemical laboratories, sinks, cupboards, and the necessary fume closets must be provided. (*e*) A small balance-room may be provided if desired. 4. (*a*) In addition to the classrooms and laboratories, it is desirable that a Higher Elementary school should include at least one lecture-room, which should be fitted with (1) demonstration table furnished with a gas and water supply and a sink, and (2) a fume closet. A lecture-room should have an area of about 750 square feet. (*b*) A small preparation-room, fitted with bench sink, cupboard, and shelves, and proper supply of gas, should be provided in a convenient position for the lecture-room. 5. A drawing classroom for the more advanced drawing is desirable. It should provide 30 square feet of floor space for each scholar; the best size will be a room with an area of 750 square feet. If suitably lighted the hall would answer for this purpose. 6. Other special rooms for cookery, laundry work, and manual instruction should be provided in accordance with the Rules in Schedule VII. of the Code. 7. A Higher Elementary School may be planned with a central hall, but no class (other than drawing) can be recognised in such a hall. Good dimensions for such a hall would be 50 ft. by 25 ft. As an alternative the hall might be adapted for use as a gymnasium when occasion requires. Such a gymnasium for a school of 300 children should have a floor space of 1,800 square feet. The gymnasium should not be adjacent to the laboratories."—*Standard.*

HOUSING QUESTION, LIVERPOOL.—Colonel W. R. Slacke, R.E., an Inspector of the Local Government Board, held an inquiry in the Town-hall, Liverpool, into the application of the City Council to the Local Government Board for sanction to borrow 42,500*l.* for the erection of dwellings for persons of the working classes. Mr. Cripps, assistant solicitor to the Corporation, at the outset explained that the application was to borrow 42,500*l.* to provide for the erection of 251 dwellings, which would accommodate 1,071 persons. The site was that known as the Adlington-street area, and was bounded by Adlington-street, Henry Edward-street, Lace-street, and Bispham-street. The Corporation had on a former occasion given a pledge to erect houses to accommodate a large proportion of the people who had been, or would be, dispossessed owing to the demolition of insanitary property. In respect of that pledge, they had built, were building, or were about to build, 353 houses, estimated to accommodate 1,648 persons. The Corporation had also in prospect, in fact they had acquired, sites for building workmen's dwellings, and would shortly be in a position to submit further plans for houses capable of accommodating about 1,200 persons. By this application they intended to make provision for the rehousing of 80 per cent. of the dispossessed tenants on the particular area. They were providing for ten four-roomed dwellings, 133 three-roomed dwellings, sixty two-roomed dwellings, and forty-eight one-roomed dwellings. The one-roomed houses were very useful, and a large number of people would be in the workhouse or receiving parish aid if such one-roomed dwellings were not provided. Regarding the repayment of the money they desired to borrow, Mr. Cripps said the Housing Committee hoped the Local Government Board would see their way to extend the period to sixty years. The buildings were erected and looked after by the Corporation, and were estimated to have at least 120 years' life. In regard to land, they thought they ought to be allowed 100 years within which to repay loans. Mr. F. T. Turton, deputy surveyor, gave details of the scheme connected with the present application. Subsequently the inspector visited the area in question.

NORFOLK MARKET HALL, SHEFFIELD. — The Finance Committee of the Sheffield City Corporation are advertising for plans from local architects for the structural improvement of the Norfolk Market Hall, the principal of the markets of which the Municipal Authority has control. The object is to improve the letting value of the property, and the improvements to be effected include the better natural lighting of the interior (possibly by the provision of more windows), the development of the shop accommodation both interior and exterior (by the removal of the existing stalls and appliances, or otherwise), and the provision of more adequate lavatory accommodation in such position as to be available for those using the market and the public outside. Competing architects are to be at liberty to show in their plans a gallery carried around the interior of the hall at the first-floor level, to give the public access to an upper story of shops, if such an arrangement is considered commercially practicable. The estimated cost of these improvements is not to exceed 15,000*l.*

THE GOUPIL GALLERY.—Messrs. Boussod Valadon & Co. have disposed of their London galleries to their late manager, Mr. William S Marchant, and have further granted to his firm, Messrs. William Marchant & Co., the sole right to describe themselves as Messrs. Boussod Valadon & Co.'s agents in the United Kingdom.

SALES OF PROPERTY. — Messrs. Protheroe & Morris will sell by auction on the 24th inst., on the estate, seventy freehold sites, comprising a further portion of the East Pentire Building Estate, Newquay, Cornwall. The estate, overlooking the Fistral Beach and the Gannel, faces the Atlantic Ocean, is about 100 ft. above sea level, and within one mile of Newquay Station on the Great Western Railway. The lots to be offered are suitable for the erection of detached residences, shops, and bungalows, together with an hotel site.——Mr. E. A. Jephcott, of Alcester, will sell by auction at Swan Hotel, Alcester, on the 28th inst, the old Presbyterian Meeting House, Alcester, which was erected in 1723. Also the old panelled oak, &c., therein (estimated from 3,500 to 4,000 superficial feet).

THE DEVONIAN CLUB.—The Committee of the Devonian Club, on the 20th inst., elected as honorary secretary Mr. C. H. Brodie, A.R.I.B.A., in succession to Mr. George Wreford, C.C., the founder and honorary secretary from the commencement in 1891. Architects and their assistants who hail from the western shire are invited to communicate with Mr. Brodie at the club, Adelphi Hotel, W.C.

CAPITAL AND LABOUR.

DUNDEE BUILDING TRADE. — An important agreement, affording a promise of industrial harmony in Dundee building trade, has been entered into between the masters and operative masons of the city. This section of the building trade has within recent times suffered from strikes and petty disputes involving a good deal of friction between employers and employees. The agreement referred to—the terms of which have now been accepted by both parties—provides that for a year, that is to say as from June last, no reduction will be made in wages. Having regard to the present position and prospects of the trade this provision has proved specially acceptable to the operatives. The interests of the masters are safeguarded by a clause which will have the effect of prohibiting the calling out of men from the jobs of employers whose policy and actions do not coincide with the views of the Union officials. Probably the most important feature of the agreement is a proviso for the appointment of an arbiter mutually chosen, whose decision in all matters of dispute will be binding on the signatories to the agreement.—*Dundee Advertiser.*

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

7,077.—DREDGING APPARATUS: *F. Hoffmann.*—Two shafts with intermediate bevel-wheels drive a dredging-wheel at the mouth of a suction-pipe; pipes, or that portion of the mouth of the suction-pipe which the ground covers, will regulate the ratio of the amounts of dredged material and water. If a turbine is adjusted at the mouth of the suction-pipe, that ratio will be regulated with a curved slide worked by a rod and covering a portion of the turbine-wheel; the ratio is indicated by pressure upon an air-bubble manometer within the upper arm of the suction-pipe, which for dredging in different depths can be made after the telescopical kind.

7,092.—A GOVERNOR FOR WATER-WHEELS: *E. F. Cassel.* — Springs compress together two discs which form the wheel, and each spring carries a bucket against which a jet is directed, unequal and adjustable weights affixed to frames constitute a differential governor mounted upon brackets, when the speed becomes too high the discs are forced asunder by the arms of the governor and the jet then escapes between the separated buckets; one set of buckets may be discarded, or loaded arms pivotted on to one of the discs may be employed instead of the weights. By another arrangement the buckets are divided, and a pivotted loaded arm is attached to the underside of each half-bucket, whereby as the speed becomes excessive the halves open asunder through the centrifugal force exerted.

7,316.—A DAM OR DYKE FOR WATER: *G. Serrazanetti.*—In order to control a sudden increase of water flowing down a torrent, a dam or dyke is constructed across the narrow portion of the valley, and its lower part (which is built up of mixed earth and straw) is strengthened with a casing of iron bars and wire trellis-work that surrounds a block of gravel and stones. The collected water is suffered to flow away through channels cut in the dam, and along the hillside additional overflow canals are supplied.

7,337.—MEANS OF HEATING WATER: *F. Hatcher.*—A gas-geyser has an outside cylindrical wall and an inside conical roughened or corrugated wall, which constitute an annular water receiver to which an outlet is fitted. The heater is joined to the inlet, and, by tubes, to the discharging-ring, by which means the discharged water is directed against the inside casing.

7,350.—AN INCANDESCENT LAMP: *E. Schattner and F. W. Harmer.*—A parallel rod of carbon or some other conductive substance serves for a preliminary heating of a magnesia or similar refractory incandescence rod, and after the magnesia rod has become heated the supply of current to the heater will be cut off by the thermal expansion either of a coiled strip having a contact-arm or of a magnesia rod which actuates a contact-spring mounted upon an insulating support and a metal strip.

7,366.—A CONTRIVANCE FOR WINDOWS: *H. Pieper.*—The inventor's object is to maintain a uniform temperature within the room and to prevent moisture from becoming condensed or frozen upon the window. Double panes are employed for the glazing, and openings or channels extend from the spaces between the panes to the air outside, the entrance of dust through the openings is obstructed with wire strips.

7,369.—SPIGOT-AND-SOCKET AND SLEEVE JOINTS: *Ritter von R. S. Traunfels.*—In order to dispense with asbestos or similar packing materials in the case of pipes that may be subjected to a high temperature, copper or other metal cones are deposited, for a sleeve-joint, upon the pipes with an electrical current, and nuts are set in engagement with the screw-threaded double conical sleeve; for another mode of jointing, and in substitution of the conical sleeve, a thin layer of copper is deposited upon the pipes, and conical sleeves are heated and then drawn over the copper surface. In the case of a spigot-and-socket joint, one conical piece only is made, one of the pipe-ends being screw-threaded.

7,401.—A VENTILATOR: *J. J. Rawlings and W. R. Rawlings.*—The apparatus comprises a middle frame which is to be built into the wall, a gauze or other screen over a louvred grating, and an inside frame containing a counter-weighted valve which may be shut with a pull-cord and is fitted with stops and a buffer-pad.

7,403.—A FASTENING FOR DOORS, WINDOWS, &C: *A. Graham.*—For a sliding window a pivoted piece, on which is a pierced projection, is carried by a plate which is affixed to one of the frames. To the other frame is affixed a plate, from the under side of which project lugs or pieces wherein a spring-controlled bolt will slide for engagement with the pierced projection. The bolt is to be drawn back with a pin that slides in a slot in the latter plate, whereupon the lug is freed, and one can lift the pivoted piece for the separation of the frames.

7,406.—WORKING OF STONE: *F. Trier.*—Upon the slide of a reciprocating machine having rolling cutters are disposed auxiliary cutters which are oppositely inclined to the main cutters. Trunnions carry the holders of the finishing tools that may be worked with a stop-rod for a reversal of the skew with the end of the stroke, and in order to start the rolling of the cutters they are laid against elastic adjustable rails; collars and pins hold the shank of the holder in any one of four positions in order that the cutters may work upon a rest having a swivel-adjustment. For giving the skew the holder is caused to rock between stops. Various other adaptations and features of the machinery are specified.

7,433.—A BALL AND SOCKET JOINT: *H. Hirst and J. H. Collings.*—An adjustable support for a

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straight rod upon a base-plate is supplied by means of a ball that is retained between a stem upon the base-plate and a slotted socket, the latter being held with a flange, which engages with a coupling-ring screwed on to the stem. The contrivance enables the socket to turn about the stem, and the rod can move angle-wise in any direction upon the base-plate.

7,459.—JOINTS AND COUPLINGS FOR WATER-CLOSET PIPES: *C. H. Moore.*—An annular recess is fashioned in the basin, which is also undercut for taking the flanges of a screwed collar which is affixed with lead and cement. The collar is set in engagement with the interior screwed collar of the leaden soil-pipe. In another form, a bayonet joint may be substituted for the screw joint of the soil-pipe.

7,503.—A FILLING FOR WOODEN BLOCK PAVEMENTS: *T. K. Muir.*—Some flexible absorbent fabric is filled in between the rows of the blocks, the fabric having been previously coated with a compound of granulated cork, saw-dust, &c., steeped in a water-proofing material, such as tar or asphalt.

7,505.—ARRANGEMENT OF BUNSEN GAS-BURNERS: *P. Lacroix.*—The burners are fashioned so that the relative positions of the axes of the gas-jet and the mixing-tube may be experimentally adjusted before they are finally secured in their places, a tube that is pierced with air-holes is put around the gas-jet which is mounted upon another tube; in one variant shape the mixing-tube can be adjusted so as to be only parallel to the axis, with one set of three screws, in another shape two sets of three set-screws, disposed on a circle, secure the mixing-tube to the perforated tube, so that its adjustment may be either inclined or horizontal.

7,534.—AN APPLIANCE FOR USE WITH CRANES: *A. E. Brown.*—By this invention, which, whilst primarily intended for pontoon cranes or derricks, is claimed to be available also for use with cranes and similar hoisting machines on land, it is arranged that a balance weight which runs upon rails in the line of tipping shall be moved so as to act against the tip of the pontoon with ropes, the ropes being worked by a steam or other motor. The controlling valve of the motor is joined to floats in tanks which are disposed in the line of tipping.

7,579.—FITTINGS FOR SLIDE RULES: *R. C. Smith and J. Cruickshank.*—For indicating the order of "tens" in a result is devised a slide-rule or calculating scale made of carboard, two scales are graduated upon the slide, which has guides consisting of clamps (on each of which is a flexible celluloid transparent plate) that are inserted through holes in the body of the scale and turned over the flexible transparent plates of the rule, exponents are affixed on to the members of the scale of the stationary body; there are a central line on the transparent cover and a middle dividing line on the middle of the slide, together with printed columns of figures or other customary signs upon the principal slide and a supplementary slide, a clamp secures a flexible transparent cover (put between covers upon the rule) to the back of the auxiliary scale; suitable marks are adopted for showing that the figures upon the left-hand portion of the slide-rule have values equal to one-tenth of those upon the right-hand portion. Confer also No. 24,078 of 1897.

7,608.—ELECTRODES FOR ARC LAMPS: *E. Rasch.*—Refractory oxides are used for electrodes that will conduct only after their preliminary heating by a flame, a resistance, or spark-discharge. They may be composed also of oxides of chromium, iron, copper, uranium, or other materials that will conduct to a certain degree at an ordinary temperature, and the application of a high electrical pressure will start the arc between them. The electrodes should be highly heated after they have been moulded, and for their vitrification they should contain metallic salts or fluxes. For other means of starting the arc it may be put between auxiliary electrodes formed of carbon, carbides, silicides, oxides, or other conductive bodies, mixed—it may be—with metallic salts.

7,657.—AN ATTACHMENT FOR ELECTRICAL LAMPS, &c.: *W. T. Burbey.*—The opening that takes the cord-grip of a flexible conductor is serrated, or a projection from the holder is placed in engagement with a groove in the grip, so that the grip, which is held with a screw-cap, shall not be liable to be turned in the ceiling-rose or similar lamp-holder.

7,662.—A COMBINATION, OR PERMUTATION, LOCK: *W. S. Monroe & J. W. Cross.*—A follower works the latch bolt from without, and a handle upon the spindle works it from within, when some of the pins have been pressed inwards for their disengagement from the locking-plate the turning of a knob operates the follower, but if one tries to turn the knob when the proper pins have not been pressed, the tumbler becomes turned so as to force a spring against a pivoted stud and thereby close an electrical circuit for the sounding of an alarm; a handle on the inside of the door will turn the stud out of action, the block upon which the stud is pivotted is held in its place with a spring which also acts upon the lever which regulates the lock-bolt; for reversing the mechanism so as to serve for right and left hand doors the bolt, &c., can be removed and turned over, the tumbler and follower having equally-sized bosses, whilst some of the pins can be withdrawn and reversed if one wishes to vary the combination; a pin-and-slot contrivance restricts the motion of the locking-plate which can be turned far enough for withdrawal of the bolt, but not far enough for the entry of the pins into fresh holes.

MEETINGS.

SATURDAY, AUGUST 24.

Northern Architectural Association.—Visit to South Shields.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 9.—By WILLSON & PHILLIPS (at Chelmsford).

Danbury, Essex.—Danbury Common, Pensioner's Box, c.	£185
Runwell, Essex.—Cole Hill, cottage and 1 a., c...	110
Stock, Essex.—Birch-lane, &c., five cottages, f. ..	340

August 10.—By T. W. GAZE & SON (at Norwich).

Little Plumstead, Norfolk.—The Hall Farm, 210 a. 1 r. 16 p., f.	2,850

By T. RULE OWEN & SON (at Tenby).

Tenby, Pembroke.—The Trevayne Estate, 310 a. 2 r. 23 p., f.	8,500
Saint Issells, Pembroke.—The Hean Castle Estate, 86 a. 1 r. 18 p., f.	4,250

August 12.—By EDWIN J. GILDERS (at Clacton).

Clacton-on-Sea, Essex.—Beaconsfield-rd., Rock-view, f.	450
Holland-rd., Holland Lodge, r. 132*l.* 10s., f. ..	2,450
Marine Parade, plot of land, f.	950
Penfold-rd., four plots of land, f.	810
Tower-rd., corner plot of land, f.	305

August 13.—By JONES, SON, & DAY (at Masons' Hall Tavern).

Walthamstow.—Black Horse-rd., the Union Jack off-licensed premises, u.t. 47 yrs., r. 60*l.*, with goodwill	3,500

By W. H. STICKNEY (at Hull).

Skeffling, Yorks.—East Field, three closes of arable land, 22½ a., f. and c.	455

August 14.—By BEALE & CAPPS.

Notting Hill.—Ladbroke-grove, Ladbroke Hall, u.t. 63 yrs., g.r. 4*l.* 1s. (two leases), with licence, as a going concern; also 126, Ladbroke-grove, u.t. 15 yrs., r. 110*l.*, rising to 120*l.*	2,900

By CHADWICK & SONS.

Pentonville.—7, 9, and 11, Granville-sq., u.t. 25¼ yrs., g.r. 6*l.*, r. 150*l.*	1,170

By E. W. RICHARDSON & SON.

St. Pancras.—23, Argyle-st., u.t. 41½ yrs., g.r. 10*l.*, r. 91*l.*	465

August 15.—By BISLEY & SONS.

Bermondsey.—17 and 18, Cadbury-rd., u.t. 64¾ yrs., g.r. 9*l.*	550
Ilford.—187 and 189, Thorold-rd., u.t. 96 yrs., g.r. 11*l.*, r. 52*l.*	390
Manor Park.—60, 62, and 64, Lawrence-av., f. ..	800

By LINNETT & LANE.

Harlesden.—119 and 121, Fortune Gate-rd., u.t. 93 yrs., g.r. 11*l.*	560

By STIMSON & SONS.

Finchley.—1 to 4, Field's-cottages, f.	825
High-rd, block of land, area ½ a., f., l., and c.	735
High-rd, Wentworth House, f., r. 75*l.*	1,700
High-rd., Lyndon House, f., r. 60*l.*	1,205
High-rd., Catherine Villa and Catherine Cottage, f.	1,100
Whetstone, Middlesex.—Athenæum-rd., two cottages and ½ a., f.	405
Barnet.—May's-lane-rd., block of freehold building land	160
Shephall, Herts.—Broadwater, two cottages and 2 a. 1 r. 16 p., f. and c.	405
Caddington, Beds.—The Rose and Crown b.-h., f., r. 25*l.*	450
Nunhead.—58, 62, and 64, Evelina-rd., u.t. 72 yrs., g.r. 13*l.* 10s.	840
Peckham.—50, Harders-rd., u.t. 62½ yrs., g.r. 4*l.* 5s. 8d., r. 30*l.*	340
Norwood.—18, Anerley-rd., u.t. 49 yrs., g.r. 43*l.*, r. 100*l.*	500
Wimbledon.—7, Lower Downs-rd., u.t. 81 yrs., g.r. 12*l.*, e.r. 40*l.*	310

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 11 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 6	,,	at railway depôt.
Red Wire Cuts	1 14 6	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 4 6	,,	,, ,,
Do., Bullnose	4 9 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 2 6	,,	,, ,,

PRICES CURRENT (*Continued*).

GLAZED BRICKS

	£ s. d.		
Best White and Ivory Glazed Stretchers	13 0 0	per 1,000	at railway depot.
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
plays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.		
Thames and Pit Sand	7 3	per yard,	delivered.
Thames Ballast	6 0	,,	,,
Best Portland Cement	34 6	per ton,	delivered.
Best Ground Blue Lias Lime	25 6	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard,	delivered.
Stourbridge Fire-clay in sacks,	28s. 0d.	per ton at rly. dpt	

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube,	deld. rly. dep't.
Bath ,,	2 7	,,	,,
Farleigh Down Bath	2 8	,,	,,
Beer in blocks	2 6½	,,	,,
Grinshill ,,	2 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks	2 2½	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4½	,,	,,
Hard York in blocks	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super.	at rly. depôt
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.	deld. rly. depôt.
,, ,, ,, 6-in sawn both sides landings	2 7	per ft. super.	deld. rly. depôt.
,, ,, ,, 3-in. do.	1 2½	,,	,,

SLATES.

	£ s. d.		
in. in.			
20×10 best blue Bangor	11 5 0	per 1000 of 1200	at rly. dep.
,, best seconds	10 15 0	,,	,,
16× 8 best ,,	6 2 6	,,	,,
20×10 best blue Portmadoc	10 18 0	,,	,,
16× 8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green	11 2 6	,,	,,
16× 8 ,, ,,	6 15 0	,,	,,
20×10 Permanent green	10 0 0	,,	,,
16× 8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles	42 6	per 1,000	at rly. depôt.
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	more than battens.
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

[See also next page.

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Destructor Buildings, &c., Throstle-street	Blackburn Corporation	W. Stubbs, Civil Engineer, Municipal Buildings, Blackburn	Aug. 26
Street Works	Walker (Northumberland) U.D.C.	T. W. Laycock, Surveyor, Church-street, Walker	Aug. 27
Tar Pavement, Seaton Carew	West Hartlepool Corporation	J. W. Brown, Borough Engineer, Hartlepool	do.
Street Works, &c.	Withington (Lancs) U.D.C.	A. H. Mountain, Civil Engineer, Town Hall, Withington	do.
Additions to Workhouse	Belfast Union Guardians	Young & Mackenzie, Architects, Belfast	do.
Iron Buildings	Manchester Corporation	T. E. Hughes, Town Hall, Manchester	do.
Chapel, Royston, near Barnsley		J. Oldroyd, Architect, Royston	do.
Public Offices, &c.	Felling (Durham) U.D.C.	H. Miller, Civil Engineer, Felling	do.
Electricity Works, Dee Village	Aberdeen Town Council	A. Smith, Engineer, Cotton-street, Aberdeen	do.
*New Sluice	Mr. J. E. Curtis	J. Vevers, 31, Effra-road, Brixton	Aug. 28
Cast-iron Pipes (469 tons)	Chorley (Lancs) R.D.C.	A. Jolly, Surveyor, 9, High-street, Chorley	do.
Additions to Schools, Swinefleet, near Goole	Reedness U.D. School Board	F. Chambers, Architect, Goole	do.
House, &c.	Bedlington Coal Company	J. G. Weeks, Bedlington, Northumberland	do.
Alterations, &c., to Offices, Dewsbury	Messrs. Tennant & Nevin	F. W. Ridgway, Architect, Borough Chambers, Dewsbury	do.
Shed, Bankfield Mills, Mirfield, Yorks		J. Kirk & Sons, Architects, Huddersfield	Aug. 29
Additions to Hall, Egremont	Oddfellows' Society	J. Cowan, Surveyor, Egremont, Cheshire	do.
Granite	Peterborough Town Council	J. W. Walshaw, Surveyor, Guildhall, Peterborough	do.
Cottage	Ramsgate Corporation	T. G. Taylor, Borough Surveyor, Albion House, Ramsgate	do.
Swimming Bath, &c.	Reading Corporation	J. Bowen, Civil Engineer, Town Hall, Reading	do.
Widening Streets, Brook-street, &c.	Basingstoke Town Council	G. Fitton, Borough Surveyor, Basingstoke	do.
Seven Lattice-roof Girders	Huddersfield Corporation	Town Clerk, Town Hall, Huddersfield	Aug. 30
Tramway Works	Glasgow Corporation	J. Young, 83, Renfield-street, Glasgow	do.
Twelve Houses, Lambton-street, Langley Park	Consett Iron Company, Ltd.	C. R. Oliver, Architect, Consett, Durham	do.
Two Blocks of Shops, Rodley, Leeds	Mr. S. Fox	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Reservoir, Read	Burnley R.D.C.	S. Edmondson, Civil Engineer, 18, Nicholas-street, Burnley	Aug. 31
Lecture Hall, Ballygilbert, Ireland		Rev. W. Dickson, Helen's Bay, Ballygilbert	do.
Street Works, Willow Hall-street, Halifax		G. Buckley & Son, Architects, Tower Chambers, Halifax	do.
Residence, Glencrow, Moville, Ireland		M. A. Robinson, Civil Engineer, Richmond-street, Londonderry	do.
Road Materials	Bromley (Kent) R.D.C.	E. Hazlehurst, 98, High-street, Bromley	do.
Police Station, Whitley		J. Cresswell, Architect, Moot Hall, Newcastle	do.
Rectory, Belmullet, Ireland		J. S. Cairns, Dillon-terrace, Ballina	do.
House, Great Thurlow, Suffolk		A. J. Simpson, Civil Engineer, Haverhill, Suffolk	do.
Six Houses, Wombwell, Yorks	Mr. A. Pashley	J. Robinson, Architect, Wombwell, near Barnsley	do.
Three Houses, Wombwell	Mr. A. Gibbon	do.	do.
Three Houses, Hough-lane, Wombwell	Mr. T. Hargate	do.	do.
Fifteen Houses, Cwmpark-road, near Treorchy	Greenfield Building Club	Secretary, Park Hotel, Cwmpark, Rhondda Valley	do.
*New Bathrooms and Iron Staircase	Dunmow Union	Richard Creed, Architect, 11, Finsbury-circus, E.C.	Sept. 2
*Road Materials and Portland Cement	The Tankerton Estate, Limited	A. A. Kemp, Surveyor, Whitstable	do.
Bridge, Anderson-place	Leith Town Council	Burgh Surveyor, Town Hall, Leith	do.
Station Buildings, Doune	Caledonian Railway Company	J. Blackburn, 302, Buchanan-street, Glasgow	do.
Sewers, Kincardine-on-Forth, N.B.	Dunfermline Committee	W. A. B. Laing, Civil Engineer, 13, George-street, Edinburgh	do.
Additions, &c., to House and School, Ballintuim	Kirkmichael School Board	J. M'Kenzie, School Board Offices, Kirkmichael, N.B.	do.
Water Tower, Royle's Head	Halifax Corporation	J. A. Paskin, Civil Engineer, 22, George-street, Halifax	do.
River Wall, &c., Mill Walk	Nuneaton U.D.C.	J. S. Pickering, Civil Engineer, Council Offices, Nuneaton	do.
Twelve Houses, Cliviger, near Burnley		T. H. Mitchell, Architect, Todmorden	do.
Residences, Stabling, &c., Queen's-road, Coventry	Messrs. Hewitt & Hibell	Harrison & Hattrell, Architects, 28, Hertford-street, Coventry	do.
Stone Wall, &c.	Darlington Corporation	Borough Surveyor, Town Hall, Darlington	do.
Covered Way at Workhouse	Guildford Guardians	Peak & Lunn, Architects, 36, High-street, Guildford	do.
Mission Hall, Ilkley	Trustees	Adkin & Hill, Architects, Prudential Buildings, Bradford	do.
*Extension of Grammar School, Bridlington	The Governors	Botterill, Son & Bilson, Architects, Hull	Sept. 3
Granite	Carshalton U.D.C.	W. W. Gale, Civil Engineer, High-street, Carshalton	do.
Coastguard Station, Knightstown, Ireland	Office of Works	Secretary, Office of Public Works, Dublin	do.
*Drainage Works, Pembury	Tonbridge R.D.C.	W. V. Graham, Engineer, 5, Queen Anne's Gate, S.W.	do.
*Concrete Paving, &c.	Uckfield U.D.C.	Offices of Council, Public Hall Chambers, Uckfield	do.
Paving, &c., Amy-street	Middleton (Lancs) Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton	Sept. 4
Harbour Works	Macduff Town Council	J. Barron, Civil Engineer, 1, Bon Accord-street, Aberdeen	Sept. 5
Refuse Destructors	Mansfield Corporation	R. Hammond, Civil Engineer, 64, Victoria-street, S.W.	do.
Washhouses, &c., Stockbridge	Edinburgh Corporation	R. Morham, Architect, City Chambers, Edinburgh	Sept. 7
*Repairs, &c., to 70-74, Pentonville-road, N.	Metropolitan Asylums Board	Offices of the Board, Embankment, E.C.	do.
Road Works, Bagthorpe	Nottingham Union Guardians	A. Marshall, Architect, King-street, Nottingham	Sept. 9
*Lavatory Buildings	Hertfordshire County Council	County Surveyor, 41, Parliament-street, S.W.	do.
*Flooring over Bath Pond of Swimming Bath	Wimbledon U.D.C.	R. J. Thomson, Architect, 47, Hill-road, Wimbledon	Sept. 10
*Artisans' Dwellings	Brighton Town Council	Borough Engineer, Town Hall, Brighton	Sept. 12
*Erection of Shed	Lewisham Council	Surveyor, Town Hall, Catford	do.
*Erection of Cottage	do.	do.	do.
*Construction of Sewer	do.	do.	do.
*New Harbour Offices	Swansea Harbour Trust	Harbour Offices, Swansea	Sept. 18
Additions to Police Station, South Queensferry	Linlithgow Standing Jt. Commte.	J. G. B. Henderson, Linlithgow	No date
Addition to School, near Abergavenny	Governors	B. J. Francis, Architect, Abergavenny	do.
Block of Flats, Sydenham		P. C. Davies, Architect, Rosendale-road, Herne Hill	do.
Restoration of Church, West Dereham		H. Green, Architect, Norwich	do.
Alterations to Romney House, Kendal	Mr. E. Hetherington	J. Hutton, Architect, Kendal	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Architectural Assistant	Hull Corporation	175*l.* per annum	Sept. 2
*Assistant in Borough Engineer's Office	Barrow-in-Furness Corporation	144*l.* per annum	Sept. 7
*Sanitary Inspector	Metro. Borough of Bermondsey	130*l.* per annum	Sept. 9
*Clerk of Works	Cannock Union	Not stated	Sept. 10
*Assistant Examiner in Patent Office	Civil Service Commission	Not stated	Sept. 19

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* —. *Contracts, pp.* iv. vi. viii. x. *&* xix. *Public Appointments, pp.* xvii. *&* xix.

PRICES CURRENT (*Continued*).
WOOD.

Joiners' Wood.	At per standard. £ s. d.	£ s. d.
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0

PRICES CURRENT (*Continued*).
WOOD.

Joiners' Wood.	At per standard. £ s. d.	£ s. d.
Petersburg: first yellow deals, 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 12 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 0 0	16 0 0

PRICES CURRENT (*Continued*).
WOOD.

Joiners' Wood.	At per standard. £ s. d.	£ s. d.
White Sea and Petersburg:—		
First white deals, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0

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PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders ,, ,,	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 17 6	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 4½	- - -
SOLDER—Plumbers' ,,	0 0 7	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 0	per ton delivered.
Fine ,,	38 0	,, ,,
Coarse Keenes and Parian cement	55 0	,, ,,
Fine do. do.	60 0	,, ,,
Robinson's Fireproof Cement	50 0	,, ,,
Do. Fine white ,,	55 0	,, ,,
(Exclusive of the ordinary charge for sacks.		
Whiting	27 0 to 30 0	,,

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
,, ,, fourths	2½d.	,, ,,
21 oz. thirds	3½d.	,, ,,
,, ,, fourths	3¼d.	,, ,,
26 oz. thirds	5d.	,, ,,
,, ,, fourths	4½d.	,, ,,
32 oz. thirds	6d.	,, ,,
,, ,, fourths	5½d.	,, ,,
Flatted sheet, 15 oz.	3½d.	,, ,,
,, ,, 21 ,,	4½d.	,, ,,
½ Hartley's Rolled Plate	3d.	,, ,,
¼ ,, ,, ,,	3½d.	,, ,,
⅛ ,, ,, ,,	4d.	,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Boiled ,, ,, in pipes	,,	0 3 0
,, ,, ,, in barrels	,,	0 3 1
,, ,, ,, in drums	,,	0 3 3
Turpentine, in barrels	,,	0 2 3
,, in drums	,,	0 2 5
Genuine Ground English White Lead	per ton	22 0 0
Red Lead, Dry	,,	22 10 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 18 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. B.—R. & W. D. (Amounts should have been stated).

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BIGGLESWADE.—For the erection of showrooms, for Messrs. Maythorn & Son. Mr. E. Twelvetrees, architect, Sandy. Quantities by Mr. Gilbert W. Booth, F.S.I., Adelphi-street, W.C. :—

L. Rootham	£1,809	W. Wade	£1,629
H. Martin	1,750	Stones & Skelton	1,580
Rainsford Bros.	1,746	French & Co.	1,545
J. Hinkin	1,685	J. Potter, Bedford*	1,526

BOURNE END.—For the erection of two houses with shops, and a lock-up shop, for Mr. Jesse Andrew. Mr. Alexander H. B. Ellis, surveyor, 89, Constantine-road, Hampstead, N.W. Quantities by the surveyor :—

C. Simmons	£1,520 10 0	Carter & Son	£1,399 0 0
A. Grimsley	1,450 0 0	Henry Flint	1,347 0 0
G. Brown	1,412 4 3	Harry Harris*	1,325 0 0

[Surveyor's estimate, £1,202.]

CANNOCK.—For the erection of infirmary buildings for forty-eight patients, for the Union Guardians. Mr. Ashton Veall, architect, 84, Darlington-street, Wolverhampton. Quantities by architect :—

Willcock & Co.	£5,534 15 0	J. Reynolds	£4,896 0 0
F. L. Jones	5,365 0 0	E. Whittingham	4,845 0 0
S. Wootton	5,314 13 0	Guest & Sons	4,744 0 0
M. B. Anderson	5,166 0 0	W. H. Gibbs	4,685 0 0
F. Sprenger	5,1 9 0 0	H. Gough	4,640 0 0
W. Hopkins	4,995 0 0	Thos. Mason, Hednesford*	‡4,595 0 0
A. Williams	4,961 12 10		
Espley & Sons	4,940 0 0		

‡ Additional cost if wood block floors, £89 16s.

CARDIFF.—For additions to jeweller's shop, business premises, &c., St. Mary-street, for Messrs. Heitzman & Sons. Messrs. Veall & Sant, architects. Quantities by the architects :—

Turner & Sons	£974 0 0	W. T. Morgan	£800 0 0
Thomas & Co.	900 5 6	Couzens & Co.	798 15 0
Shepton & Son	892 3 0	Melhuish Bros.	795 18 0
Lattey & Co.	865 0 0	M. O. Williams	750 13 9
G. Hallett	858 10 0	F. Small*	685 0 0

[All of Cardiff.]

CUPAR-FIFE.—For renovations, &c., to Logie mansion and offices. Mr. Henry Bruce, architect, County Buildings, Cupar-Fife :—

Masonry.

C. Henderson	£77 13 11	Carmichael & Robertson, Logie and Dairsie*	£73 8 0
D. Ritchie	63 12 3		

Joinery.

W. Buist	£44 18 4	W. Boyd	£33 11 8½
C. Henderson, Balunello*	35 14 6	W. Scott	33 0 0
J. Jack	35 4 8	A. W. Haggart	31 10 8
		A. Robertson	30 0 0

Plumbing.

D. Donaldson	£56 9 8½	R. Bell	£47 3 7
Betsworth & Barlow, Newport, Fife*	47 13 7	A. Stewart	45 0 0

Plastering.

F. Batchelor	£17 5 0	Robb & McIntosh	£11 18 1
Jackson & Adamson	12 15 2	R. Arthur, Dundee and Cupar*	10 3 2

Slating.

F. Batchelor	£38 15 0	J. Stirrier, Newport, Fife*	£28 0 0
Jackson & Adamson	30 17 4	R. Arthur	27 9 7
C. Brand	29 5 0	Robb & McIntosh	27 4 2
T. Black	28 6 8		

Painting.

W. Fenton, Newport, Fife*	£50 15 6	J. W. Carr	£46 14 5½
		D. Reid	30 10 0

EAST CLANDON.—For additions to schools, for the Managers. Mr. Byron Noel, surveyor, Ockham, Woking :—

W. G. Edwards	£529
J. Pullen, Ripley*	£383

FLAMBOROUGH.—For the erection of a house and stabling, for Mr. John Hall. Mr. Joseph Shepherdson, architect, 15, Manor-street, Bridlington :—

Barr & Booth	£703 0 0	John Lawden, Bridlington*	£630 0 0
Yeomans	698 19 0		
E. Wilson	697 4 10	Thos. Nordass (withdrawn)	620 17 0
W. Barnes	686 0 0		
Geo. Hall	680 0 0		
Sampson & Liddall	660 0 0		

GLENGARIFF.—For additions to the "Eccles" Hotel. Mr. A. Hill, architect, 22, St. George's-street, Cork :—

S. Hill	£5,641	W. H. Jones, Dunmanway*	£5,090
W. O'Connell	5,580		

HARROGATE.—For supplying and fixing constructional and sundry ironwork at the new Kursaal, for the Corporation. Mr. Robert J. Beale, architect. Quantities supplied :—

Keay, Ltd.	£6,825 0 0
Wood & Co.	5,958 0 0
Power, Power, & Co.	5,938 0 0
Dean, Ransome, & Co.	5,176 3 10
Young & Co., Ltd.	5,165 3 1
Wright & Son	4,957 0 0
Heenan & Froude	4,904 10 0
Bagshaw & Sons	4,869 10 0
Baker & Co.	4,804 4 9
Lockerbie & Wilkinson	4,700 1 9
Hodgson & Co.	4,500 0 0
O. Atkinson	4,487 0 0
Richards & Co.	4,219 18 10
Pierson & Co.	4,075 0 0
Schofield & Hancox, Manchester*	3,741 0 0

HUCKNALL HUTHWAITE (Notts.).—For the erection of two blocks of schools, for the School Board. Mr. J. E. Goodacre, architect, 4, Stockwell-gate, Mansfield :—

Houston & Co.	£6,971	F. Lee	£6,638
J. F. Price	6,777	A. B. Clarke, Nottingham*	6,210
T. Barlow	6,770		

LLANELLY.—For erecting a villa at New-road, Llanelly, for Mr. R. W. Evans. Mr. T. Arnold, architect, Llanelly :—

John Evans	£1,263	Brown, Thomas, & John	£999
G. Mercer	1,080	Howell & Son, Ltd.*	997

LONDON.—For the pulling-down and rebuilding of premises, High-street, Marylebone. Mr. J. Randall Vining, architect and surveyor, 89, Chancery-lane, W.C. :—

Lawrance & Sons	£7,128	H. L. Holloway	£6,483
Patman & Fotheringham, Ltd.	6,787	J. & C. Bowyer	6,436
Holloway Bros.	6,693	Black & Son	6,120
Johnson & Co., Ltd.	6,554	R. S. Buckeridge*	5,995
[Architect's estimate	£6,000.]		

[*See also next page.*

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BEXHILL.—For Street Works for the Urban District Council. Mr. G. Ball, Engineer, Town Hall, Bexhill :—

Contract No. 1.

	Little Common-road.	Chantry-lane.	Hastings-road.	
	£ s.	£ s.	£ s.	£ s.
Stephen Carey	746 10	316 10	1,112 15	2,175 15
Peerless, Dennis, & Co.	732 0	357 0	1,068 0	2,157 0
P. Jenkins	755 0	258 0	1,104 0	2,117 0
Thos. Adams, Wood Green, N.*	690 0	335 0	1,035 0	2,060 0

Contract No. 2.

	De La Warr-road.	Dorset-road.	Fairmount-road.	Elmstead-road.	
	£ s.	£ s.	£ s.	£ s.	£ s.
Stephen Carey	1,507 10	1,201 15	1,190 10	952 15	4,852 10
Thos. Adams	1,497 0	1,197 0	1,159 0	057 0	4,810 0
P. Jenkins	1,410 0	1,250 0	1,076 0	825 0	4,561 0
Peerless, Dennis, & Co.*	1,239 0	1,187 0	1,168 0	894 0	4,488 0

OXTED (Surrey).—For the erection of Shire horse stud stables at Brook Farm, for Mr. Max Michaelis. Messrs. F. S. Brereton & Son, architects and surveyors, 292, High Holborn, W.C. Quantities by Mr. E. G. Hardcastle, 61, Chancery-lane, W.C. :—

Wm. Worssell	£4,189	R. Dartnell	£3,419
G. E. Loveland	3,622	J. Carmichael*	3,393
Josolyne & Young	3,497		

RUGBY.—For additions and improvements to St. Andrew's Boys' Schools. Mr. E. H. Lingen Barker, architect, Hereford :—

Hollowell	£1,510 0 0	Sturgess & Son	£1,314 10 0
Harris	1,535 0 0	Bax & Dawson	1,253 0 0
Linnell & Son	1,460 0 0	Tate & East-wood, Market Harborough*	1,193 19 4
Foster & Dicksee	1,444 0 0		
Hopkins & Son	1,435 6 0		

TANDRIDGE (Oxted, Surrey).—For farm buildings stables, and cottage at Court Farm, and farm buildings at Tandridge Court, for Mr. Max Michaelis. Messrs. F. S. Brereton & Son, architects and surveyors, 292, High Holborn, W.C. Quantities by Mr. E. G. Hardcastle, 61, Chancery-lane, W.C. :—

Wm. Worssell	£5,495	F. & H. F. Higgs	£5,210
Josolyne & Young	5,456	James Carmichael	4,874
Wm. Akers & Co.	5,269	E. J. Saunders*	4,840
Wm. Smith	5,264		

TEIGNMOUTH.—For additions to the isolation hospital, for the Urban District Council. Mr. C. Jones, surveyor, Town Hall, Teignmouth :—

Mingo & Boone	£1,435	J. Cornelius	£1,185
E. Andrews	1,210	F. Francis	1,112

WALSALL.—For the erection of a boiler house, &c., Pleck-road, for the Town Council. Messrs. Bailey & McConnal, architects, Bridge-street, Walsall :—

Marshall	£4,226	W. & J. Webb	£3,668
Smith & Son	4,050	Guest	3,580
Sapcote & Son	3,989	James	3,267
Mallin	3,926	Tildesley	3,228
Harley & Son	3,723	Gibbs, King's Heath*	3,200
Wistance	3,669	Crisp	3,015

WEMBLEY.—For the erection of shop and premises, No. 23, The Mace, Wembley, for Mr. H. Honour. Mr. Arthur W. Osborn, architect, 90, Queen-street, Cheapside, E.C. Quantities by Mr. W. James Pamphilon, 21, Finsbury-pavement, E.C. :—

Thompson & Son	£2,593 1	W. Goddard, jun.	£1,997 0
Burman & Sons	2,500 0	Sutton & Styles	1,975 0
Kiddle & Son	2,400 0	J. Watt	1,925 0
Freeman & Barber	2,150 0		

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The Builder.

VOL. LXXXI.—No. 3056. AUGUST 31, 1901.

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The English Renaissance.

THE monumental work on the architecture of the English Renaissance,* on which Mr. Belcher and Mr. Macartney have been at work for some time, and the first numbers of which have already been noticed in our pages,† has now appeared in complete form in two large and handsome folio volumes. We are still of opinion that the title of the book is a misnomer, and is confusing our architectural nomenclature. The period selected commences with the work of Inigo Jones, and that, in our view, was the commencement of Renaissance architecture in England. The sub-title runs "Domestic Buildings erected subsequent to the Elizabethan Period." "Domestic buildings" is not a strictly accurate definition, as the works illustrated include Greenwich Hospital, Trinity College Library, Abingdon Town Hall, and other buildings which are certainly not domestic. That is a minor matter: but the special reference to "Elizabethan" implies that the authors consider Elizabethan as Renaissance architecture, and the work commencing from Inigo Jones as "later Renaissance." Now we entirely decline to regard Elizabethan as "Renaissance" architecture. It is Elizabethan, and it represents a phase of architecture peculiar to this country, which is not to be found elsewhere and which is much better distinguished by the term hitherto conventionally assigned to it. Elizabethan architecture is a picturesque possession of our own; it is not only peculiar to England, but it arose out of circumstances peculiar to England. The Perpendicular Gothic which immediately preceded it is also an indigenous phase of architecture, represented by nothing on the Continent. Elizabethan architecture is the result of the reminiscence of that phase combined with the echoes of the Italian Renaissance movement which, in consequence of the insular position of this country and the slow travel of artistic influences with us in those days, reached us at first only in a piecemeal manner, and affected details without affecting the English style of architecture as a whole. Hence this reposeful, rich, picturesque *mélange* of late Gothic and patchwork Renaissance detail which we have learned to call Elizabethan, and which is an essentially distinct thing from Renaissance.

For the distinction is not one of words only; it concerns the whole architectural treatment of a building—the whole conception of architecture as an art. Renaissance architecture means the forms and principles of Classic, and especially of Roman architecture, which followed in Italy the revival of classical learning. And, apart from the mere revival and imitation of the Classic orders, which is its outward and visible sign, it means the conception and treatment of a building as a uniform whole, dominated by one paramount idea which has its basis in the plan, and which rules the whole design. Now Elizabethan architecture never rose to that intellectual height. Its plans are for the most part naïve, and deficient in unity of conception. The real power of Renaissance architecture lay in this, that it grasped the conception of a building as one whole and symmetrical idea. We neither forget nor underrate all that modern architectural criticism has had to say in regard to the deadening and academic effect of the Classic revival and its adherence to precedents of antique detail; of its unsuitability to our climate; of its want of life and variety in comparison with mediæval detail. In all that criticism there is much truth. But the great thing which the Renaissance revival brought with it was this power of unity of architectural conception. Italy brought it to the modern world; and a century or so later Inigo Jones brought it to England. We never had it before him. His plan of Whitehall Palace was a kind of architectural conception of which there is no previous example on our shores. He was the leader of the English Renaissance.

Therefore, the title of the book before us should have been "Renaissance Architecture in England." What would be properly called our "later Renaissance" would be the Georgian architecture—also peculiar to this country, and which represents the decadence of the Italian Renaissance—dry, stiff, and formal; destitute of the large manner and dignity of the Renaissance in its pristine vigour, though it still retains some of the Renaissance characteristics of unity and comprehensiveness of design.

An illustrative book of English Renaissance architecture, in the true signification of the word, would to our thinking be more instructive if the examples were arranged in chronological order. No attempt has been made at this in Messrs. Belcher and Macartney's book. The dates of nearly all the examples illustrated are known and are given; but the sequence of the illustrations has no reference whatever to date. This we cannot help also regarding as a defect in the book, though it is one very characteristic of the present day. In this as in other cases, to produce a collection of fine illustrations seems to be the principal aim, without taking any trouble to arrange them in such an order as to be historically illustrative. It would have been so exceedingly easy to do this, being merely a question of arranging or numbering the plates according to the sequence of date, that one can only suppose that the authors considered it of no consequence; a conclusion in which we cannot agree. One object of such a collection should be to illustrate the development and decadence of a style; not merely to bind together a series of illustrations without method or system.

These are the defects of what is nevertheless a very fine architectural publication, containing a collection of examples illustrating almost all the types of English Renaissance architecture, from the palace to the street house. In their Introduction, the authors do not omit to recognise the quality of unity of design which we have alluded to as one of the most special characteristics of Renaissance architecture. Among its developments, they observe, "there is the bringing to maturity the well-balanced design; a complete project, with every part rightly ad-

* "Later Renaissance Architecture in England; a Series of Examples of the Domestic Buildings erected subsequent to the Elizabethan Period." Edited, with introductory and descriptive text, by John Belcher, A.R.A., and Mervyn E. Macartney. London; B. T. Batsford; 1901.

† See *Builder* of July 16, 1898.

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justed and with carefully considered outline. It was this striving after unity, which may be said then to have reached its most complete development; indeed, it went beyond the mansion and extended to its environment." There could not be a finer example of this feeling in architectural design, which includes the placing and grouping of the buildings as well as their detailed architectural treatment, than is to be found in Wren's working out to its completeness of the plan of Greenwich Hospital, which forms the first illustration in the book. The wide spacing of the two front blocks, leaving the rear blocks partly visible behind them, and the introduction of the domes at the inner angles of the latter, so as to bring them into full view from the front quadrangle, combine to form one of the stateliest of plans; and although a dome seems naturally and generally a central feature, we are reminded here how it may be effectively used at an angle of a block of building. In fact, without following any precedent, Wren placed his principal features here exactly where they would be most effective in relation to the whole scheme. Take away the outstanding front blocks, and the domes might seem to be weakly placed—one might think that they ought rather to be in the centre of the entrance façades. Taken in connexion with the whole plan, they are exactly where they ought to be, forming prominent objects as seen from the great front court, and standing as a stately commencement or portal to the narrower avenue between the two rear blocks. While referring to the plan, however, we cannot but comment upon the difference between this and some other recent architectural publications, in the matter of plans, as compared with the practice of earlier architectural illustrators. Campbell in the "Vitruvius Britannicus" gives all the plans on the same scale as the elevations. Here, as well as in Mr. Gotch's recent publication, we have no plans except small-scale blocks in the text; and the principal illustrations are not elevations but photographic views. We have no quarrel with these latter; by their means the reader is given a vivid idea of the actual look and character of buildings which he may never have seen; but we should certainly think it more complete if they were accompanied by plans to a large scale. The lack of these is another indication of the spirit of architectural illustration in the present day; it is all concerned with the picturesque effect of a building, not with illustrating its working out. We see the same at the Royal Academy, where architects are content to send, if any plan, merely a diminutive one in a corner of the drawing, and perhaps would not be accepted if they attempted anything else; whereas in France the plans are exhibited to the same scale as the elevations; and it would be the same in a French architectural publication. In this respect we have fallen below the level of Campbell and Kent; in a modern publication it seems to be sufficient if there is a plan just large enough to form a key to the general meaning of the photographic view—a plan, too, dissociated from the view and relegated to a back place in the explanatory text. That is certainly not an ideal system of architectural illustration; but it is what appears to suit the present demands.

In studying the illustrations of the buildings of a past age, we should endeavour to criticise them as we would criticise modern work, not to adopt an attitude of indiscriminate admiration. In this respect the remarks on the various examples are in a right spirit; the authors do not scruple to point out what they consider the defects and shortcomings of some of the buildings illustrated. The criticism on "The Great House, Burford"—the incongruity of effect of the vases planted on the top of the battlements, and the indiscriminate manner in which a pediment is got in, to break the line, without any constructional basis, is quite to the point. In fact Burford, as they remark, "is an example of the overlapping of Early and Late Renaissance work," or (as we should prefer to put it) of Elizabethan and Renaissance work; the general design is Gothic in feeling, but the newly arrived vase terminals of the Renaissance have been perched on it. We cannot agree with the comparative criticism as to Wilton House and Houghton. The authors say that "the Houghton front lacks the quiet dignity of Wilton, where more restraint is exercised in every part." Restraint may be carried too far, and we confess that we think Wilton rather over-rated; the name of Inigo Jones has cast a glamour over it. Its simplicity is pleasing no doubt, as well as the contrast afforded by the one bit of sculptural decoration introduced in the centre, but the end pavilions are very deficient in dignity. We have reproduced the view of Houghton (see plate), and we do not understand the meaning of the want of "restraint" complained of. With the exception of the cupolas, it can hardly be more simple, and it has a palatial dignity which is wanting in Wilton. The house, we are told, was designed by Campbell in 1723, but carried out by Ripley, who substituted the domes for the originally designed attic at each end. He certainly thereby made an improvement, and the whole effect is that of one of the most dignified mansions in England, and one which shows, too, what may be done in Renaissance architecture by the mere treatment of wall, windows, and cornice, without the decorative use of an order of columns or pilasters. Again, somewhat too much is surely made of Groombridge. It is a mean-looking brick house, with its high-pitched roofs and plain overhanging eaves; and the columned portico, so far from giving it the dignity it lacks, seems out of keeping with the rest of the elevation. Nor can we concur in the admiration expressed for the ceiling decorations of the drawing-room, said to be the one room of sumptuous character which the house possesses. The great ragged mass of realistic plaster fruit and flowers, running round the central oval compartment, has no redeeming quality but its boldness; it is bad ornament, with no principle of design in it at all, and entirely destitute of refinement. It has had imitators, however, in recent work. If people will imitate old Renaissance detail, let them at least imitate its beauties, not its faults. As an example of a far superior type of English Renaissance detail we have reproduced the plate of details of the Winchester School Hall, by Wren. We do not by any means agree that Wren always used "swags" and that kind of ornament well; there is no doubt, for instance, that a great deal of the exterior carved ornament of St. Paul's, in the way of floral festoons, is coarse and poor, as Ruskin has justly remarked; and good or bad, there is always the question whether it is really Wren's design, or only that of his carvers working out their own will in their own way. But in the case of the Winchester Hall there is no doubt that the disposition of the swags, forming a kind of frieze ornament, is Wren's own, and is very effective; and there is a severity of line about them, as shown in the detail drawing, which is very creditable to the carver, and far superior to the exuberant vegetation of the Groombridge ceiling. The treatment of the door and windows, for plain and simple work, can hardly be surpassed in dignity and refinement.

The employment of the order as a decoration, however we may theoretically condemn it, cannot be dissociated in the mind from the highest achievements of Renaissance architecture. For a building in this style of the largest and most imposing class, the use of the columnar order is really the condition of the greatest dignity of effect, as many of the illustrations in this book do practically testify. It may be misused, as it certainly is at Stoneleigh, where the majority of the treatment consists of windows and window dressings only, but where each angle of the building is formed by a great square fluted column or angle pilaster, running nearly the whole height of the building, with an Ionic capital. A modern architectural student who did this in a prize competition design would be condemned at once, both by his teachers and by most of his fellow students; it is absolutely bad; and yet one cannot exactly regret its existence in this instance; it is an interesting curiosity, and a variety from the general use of the order, and it gives a certain individuality to the building; only let not the young architect go and do likewise. On the other hand, in the plainer forms of domestic architecture, there are many examples in this book showing how much of dignity, and how much of the true and best characteristics of Renaissance architecture, may be realised without the introduction of the order. Houghton, already referred to, is an example on a large scale; an admirable example on a smaller scale in a less ambitious building, is that of Tyttenhanger. We entirely concur with the authors in their admiration for this house, which is an ideal specimen of architectural good taste and refinement displayed in a simple and severe manner and almost without the use of ornament. Another example is Inigo Jones's Raynham Hall, with its fine free design in the scroll gables; the authors call attention to one charming little detail in this, viz., the termination of the scrolls, just under the horizontal cornice, with a diminutive Ionic cap; a playful incident which in itself shows the original mind of the designer, and which seems to give the scroll the effect of supporting or, as the authors put it, "lifting" the gable. There is a good deal of general resemblance between the style of Raynham and that of a less well-known example, Swately Hall, in which the treatment of the gables is very similar, though the house as a whole has not the fine simplicity of Raynham. No architect's name is connected with it. In reference to Raynham, we may draw attention to the singularly delicate and graceful treatment of the doorway, shown in a separate plate to a larger scale, and especially the carved ornament over the door, which has a cha-

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racter of its own, different from that of the usual Renaissance carved ornament.

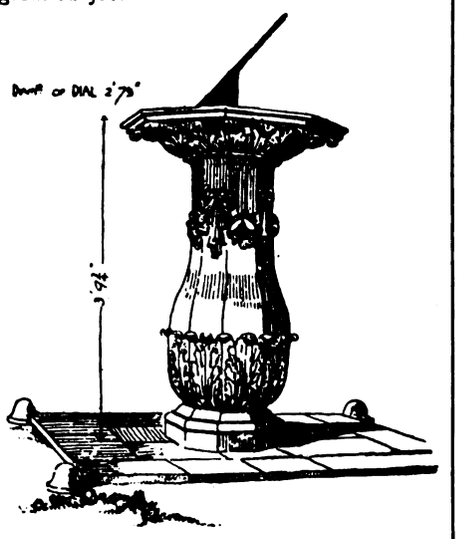
Out of the ordinary type of Renaissance ornament is also the carving in the semi-circular lunette over a door in Ashburnham House (Plate 20)—so much so that one is surprised to find no comment on it in the text. Though the detail of the leafage is Classic, in its general effect it reminds one of mediæval work.

Among the plans given in the text there is perhaps none of greater interest than that of Fenton House, Hampstead, originally known as the Clock House, probably from a clock which once occupied the circle in the blank window-space over the entrance. The architectural character is of the simplest—a brick house with plain flat-arched windows. The plan in its outer lines is a simple square, but the way in which it is divided up shows the hand of a genuine architect. A recessed porch with two columns is obtained in the centre of the entrance front, and the internal space on either side of this is turned into a closet on one side and an alcove on the other, opening respectively out of boudoir and study, which are lighted from the side. A similar contrivance is repeated with the back rooms, the closets or alcoves both in front and back going behind the fireplaces, which are thus kept away from the outer walls and from the influence of cold conducing to bad draught. This little plan is quite a study in its way. In the matter of chimneys the authors draw attention in another place to the manner in which architectural effect is combined with practical advantage in the massive treatment of the chimneys at Coleshill (Berkshire); "the size of the stack has no doubt insured (*sic*)* the warmth of the flues, so that no pots are required to make them 'draw' well." As a whole, Coleshill is a very fine house, another of the examples of Renaissance dignity obtained without the use of the order; in its general effect it may be compared with Houghton, though on a smaller scale and wanting the accentuation of the angles. The back entrance gateway, with its busts in circular niches, is singularly fine and dignified in effect, and unlike any other gateway of the kind that we can recall.

We do not altogether share the authors' admiration for the Radcliffe observatory. It is true that it is original and that its originality grows naturally out of the requirements of the plan, but on the whole it is rather a clumsily managed pile. The use of terracotta plaques as ornaments on the walls is a hint which might have received more attention. Bowood, Wilts, though the architecture taken in detail is not remarkable, is a fine example of the architectural grouping of house and garden in one design, and is well illustrated in this sense. We give a reproduction of the plate showing the mural fountain in the garden, not because there is anything of particular value in the architectural detail, but because the whole makes so fine a picture.

In spite of some mistakes which we have noticed, as to the view of Renaissance architecture implied in the title, and as to the small part which is given to plans in the illustrations, this is one of the most remarkable and fascinating works in architectural illustration which has appeared in our time. As before observed, the fine photographic illustrations from the actual buildings have all the effect of bringing them before us; and the number of examples of bold, fine, and monumental work thus brought before the eyes has a quite inspiring effect as we turn the pages. The work will probably not be without a considerable influence on the younger generation of architects. It should be added that in every respect of paper, printing, and general make-up and execution, the book is worthy of its great subject.

* "Ensured" is the correct expression in modern English, though "insured" was formerly used in the same sense. There are some other slips of language; it is odd that few architectural books are without them.



A Sundial from Wrest.

NOTES.

St. Paul's Cathedral.

IN a letter to the *Times* of Tuesday last, Dr. G. Johnstone Stoney, brother of Dr. Bindon B. Stoney, the well-known engineer, suggests that the subsidence which has been going on more or less since St. Paul's Cathedral was built is chiefly due to the removal and rearrangement of material by water travelling laterally through the lower layer of sand and over the surface of the London clay. It is undoubtedly the fact, as Dr. Stoney states, that underground water always exercises a solvent action on the mineral constituents of the material encountered, and is also to some extent responsible for the rearrangement of gravel, and the washing away of clay. He might have added that fine particles of sand are often carried away by the underground flow of water, an effect amply evidenced when pumping is practised in sandy soil. Dr. Stoney points out that any subsidence, attributable to causes such as those mentioned, must obviously be variable, as water generally chooses special paths in making its way from one place to another. The remedy which he proposes is to prevent any water from having access to the layer of sand immediately above the London clay by an intercepting sewer, probably best placed to the north and east of the cathedral, and by stopping the downward percolation of surface water to the same sand layer. Assuming this treatment were adopted it would be necessary to fence off a large area by sheet-piling as a first precautionary measure, and then to form a huge retaining wall or dam in addition to the drain. These works might possibly be conducted by closing St. Paul's Churchyard, but it is not improbable that operations would have to be extended into two or three adjacent streets. In either case the direct cost and the indirect loss to the community would be very great, and the further work of rendering waterproof the whole of the ground about the Cathedral would prove to be an equally expensive undertaking. Perhaps the proposed remedy might be effectual, but on this point we do not feel at all certain. One result that would inevitably follow would be the complete draining away towards the south of water now contained in the interstices of the sand layer. This process might possibly be attended by some futher settlement, although it may be reasonably held that the pebbles or grains of sand ought to be self-sustaining in a dry state. In any case, we think the course of treatment foreshadowed by Dr. Stoney is hardly practicable in the centre of so busy and closely built a city as London. A much more feasible and satisfactory scheme is to underpin the foundations of the cathedral, as suggested a week or two ago by Mr. Reilly. As the London clay is to be found at a depth of about 35 ft. from the surface, there would be no difficulty in providing the foundations of St. Paul's with means of support such as would be unaffected by hostile influences, whether of natural or artificial origin.

St. Bride's Church, Fleet-street.

A CLEARANCE which has been made for the re-building of St. Bride's-avenue on the south side of Fleet-street, affords for the while a good view of the church. Some alarm has been taken at the construction of some scaffolding around the upper portion of the steeple. We are enabled to state that a "steeple-jack" was lately employed to make an inspection of the fabric, and consequently upon his report it was deemed advisable to construct a staging for an examination to be made by Mr. R. Cuninghame Murray, architect to the vicar and churchwardens, of the third stage (counted from the tower) of the steeple. Mr. Murray has not yet drawn up his report. The custodians of the church, however, are apprehensive about the condition of the stonework of the third stage. Its eight arches, open to the weather, are tied within by iron clamps that pass through the stonework at the angles of the octagon; it is feared that the accumulation of rust from the corrosion of the iron bars is gradually tending to loosen the joints and to leave the stones slightly apart. Wren began the rebuilding of the church in 1680; the tower and steeple as originally built by him, in 1701-3, rose to a total height of 234 ft.; on June 18, 1764, it was struck by lightning and so greatly damaged that it was found necessary to take down and reconstruct 85 ft. of the masonry. In repairing the injury (at a cost of 3,000*l.*) Sir William Staines lowered the spire by 8 ft. In 1803 the steeple was again struck by lightning. In the storm of Friday, July 15, 1887, it narrowly escaped destruction by a memorable stroke of lightning which however expended its force beneath the stone paving at the base of the tower. The fastenings of the conductor, which had become worn and insecure, were then repaired, and in 1888 the outer stonework of the tower and steeple was repointed and reinstated. The opening of St. Bride's-avenue into Fleet-street was designed by J. B. Papworth, at a cost of about

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10,000*l.*, in place of Bride-passage, a narrow alley which was consumed by the fire in Fleet-street on November 14, 1824. See the woodcut in Hone's "Every Day Book," vol. i., cols. 87-8.

Innerpeffrey Castle, Perthshire.

WE hear that Colonel Hay is about to carry out a restoration of Innerpeffrey Castle, after designs prepared by Mr. George T. Ewing, of Muthill. The castle, situated on the north bank of the river Earn, and about four miles distant from Crieff, was built by the Honourable James Drummond, created Lord Maderty, a few years before his death in 1623. The castle, L-shaped on plan, with a square tower, which contains a newel staircase from the ground to the top story within the re-entering angle, presents an interesting example of a period when Scottish lords began to build their castles as much for peaceful occupation as for purposes of refuge and defence. Nevertheless, at Innerpeffrey some features of the older military architecture were adopted—for instance, the outer wall, the narrow loop-holed openings on the ground floor, and the shot-holes from the kitchen that cover the door. In the vaulted ground floor are the storerooms, larder, cellars, and kitchen, with, it would seem, a secret stair from one of the cellars to the hall. The principal floor contains the hall, measuring 32 ft. by 20 ft. and lighted on three sides, a private room with garde-robe, and a bedroom beyond. The rooms on the floor above are similarly disposed, but each of them is entered from the staircase, of which the steps are carried up to the attics above; the gables are crow-stepped. The neighbouring chapel, lately reinstated, formed during many generations the chief burial place of the house of Drummond.

The British Museum.

IN the annual statement presented to the House of Commons respecting the affairs of the British Museum it is notified that, in the Department of MSS., the purchase of the third portion of the Buckler collection of architectural drawings completes a transaction which secures for the department an unequalled series of sketches of buildings and architectural details from all parts of England and Wales, made by three generations of the Buckler family (especially by John Chessell Buckler) during the past century. As a record of the state of the ancient buildings of this country at the period named these drawings, which fill nearly 100 volumes, are of special value to the national collection. Mention is also made of the acquisition, in the Department of Prints and Drawings, of 113 drawings and three sketch-books of topography and costume, executed in pencil and water colours by George Scharf, sen., illustrating chiefly London houses, shops, and street musicians, the rebuilding of the British Museum, and military uniforms; also forty-five drawings, mainly views of old buildings in Westminster, by Sir George Scharf, by whom they were bequeathed to the Museum.

Donington Park, Leicestershire.

THIS ancient property of the Rawdon family, extending over 5,090 acres, will shortly be offered for sale by auction. The estate, which yields a rent-roll of about 8,500*l.* per annum, comprises a park of some 400 acres, bounded by the Trent, famous for its beautiful scenery, its herds of red and fallow deer, and its fine old oak trees. The south front of the mansion was constructed of stone quarried upon the estate. The east wing forms the chapel, measuring 58 ft. by 20 ft. On an eminence near the village of Castle Donington, in the extreme north-western corner of the county, are the remains of a castle that had been built, upon the site of a former one, by Henry de Lacy, Earl of Lincoln, who died in 1310, and was again rebuilt by George (Hastings), fourth Earl of Huntingdon, who in 1595 had bought it from Robert, Earl of Essex. In 1795 Francis, second Earl of Moira and first Marquis of Hastings, enlarged the residential portion of the house, which had been the home of his ancestress, Selina, Countess of Huntingdon, celebrated for her association with the Methodists, whose daughter, Lady Elizabeth Hastings, brought Donington, together with the Baronies of Hastings, Hungerford, &c., in marriage to John (Rawdon), first Earl of Moira. In some cottages on the estate are vestiges of the hospital founded by John de Lacy (who died, 1179, in Palestine), Constable of Chester, for a master and thirteen brethren and sisters, which he dedicated to St. John the Evangelist.

Electric Wiring Rules.

THE paper on wiring rules by Mr. F. Broadbent, which has just been published in the *Journal of the Institution of Electrical Engineers*, severely criticises many of the codes of rules issued by supply companies and fire offices. It would undoubtedly save a great deal of needless trouble if the code of rules issued by the Institution of Electrical Engineers was universally accepted. In our opinion, this code is far from perfect, but it has the merit of being brief and treating only of important points. Many of the fire office rules magnify unimportant details, and their recommendations sometimes even increase the fire risk. For example, some of the rules say that motor-starting resistances must be fixed on stone or brick walls, and one even goes so far as to insist that they must be placed "outside of the building." Mr. Broadbent points out the absurdity of this rule by instancing a printing establishment employing a hundred motors. If the resistances were fixed outside we should require at least 2,000 connecting wires, and the fire risk would be most decidedly increased. Again, many corporations make very stringent regulations about the maximum permissible starting current of a motor, but none apparently make any objection to the current being switched off at any instant, although the blink in neighbouring glow lamps caused by a sudden rise of pressure must considerably shorten the life of the lamps. Companies fine consumers by means of their maximum demand indicators for taking too much current for a short period, and they prove to every one's satisfaction that this is an equitable arrangement. It seems to us that companies ought to be fined whenever their pressure of supply rises too high, as this spoils the lamps in the circuit. It is unfair that the fines should all be at the expense of the consumer.

Sanitary State of Alcester and District.

DR. S. MONCKTON COPEMAN, in a recent Report to the Local Government Board on the general sanitary circumstances and administration of the Alcester, Warwickshire, Rural District, mentions that water-closets, except in Alcester, are almost unknown throughout the district, the methods of excrement disposal comprising the use of pails, to which, in some instances, dry earth or ashes are supposed to be added, and ash-pit privies. At Alcester, Studley, and Bidford, the removal of ashes and of excremental and other refuse is carried out by scavengers under contract with the District Council. The following are Dr. Copeman's conclusions in this connexion:—

"It would be well that the Rural District Council should as soon as possible make arrangements for the periodical removal of excremental and other refuse in all the larger villages. Probably also increased efficiency in the manner in which the work is carried out would be attained if the Council took the matter entirely into their own hands, instead of farming it out to contractors. But in any case, where scavenging is carried out, they should insist on collection at sufficiently frequent intervals, and so prevent any accumulation of refuse in the neighbourhood of houses."

The Report supplies evidence as to overcrowding in several of the villages, and in regard to Alcester itself we may quote the following remarks, which, we fear, are applicable to many other towns and villages in the country:—

"At Alcester, the building of new houses is almost at a standstill. In one block of buildings in Gas House-lane, most appropriately known as the Rookery, I found that overcrowding existed to a very serious extent. In support of this statement it may be mentioned that on making inquiries at several adjoining cottages on the Gas House-lane side of the block, I learnt from the inhabitants that the bedrooms, of which each cottage possesses two, having a total air capacity of only about 1,000 cubic feet, had to afford at night sleeping accommodation for the number of persons noted below:—1. Husband and wife, with nine children varying in age from sixteen years to three months. 2. Husband and wife, with five children varying in age from twelve years to one year. 3. Husband and wife with six children varying in age from twelve years to two years."

The Duke of Westminster Memorial, Westminster Abbey.

WORKMEN are now engaged in removing the stained glass from the great rose window in the south transept of Westminster Abbey. This glass, known as the marigold glass, dates from 1847, and has always in our opinion very much detracted from the view from the north transept, overpowering with the brilliancy of its colours the setting which it was intended to adorn. It is to be replaced by the new Duke of Westminster memorial, a scheme that includes all the glass in the south wall of the south transept. The design for the new glass is in the hands of Mr. G. F. Bodley, A.R.A., and we understand that Messrs. Burlison & Grylls, who are doing the work, will have it completed before the Coronation. The centre of the rose is to be filled by a figure of Christ, while the radiating lights will be occupied by angels and the Virtues, Old Testament and pre-Christian characters. We cannot speak of modern stained glass with unguarded enthusiasm, but the position that this memorial is to occupy ought to be a sufficient guarantee that the best that is possible will be done.

The New Government Offices.

WE are very glad to see that the *Times*, in a leading article in its issue of Monday last, has spoken out strongly on the subject of the Office of Works carrying out Mr. Brydon's building without an architect. The article

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comes rather late in the day, but now that it has appeared, it is everything that we could wish. The whole case is put very strongly, and on quite the right grounds; and we can hardly doubt that such an article in the *Times* will have its effect on public opinion.

MACHINERY AT THE GLASGOW EXHIBITION.

WHILST there are several buildings of comparatively small size in the Glasgow Exhibition devoted to mechanical appliances of different kinds, the bulk of the exhibits coming within this class are collected together in the Machinery Hall. This building, therefore, forms a natural starting point for visitors who are interested in engineering work. The Hall is 500 ft. long by about 300 ft. wide, comprising five bays, and with its annexes covering an area of about five acres. The roof of the central bay has a span of 108 ft. and a height of 54 ft.; it is supported on steel latticed columns spaced 8 ft. apart and disposed in pairs on either side of each principal. Arched girders extend from one end of the building to the other, having a span of 41 ft. 6 in., corresponding with the longitudinal spacing of the supporting columns. Cantilevers are built around each pair of columns for the support of the 16 ft. wide gallery running round the Hall at a height of 12 ft. above the floor level, and of double lines of shafting for actuating machinery. As the site of the building exhibited a rise in one direction, excavation was necessary in order to provide a level floor space, and retaining walls were required along two sides to prevent injury to adjoining roadways. The foundations of these walls were sunk through mud and silt to a solid bottom in order to avoid damage to adjacent property and to ensure the stability of the structure. At one end of the main building is the dynamo-house, about 100 ft. square, and communicating with this is the boiler-house, 204 ft. long by 70 ft. wide. The floor of the latter is sunk to a convenient depth so that visitors can command a good view of the steam generators and auxiliary appliances from a gallery on a level with the floor of the main building. For the purpose of driving the machinery intended to be operated in the Exhibition it was estimated that about 5,000 horse-power would be required, and the supply of motive force is furnished by the aid of several types of steam boiler.

Messrs. Penman & Co., of Glasgow, have four Lancashire boilers in operation, each 30 ft. long by 8 ft. diameter, working at a pressure of 120 lbs. per square inch. These boilers furnish steam to such exhibitors as require a moderate pressure, and the service-pipes (equalling a total length of over 1,000 ft.) are of wrought iron or mild steel with cast-iron connexions, the pipes being laid in timber-lined channels below the flooring. The whole of the controlling valves, steam separators, steam traps, and expansion joints were lent by the Glenfield Company, of Kilmarnock. A main flue situated behind the four boilers serves to collect the products of combustion, which pass through a Green's Economiser of 192 tubes, thus heating to a temperature of from 550 deg. to 700 deg. Fahr., the water employed for feeding the boilers. A small independent engine is situated on the top of the Economiser for driving the mechanical scrapers designed to remove soot as fast as it is deposited on the surface of the tubes. By the employment of such an apparatus it is well known that a very considerable saving of fuel may be effected without impairing chimney draught, but unfortunately many public bodies are still to be found who permit financial considerations to exclude the advantage in question from the buildings under their control. Beyond the Economiser is an induced-draught plant, installed by the Sturtevant Engineering Company, comprising a direct-driven fan built in brickwork at one side of the main flue, and connected therewith by suitable suction and discharge ducts. The fan is driven at a speed of about 450 revolutions per minute, its effect being to materially increase the volume of air passing through the boiler furnaces. By the aid of this arrangement cheap forms of fuel may be employed, and the cost of chimney shafts may be materially reduced. Next to the Lancashire boilers mentioned above is one of Messrs. Davey, Paxman, & Co.'s Economic boilers, 14 ft. 6 in. long by 8 ft. 9 in. diameter working at a pressure of 160 lbs. per square inch. This type of boiler has return fire-tubes above the furnace, and after passing through these the hot gases are led along each side and under the bottom of the boiler before entering the back flue. At one side of the boiler is a Paxman superheater having dampers which are operated from the front, and a Green's Economiser is installed in connexion with the main flue. Water-tube boilers of three types are also used for the generation of steam at 160 lbs. per square inch. There are two Stirling water-tube boilers, made by the Stirling Boiler Company, of Edinburgh. In these the tubes are nearly vertical, and arranged so that the hot gases are compelled to pass along different banks of tubes, and finally to emerge at the point where the feed-water enters. In this way the temperature of the gases is reduced to a minimum before entering the flue. One of the Stirling boilers is fired by coal, the supply being controlled by a Vicars' mechanical stoker, and the other is fired by gas furnished by a Duff's patent Gas-Producer, made by Messrs W. F. Mason & Co., of Manchester. Adjoining the last-mentioned boilers are two Babcock & Wilcox water-tube boilers, capable of providing steam for about 2,000 indicated horse-power. Each of the boilers is fitted with one of the same firm's superheaters, imparting from 100 deg. to 120 deg. Fahr. superheat to the steam, and also with the Babcock & Wilcox chain grate stoker actuated by eccentrics on a shaft attached to the front of the steam-drums. A Babcock & Wilcox marine type steam-boiler is also shown, this being equal to about 1,000 indicated horse-power.

It should here be remarked that the necessity for erecting a large and expensive brick chimney has been avoided by the expedient of establishing separate wrought-iron shafts for the different groups of boilers. The Lancashire boilers have a wrought-iron chimney 80 ft. high by 6 ft. internal diameter, resting upon a cast-iron bedplate built in segments upon a brick foundation; the Stirling and the Babcock boilers are each in communication with a wrought-iron shaft 80 ft. high by 4 ft. internal diameter; and the Babcock marine type boiler has a 3 ft. diameter flue connected up to the nearest chimney. All the chimneys and their bases are suitably protected by firebrick linings. Coal is brought directly into the boiler-house by means of a siding in connexion with the system of the Caledonian Railway Company, each truck passing over an automatic weighbridge, built by Messrs. W. & T. Avery, which records the gross weight inwards and the weight of the empty truck outwards. The handling of fuel is assisted by a conveyor laid down by the New Conveyor Company, of Smethwick. In the boiler-house, and in an adjoining apartment—known as the feed-heater and pumproom—there is a very fair selection of auxiliary appliances having for their object the attainment of economy by utilising waste heat from boiler fires, and exhaust steam from the engines. Of these aids the economisers have already been mentioned, and the others are of the class of apparatus described as "feed water heaters." The well-known firm Messrs. Joseph Wright & Co., of Tipton, exhibit two of their Excelsior non-pressure heaters, which, in addition to heating the water, filter it and separate particles of oil contained therein; there are also two of the Berryman pressure type heaters. A set of Worthington vertical direct-acting pumps is devoted to the service of the heaters mentioned, the pumps having a combined duty of 35,000 lbs. of water per hour against a pressure of 160 lbs. per square inch. Two varieties of Royle's feed water heaters are to be seen in the feed-heater and pump-room; class A being intended for ordinary use, and class B for dealing with water containing a large proportion of dissolved mineral matter. Heaters of the first class are served by compound vertical duplex pumps by Messrs. Carruthers & Co., capable of delivering 35,000 lbs. of water against a pressure of 160 lbs. per square inch; the other heaters are served by a set of Weir's vertical direct-acting feed pumps. The whole of the pipe connexions are duplicated, thus reducing very materially the risk of any interruption of the water supply to the steam-boilers. This portion of the boiler department is well worthy of careful examination.

Motive power for the use of exhibitors is furnished (1) by electric current, (2) by steam engines, and (3) by compressed air. Taking these in order, we come first to the electricity generating station to be found at the south-west end of the Machinery Hall. Two of Messrs. Willans & Robinson's vertical triple-expansion central-valve engines naturally attract the attention of the visitor, the examples on view being the pair of engines designed for the new electric light station at St. Andrew's Cross, Glasgow. One motor is connected with a Crompton dynamo, and the other with a generator of the Schuckert type; in each case the armature of the dynamo takes the place of a fly-wheel, this arrangement being rendered possible by the uniformity of motion afforded by the three cranks. The power developed by each engine under normal conditions is 1,200 indicated horse-power, or 1,500 indicated horse-power in cases of emergency. An excellent coupled compound electric-traction engine is exhibited by Messrs. Davey, Paxman, & Co., of Colchester, this machine being attached to an E.C.C. dynamo by the Electric Construction Company, Limited, of Wolverhampton. Another coupled compound engine of the horizontal type is shown by Messrs. Robey & Co., of Lincoln, this engine developing 500 indicated horse-power, and acting in conjunction with a Mavor & Coulson dynamo. Two high-speed vertical compound engines and dynamos combined are also exhibited by the same firm, one of the dynamos being by Messrs. Scott & Mountain, of Newcastle. A well-designed high-speed vertical engine of the enclosed type is contributed by Messrs. Ruston, Proctor, & Co., of Lincoln, and the well-known Belliss engine is to be seen working in association with a 200 kilowatt dynamo by Messrs. Bruce Peebles & Co., Edinburgh. Other electric steam plants are included in this part of the Machinery Hall: a 125 b.h.p. vertical engine by Messrs. Sisson & Co., attached to a Clarke-Chapman dynamo; an Alley & MacLellan three-crank compound vertical engine of 300 horse-power coupled to a 6-pole dynamo; and a Browett-Lindley vertical engine of 200 horse-power, working conjointly with a generator shown by the Edison-Swan Electric Company. Altogether there are twelve sets of generators giving a total output of about 4,175 electrical horse-power, and although none of the plants can be said to be of more than the most moderate dimensions, yet they are sufficiently indicative of the fact that British engineers are alive to the importance of providing for the rapidly increasing application of electricity in the present day.

Steam is furnished to the engines by a ring main with suitable branches; stop valves are placed so that any section of the piping can be cut out in the event of mishap; and there is ample provision of separators and steam traps for removing water of condensation from the service pipes. All the separators and valves in this department have been furnished by the Glenfield Company, and the steam traps by Messrs. Royles, of Manchester. The exhaust pipes from the engines are of various diameters ranging from 5 in. to 36 in., they are arranged to furnish steam to the feed water heaters at a temperature of about 250 deg. Fahr., pressure being equalised by means of a 30-in. steam sluice valve, and they have three outlets to the atmosphere. Before dismissing the electrical plant from consideration it may be remarked that five of the dynamos afford current at from 500 to 530 volts at the terminals, and seven at from 250 to 265 volts, the range in the voltage being intended to cover losses in transmission to the different points of distribution in the Exhibition area. The main switchboard is 31 ft. 9 in. long by 7 ft. high, and contains 15 panels furnished with the usual apparatus and instruments. There are also seven distributing stations, of which two are in the Machinery Hall, one in the Grand Avenue, and three in the Industrial Hall, these stations being devoted to the control of all the arc and incandescent lighting. The arc lamp is employed in the main buildings for general lighting, ten lamps being run in series on a 500-volt system, and in the other buildings the same class of lamp is used, five in series on a 250-volt system. In addition to the above mentioned, there is a large number of incandescent lamps of various powers, including a complete system of pilot lighting, arranged so that all the principal passages can be lighted direct from the Corporation supply. All the main cables, branch main cables, and sub-main cables were supplied by the British Insulated Wire Company, of Prescot, and the arc circuit cables for the main buildings by Messrs. Frankenburg, of Salford. More than 120

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motors, ranging in power from ¼ h.p. to 150 h.p., for driving machinery are to be found in the Machinery and the Industrial Halls.

One of the lines of shafting in the Machinery Hall is driven by a steam engine of 100 h.p., by Mr. John Cochrane, of Barrhead, and the other by a 100 h.p. electro motor, by Messrs. Bruce Peebles & Co., of Edinburgh. Both lines of shafting, together with all the necessary auxiliaries, were furnished by the firm of Messrs. Watson, Laidlaw, & Co., of Glasgow.

Compressed air is chiefly used for the operation of machine tools, the only exceptions we noticed being for the purpose of demonstrating the working of a locomotive engine by Messrs. Neilson, Reid, & Co., Glasgow, and of one or two full-size working models of gas meters. A very complete installation of air-compressing plant is exhibited by Messrs. Macdonald & Son, Glasgow and Newcastle, agents for the Ingersol-Sergeant Company. The same firm is responsible for a varied display both inside and outside the main buildings of the Ingersol-Sergeant and the New Taite Howard Pneumatic Tool appliances. Exhibitors requiring compressed air are supplied from the Ingersol-Sergeant plant, which includes a compound steam-driven compressor having a capacity of about 1,200 cubic feet of free air per minute, compressed to 100 lb. pressure; a steam-driven piston inlet type compressor with a capacity of 400 cubic feet per minute; and a belt-driven compressor with a capacity of 300 cubic feet per minute. Another compressor is situated in a pavilion in the Exhibition grounds, this machine being drivea by electricity, and having a capacity of 210 cubic feet per minute.

Up to the present point it has been possible to preserve to some extent a consecutive treatment of the machinery noticed, but a similar course is very difficult of application to general exhibits, partly because they are more or less distributed over the Machinery Hall and in outside pavilions, and partly for the reason that most engineering firms are manufacturers and exhibitors of different classes of apparatus. As far as practicable, however, the attempt will be made to classify our comments. Steam and electric traction come within a department of engineering which is only incidentally of interest to our professional readers, but we cannot entirely pass by without remark the admirable examples of locomotive engines occupying a prominent position in the Machinery Hall. One of the new types of passenger engines now being introduced upon the South-Eastern and Chatham Railways, is shown by Messrs. Sharp, Stewart, & Co., of Glasgow, and near this is one of the Midland standard type of passenger engine, exhibited, as before mentioned, by Messrs. Neilson, Reid, & Co. A noteworthy example of locomotive construction is an express passenger engine of the London and South-Western Railway type, shown by Messrs. Dubs & Co., of the Glasgow Locomotive Works. Electric traction, which is destined to afford much scope for the exercise of architectural skill in the vicinity of large cities, besides contributing to the well-being of the workers and dwellers therein, is well exemplified by the combined exhibit of Messrs. Dick, Kerr, & Co., the English Electric Manufacturing Company, and the Electric Railway and Tramway Carriage Works. At this stand are shown two standard types of completely equipped electric cars, a 500-kilowatt traction generator, a complete traction switchboard, and a series of traction motors and controllers. The four-wheel double-decked car is a very handsome vehicle, and the bogie combination is a single-decked vehicle of a kind not previously introduced into Great Britain, but presenting advantages which ought to commend themselves to tramway managers. The work of the three companies mentioned is specially interesting for the reason that they are making a determined effort to meet the demand for traction machinery in Great Britain with appliances of British manufacture throughout, and to compete more effectively with American and Continental engineers for colonial and foreign trade. Electric traction is also exemplified by the British Schuckert Electric Company, whose pavilion and adjoining space in the Exhibition grounds will repay a visit. We have already adverted to the generators made by this firm, whose manufactures extend to varied branches of electrical work, including dynamos, motors, transformers, switching and controlling apparatus, meters, ammeters, voltmeters, arc lamps, searchlight projectors, and electric supply stations. On the dome of the Grand Hall is a search-light projector erected by the Schuckert Company, having a parabolic mirror rather more than 78 in. in diameter. This is the largest light of the kind hitherto built; the equipment is regulated by two electric motors, and the working current is taken from the Corporation supply.

We have before referred to the principal engines used for the operation of generators, but some of the others are equally worthy of notice. Four small engines are shown by Messrs. Alexander Shanks & Co., of Arbroath. One of these is running daily, and drives a two-pole continuous current dynamo. The engine is of the vertical compound open type, giving 22 b.h.p. with steam at 100 lbs. per square inch. The second engine is also vertical, of the enclosed compound type, with forced lubrication, giving 75 b.h.p. with steam at 160 lbs. per square inch. The other two engines represent the vertical and horizontal single cylinder types made by this firm, who deserve every credit for the excellent design and finish of the machines shown. Besides the three-crank engine previously mentioned, Messrs. Alley & MacLellan exhibit two others, the smaller one of 50 b.h.p., with two pairs of cylinders disposed in the vertical tandem style. A varied collection of machinery is provided by Messrs. Clarke, Chapman, & Co., of Gateshead, amongst them being a small electric lighting set and a number of mechanical and electrical appliances, chiefly suitable for steamships. An extremely ingenious tool we noticed was a portable electric drill attached to a clamp, and driven from the motor by a flexible shaft. Messrs. Duncan Stewart & Co., of Glasgow, show an internal combustion engine of entirely novel design, in which pulverised coal is employed as fuel. Unfortunately, this interesting motor was not exhibited in working order, and the visitors had therefore no opportunity of judging for themselves as to the merits of the most recent attempt to develop the power latent in coal without the wasteful intervention of a separate furnace, water, and steam pipes. An air compressor on the same stand is driven by a vertical inverted compound engine with Meyer cut-off valves and using steam at any pressure up to 150 lbs. Headech's "Heavy Oil" motor is another engine shown by Messrs. D. Stewart & Co., specially designed for the propulsion of waggons and other vehicles used for the transportation of heavy merchandise. Ordinary paraffin oil is used as the source of power, and the engine will develop 20 b.h.p. on a consumption of one pint of paraffin per horse power per hour. An arrangement of electrically driven Weston type centrifugal machines, and an electrically driven Stewart's carbonic anhydride refrigerator are shown at the same stand.

One of the most important exhibits in the Machinery Hall is that of Messrs. Mather & Platt, of Salford. This is divided into four distinct classes, the first comprising bleaching apparatus of different kinds; the second relating to filters and the purification of sewage, to which we directed attention in a previous article, and in this class there is also a working model explanatory of the Archbutt-Deeley water-softening apparatus, which has been very successfully used for the treatment of public water supplies, and of water to be applied in various industrial operations. The third section comprises engines and electrical apparatus. Two compound open-type vertical engines may be seen, each priving a multipolar generator, the larger plant having a capacity of 135 kilowatts, and the smaller of 70 kilowatts; there is also a small high-speed engine and dynamo of unique design for an output of 200 volts, 115 amperes, equalling 23 kilowatts as normal working load. Messrs. Mather & Platt's patent high-lift centrifugal pumps are shown in two sizes; the first, capable of discharging 210 gallons per minute against a head of 70 ft., is driven by an electric motor having an output of 13 b.h.p. when running at 1,400 revolutions per minute, and the second, capable of discharging 1,250 gallons per minute against a head of 95 ft., is direct-coupled to a multipolar motor having an output of 50 b.h.p. when running at 700 revolutions per minute. Both these sets are admirable examples of design and workmanship. Another pump is of the three-throw variable stroke type, capable of delivering 2,500 gallons per hour against a pressure of 180 lbs., and the special feature of this machine is that the motor runs at a constant speed, the delivery of water being regulated entirely by varying the stroke of the plungers. By this arrangement the waste of power occurring when resistance is inserted in the main circuit for varying the speed of the motor is altogether avoided. A large generator is exhibited as an example of eight now in course of construction for the Salford Corporation tramways and lighting. This generator is of striking and massive design, weighing fully 50 tons, which is double that of any similar appliance in the Exhibition. Several electric motors from 4 b.h.p. to 46 b.h.p. are shown on the same stand, an engine-driven turbine pump of very compact design, a self-contained portable electric drill, in which the spindle is direct gear driven from the motor shaft, and an "Aspinall's" electric conveyor, which is practically an electric locomotive and crane combined. The fourth section of Messrs. Mather & Platt's exhibit is chiefly devoted to fire appliances. Of these the Grinnell automatic sprinkler is well known to our readers, and so also are some of the other appliances in the section. Messrs. Mather & Platt's armoured self-closing fire-doors are certainly constructed on common-sense principles, and deserve the success to which they have attained. Messrs. D. Bruce Peebles & Co., of Edinburgh, are a comparatively new firm, whose works are equipped, we are happy to say, with equally modern machine tools and labour-saving appliances for the manufacture of electrical apparatus. In addition to the motor and dynamo mentioned in the early part of these notes, a considerable amount of their other electrical machinery is on view. All the exhibits of this firm combine symmetrical design with good workmanship, and a visit to their stand will be by no means a waste of time. The General Electric Company and Messrs. Verity have each a good assortment of standard fittings, lamps, switches, switchboards, and kindred appliances; and the Sturtevant Engineering Company show samples of the Cutler-Hammer automatic motor starting and controlling rheostat, an appliance which is much in favour with electrical engineers.

Pumping machinery is a prominent feature of the Glasgow Exhibition, and one of the most important exhibits is that of Messrs. Tangyes. An excellent example of pumping plant for dock work is the principal object on the stand of this firm. It has been built for use at the Hebburn Graving Dock, and comprises two centrifugal pumps and two direct coupled engines, the total capacity being a delivery of three-quarters of a million cubic feet of water per hour against a head of 35 ft. Each pump is 6 ft. diameter, the suction and delivery pipes being 3 ft. 9 in. internal diameter. A smaller set of pumps intended for drainage work is worth inspection, as also is a very well made working model of the pumping engines now being built for the Hastings Corporation Waterworks. In that installation there will be two sets of pumps, including two well pumps and triple ram pumps in the engine-room, driven by two triple expansion vertical engines. The well pumps are to be capable of lifting 90,000 gallons of water per hour from a depth of about 250 ft., and of discharging this quantity through a mechanical filter working at 10 lbs. per square inch. The engine-room pumps will deliver 80,000 gallons of water per hour through rather more than 5½ miles of 16-in. main with a total rise of 515 ft. One of the Tangye gas engines is shown on the stand, but this does not call for any special remark.

An exhibit that constitutes quite a distinctive feature in the Machinery Hall is that of the well-known firm of Messrs. G. & J. Weir, of Glasgow. Something more has been attempted in this case than the mere collection of a number of utilitarian appliances. Those who are acquainted with the productions to which we refer are aware of their mechanical excellence, but every visitor to the Exhibition now has ample opportunity of appreciating the artistic taste evidenced in the arrangement of the display made by this firm. The main exhibit is situated at the level of the gallery in the Hall, and on the floor level is a concrete reservoir 40 ft. long. From this water is drawn by two Weir pumps and discharged into a lead-lined tank 8 ft. above the reservoir water level. This tank is arranged so that the water continuously flows over the front edge into the reservoir beneath, thus forming a cascade 40 ft. wide, which at night is illuminated by coloured electric lights. Many of the

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pumps and other appliances exhibited, both at work and at rest, are intended for marine use, but several of them are of general interest. Amongst the latter we may cite a standard tandem compound feed pump for electric light station duty, various sizes of standard differential type pumps, and of standard boiler feed pumps. The Pulsometer Engineering Company, of London, present for examination a very excellent display of their varied manufactures. Naturally the "Pulsometer" steam pump itself occupies a prominent position, and this ingenious appliance is represented by a series ranging in capacity from the smallest, with a capacity of 900 gallons per hour, to one with a duty of 52,000 gallons in the same time. Readily set to work in almost any situation, easily shifted, and almost universal in its applications, the "Pulsometer" has fully justified its claim to recognition by engineers, architects, builders, contractors, and all who have occasion to lift water from one place to another. The horizontal "Deane" and vertical "Deane" sinking pumps are also handy and serviceable machines. A "Torrent" filter, of the so-called "mechanical" type, finds a place on the same stand, and is undoubtedly a valuable adjunct to industrial establishments of different kinds, as by its employment river or other impure water may be rendered clear and fit for use in manufacturing processes or for feeding steam boilers. Apparatus for the purification of water for use in land and marine boilers is to be seen in various stands. For instance, Messrs. Railton & Campbell exhibit their "corrugated and ringed" feed-water filters, which have been largely adopted in electric-light stations, and interesting exhibits of a similar character are made by Mr. James Davie, of Glasgow, and the Harris Patent Feed Water Filters, of Greenock, the latter firm also showing the Harris-Anderson automatic water softener. Morison's feed water heater, cleaner, and air-extractor, made by Messrs. Richardsons, Westgarth, & Co., of Hartlepool, is another appliance of interest. Zschoecke's water-cooling tower, for which Messrs. Doherty & Donat, of Manchester, are the sole licensees, includes an ingenious arrangement of patent hurdles with "dripping noses," and has been adopted in thirty-five electric light stations in different parts of the world. Messrs. John Turnbull, Jun., & Sons, of Glasgow, have a stand on which their "Hercules" turbine is shown, this machine being recognised as one of the most satisfactory water motors for electrical and other industrial purposes. Messrs. Lancaster & Tonge, of Manchester, have a good show of their specialities, including the Lancaster trap, which is probably the most reliable and satisfactory steam trap of its class. Rawhide pinions are shown by Messrs. George Angus & Co., of Newcastle, together with specimens of leather belting. Raw-hide gearing is perfectly noiseless in action, and is therefore very suitable for employment in buildings where the working of lift or other machinery ordinarily constitutes an annoyance to the inmates. Architects as well as engineers may frequently make use of flexible steam tubing such as that exhibited by the United Flexible Metallic Tubing Company, of London. Apart from the Exhibition buildings themselves there are not many stands devoted to structural work, but the small pavilion erected in the Machinery Hall by Pease's Tubular Construction Company, of Darlington, should on no account be overlooked. The form of construction involved enables the ironwork to be put together without skilled labour, without perforations in the metal sheets. Cambered purlins bring the sheets into firm contact with tubular rafters, and the lap between the sheets is absolutely close. Pease's patent steel floor troughs are also recommended to attention. This form of flooring is very readily laid, and the hollows can be filled with concrete or ashes, or they may be automatically filled with water in the event of fire breaking out. As might be expected, Messrs. Walter Macfarlane & Co., of Glasgow, are very much in evidence, and their trophy in the Machinery Hall is worth a visit.

Messrs. P. & W. Maclellan, of Glasgow, show, in the Machinery Avenue, a full-size model of Turner's tubular fire-resisting floor; and some samples of floor troughing, as used in the Concert Hall, are exhibited by Messrs. Alexander Findlay & Co., of Motherwell. The same material was adopted, it may be remarked in passing, in the roof of the Great Central Railway Station, London. There are several fine displays of constructional iron and steel in the Machinery Hall, amongst them being those of Messrs. A. J. Stewart & Menzies, Glasgow; David Colville & Sons, Motherwell; the Steel Company of Scotland; the Glengarnock Iron and Steel Company; the British Griffin Chilled Iron and Steel Company, of Barrow; and the British Hydraulic Foundry Company. At the stand of the last-named are shown several rings of different diameters illustrative of the linings for tubular railway and other tunnels. Stone-breaking plant is represented by Messrs. Robert Broadbent & Son, of Stalybridge, whose machines are furnished with manganese steel jaws and a new draw-back motion. A fair selection of brick-making machinery is placed on view by Mr. Thomas C. Fawcett, of Leeds, but attracts comparatively little attention owing to the fact that it is not shown in operation.

We now come to appliances for elevating and conveying, foremost among which are those of the New Conveyor Company, of Birmingham, intended for industrial undertakings. The Crompton atmospheric ash-hoist may be seen at work in the boiler department of the Exhibition where it is used for lifting and discharging all the ashes from the furnaces. This hoist is noiseless in action, and although hitherto chiefly adopted in marine work, it might be advantageously applied to land boilers. Messrs. Pickerings, of Stockton-on-Tees, show examples of their well-known elevators for buildings; and Messrs. A. & P. Steven have a very complete installation of lifts at work, including hydraulic and electric elevators for passengers and goods. Messrs. Henry Pooley & Son exhibit automatic weighbridges of different kinds, as well as an assortment of scales of various descriptions. The Bundy time recorder and the Rochester time recorder, shown by the International Time Recording Company, of London, should be specially interesting to builders and contractors. Messrs. Watson, Laidlaw, & Co., of Glasgow, are makers of sugar machinery of several kinds, but they are best known in connexion with the "Weston" centrifugals and hydro-extractors, of which different types are to be seen on their stand. The water-driven type of hydro-extractor was specially designed for public institutions, and has been extensively adopted by the Glasgow Corporation in baths and other municipal buildings. Messrs. Thomas Bradford & Co., of Manchester, and Messrs. D. & J. Tullis, of Glasgow, each exhibit steam laundry machinery in considerable variety. Amongst refrigerating and ice-making plant we noticed two interesting installations in operation, by Messrs. J. and E. Hall, of Dartford, and Messrs. L. Sterne & Co., of Glasgow, representing the rival "carbonic" and "ammonia" processes.

Heating and ventilating apparatus is for the greater part contained in a separate pavilion at the end of Machinery Avenue, but there are several kindred exhibits in the Machinery Hall. Messrs. James Stott & Co., of Oldham, have examples of air propellers, ventilating appliances, and gas governors; the Sun Fan Co., of Bradford, whose specialty is ventilating and drying, show an "unbreakable" fan driven by belt, and one of the same kind direct driven by an enclosed electric motor; the James Keith and Blackman Co., of London, exhibit a Keith's python hot water boiler of exceptionally large dimensions, a 72-in. Blackman electric fan, and a large belt-driven fan; the Sturtevant Engineering Company and James Gibb & Son are also exhibitors of ventilating fans and kindred apparatus. Thwaites Brothers, of Bradford, show several types of the well-known Root's blower, of which they were the original licencees in this country. Machines of the kind are largely used in connexion with forges and foundry cupolas, and are illustrated at the Exhibition by a blower driven direct by a compound tandem engine, a belt-driven and a motor-driven blower. Other examples of the firm's work are two centrifugal pumping-engines, both of them in operation. Hot-water boilers, radiators, &c., are exhibited by several firms. Amongst those are the American Radiator Company, of London, and Messrs. Richard Crittal & Co., of London. Wood-working machinery has not received much attention at the Exhibition, although there are two fairly complete collections, one by Messrs. John McDowell & Sons, of Johnstone, and the other by Messrs. Kirchner & Co., of London. Cook's patent guards for wood-working machinery, shown by Messrs. William Cook & Sons, of Glasgow and Sheffield, are very practical and efficient appliances. The types shown are intended for circular saws, moulding machines, and planing machines. Engineer's machine tools are present in great variety—in fact, all the leading British makers, as well as most of the importers of American tools, are in evidence either in the Machinery Hall or in outside pavilions. Probably the most interesting of such exhibits are those relating to the use of compressed air for boring, drilling, chiseling, and riveting. Most of the tools adapted for these purposes are to be seen in actual operation, demonstrating very effectively the superiority of modern methods in aid of structural and other work. Several small buildings in the Machinery Avenue are devoted to acetylene apparatus, and artificial lighting is further exemplified by the high-pressure system of incandescent gas lighting. It is claimed by the exhibitors, the Water Motor and Automatic Liquid Elevator Company, of London, that by this method ten times the amount of light can be obtained from gas that would be produced in the ordinary way. Two of the company's compressors, capable of supplying 12,000 cubic feet of gas per hour are employed to furnish the pressure necessary for the high-pressure installation in the grounds of the Glasgow Exhibition. The results obtained are certainly remarkable, and there ought to be a considerable future for the system.

In closing our remarks upon machinery at the Glasgow Exhibition, we may say that although many well-known firms are noticeably absent, there is nevertheless a very fair representation of the engineering industries of the United Kingdom. Scotland is naturally well to the front so far as the number of exhibitors is concerned, whilst in point of excellence both England and Scotland show conclusively that the reputation earned by our country in the past is still being worthily maintained.

AN OLD BUILDERS' GUIDE.

MANY years before Gwilt gladdened the heart and lightened the labour of architectural students, there were efforts made by other lexicographers to bring the technical terms used by architects and builders into a consecutive list; that is to say, long before the publication of Gwilt's "Encyclopædia of Architecture," with its good glossary, a certain Richard Neve was in the field with a smaller volume wherein he set down, alphabetically, all the technical words he could include between an abacus and a zopissa, extending his explanations of some of them in an encyclopædical fashion. This work was eventually enlarged and corrected, and a third edition of it appeared in 1736. As it has become a custom among some of our contemporaries to take down old books from the shelves in their libraries and descant upon their contents, a glance at the information collected in this one may not come amiss or be considered out of the way. A plan and elevation of the Earl of Burlington's house at Chiswick were chosen for a frontispiece; and the title-page sets forth that it was "The City and Country Purchaser's and Builder's Dictionary, or the Complete Builder's Guide," and contained "an explanation of all the terms of art used by workmen, as also what is necessary to be known in the art of building, as well by gentlemen as artificers of every denomination." Further on it claims to be "very useful to gentlemen, to workmasters and workmen, in the making of bargains, contracts, or computations relating to any part of a building;" and that it was originally written and compiled by Richard Neve, Philomath. It was printed for six booksellers, who doubtless shared the risk of the venture. The first edition must have met with a good sale, for before the third was undertaken two rival volumes made their appearance that had incorporated a great part of Mr. Neve's observations and experiences, to the great indignation of the six booksellers mentioned, whose names were Sprint, Brown, Osborn, Birt, Linton, and Wilde, some of which are familiar to us through other associations.

Mr. Richard Neve refers to a previous author, Mr. Sebastian Le Clerc, as an authority for the range of subjects necessary for any one to study to "procure him a genius, an accuracy and a good taste," as well as to the authors of older times, such as Pliny, Vitruvius, and Palladio. He mentions several persons then living by name, who gave him their experi-

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ence as to prices and methods, either in their works or in correspondence or conversation, and thus we learn something of the identity of individuals who have now long passed away, and into whose labours we may be said to have entered. For instance, he mentions the ingenious surveyor, Mr. R. Hooke, who caused water to be thrown over each course of brickwork in the building of the College of Physicians in Warwick-lane. A Mr. Wing gave him the current prices of materials in Rutlandshire, which differed very much from those furnished him by Mr. Leybourne, of London. A Mr. Switzer was his authority for Wiltshire facts. He mentions a method of surveying practised by Mr. Ventres Mandays, and experiments by Dr. Halley (levelling by means of the barometer) and Dr. Derham. Mr. Miller, of Chelsea, the author of a gardeners' dictionary, is often quoted for his opinion concerning trees and timber. If there should be any descendants of these worthies at the present day, they may be glad to hear of the consideration in which they were held. It was only thirteen years before that Sir Christopher Wren was buried in St. Paul's Cathedral, with the proud word *circumspice* on his tombstone in the crypt. It was just about the time that Johnson and Garrick resolved to try their fortunes in London, and twenty years before the publication of Johnson's own dictionary. Pope and Swift were still living, and Horace Walpole had not then begun his Parliamentary career, nor inaugurated the revival of Gothic architecture at Strawberry Hill. An Act of Parliament had been passed not very long before that required all water from the tops of houses, balconies, and pent-houses to be conveyed by "party pipes" into channels under a penalty of 10*l.* for non-compliance.

As we turn over the pages, to which time has given an incomparable tint, we come to many quaint expressions. For example, in one place our author tells us that light is God's eldest daughter, and in another that it is better to be too little for a day (in planning a house) than too big for a year, and easier to borrow a brace of chambers of your neighbours for a night than a bag of money for a twelvemonth. He tells us that a weather-cock was often called a beggar-man in those days, and writes of the sky as the cope of Heaven. In building he says:—"Let not the front of your house look asquint on a stranger, but accost him right at the entrance." And concerning timber and trees, he says it is worth every builder's while to get Spenser's lines about trees to heart, and gives them in full. A gnomon was called a cock o' the dial.

It is, however, to more practical items in his experience that we would call attention. He tells us that one Rubble, a mason in Rootham, in Kent, had offered to teach a thatcher, for a small matter, how to thatch a roof so that no mouse or rat could get into it, but that the thatcher, thinking the secret would be of no use to him, declined to purchase it. The Rootham mason assured him he knew a thatcher who had 4d. a square yard more than the usual price for doing it in this particular manner. But still the thatcher declined the offer. "This," says Neve, simply, "is a thing worth inquiring after." Wages, of course, were on a different scale from those of the present day. He makes out various bills for the instruction of his readers, and from these we glean that a bricklayer and his labourer would lay about a thousand bricks in a day, but if very efficient as many as twelve or thirteen hundred. For a day's work for himself, or the master, he puts down 3s., for the man 2s. 6d., and for the labourer 1s. 8d. The price of the bricks differed, too. Mr. Wing reported they were only 12s. per thousand at the kiln in Rutlandshire; and Mr. Leybourne never knew them to be cheaper than 9s. nor dearer than 18s. in London. In Sussex and Kent Mr. Neve knew them to be sold for 16s. a thousand, though at some places, where they lay them two or three miles distant, they were 20s. The price of making the bricks is thus told:—"In the country their usual price is 6d. per thousand for the moulder, the bearer-off hath 4d., and he that tempers the earth ready for use hath 4d. per thousand, and he that digs it hath 6d. per thousand. For making the earth ready (after it is digged, the digging not being reckoned into the making), moulding, bearing-off, &c., and burning, their usual price is 5s. per thousand." In the city there was a division of work into tiling, walling, chimney-work, and paving; but in the country a bricklayer was generally a mason and a plasterer, too. Materials in some items are altogether changed from those in use in 1736. Wooden pipes for the conveyance of water were then the alternative of the expense of leaden ones. The best kind were made of oak and cost 20s. a yard, or half the price of lead; but, says Mr. Neve, "iron pipes are now growing into vogue." Pipes made of alder were the cheapest of all; they were bored for about 10d. or 12d. per yard, but being necessarily small, were not strong enough to bear much force, and were consequently only available for gentle streams or small springs and short distances. The pump-makers about London, he says, made use of fir for pipes; but elm was stronger, and it might be cut down, hewed, or bored from 8d. to 20d. a yard, "5d. or 6d. a yard boring being a sufficient allowance." He also mentions square pipes made of elm plank as resulting in less waste in cutting. He says nothing about the divining-rod as a means of discovering water, but recommends the following proceeding in searching for springs:—"If you lie down on the ground, in places where you would seek for them, before the sun rises, and having placed your chin as close as you can, till it is, as it were, propped by the earth, so that the adjacent country may be plainly seen (the reason of this posture is, that by this position the light will not wander any higher than it ought): If you keep your chin unmoved, it will give a certain definition, and true level of the parts where you are plac'd, and in those places where you see vapours gathering themselves together and rising up into the air, there you may dig; for this sign never happens in a dry place." Further on he remarks that there is not a more certain sign of water in the world than when the alder tree grows naturally in a place. But we pause to consider the water-seeker of those days taking off his three-cornered hat, and smart with his ruffles, buckles, wig or queue, getting himself into the position indicated above.

Our author relates there was an attempt to introduce saw-mills driven by wind and water, as in Holland and other places abroad, but Parliament interposed for the sake of the families that would have been impoverished by the loss of the hand labour. "By this means," says our author, "an useful improvement is not only lost to the kingdom, but foreigners are thereby enabled to underwork and undersell us in all sorts of building materials that require the saw. Much better would it have been, as we humbly presume to think, if the Parliament, at the expense of the publick, provided for the poor families some other way that would have yielded them equivalent maintenance for life, and suffer'd the public to reap the advantage of the improvement; and every builder might have been tax'd what he would have sav'd by the mill-sawing, towards their provision. And as no more than a small limited number should have been brought up to the business for the future, this charge would have soon been over." The price of sawing up oak varied from 2s. 8d. to 3s. 6d. per 100 superficial feet. The sawing of ash and beech was rather more, in some places touching 4s. per 100 ft. An experienced sawyer told him they sometimes cut ship-planks for 10s. the load. The lowest rate in Sussex was 6s. the load, but as they built at Tunbridge Wells it was 7s. 6d. or 8s.

Of glass, our author describes ten kinds: Crown, made at Ratcliff and Lambeth; French; German, two sorts, white and green; Dutch; Newcastle; Staffordshire; Bristol, looking-glass; Jealous, or wrinkled, so that one cannot distinctly see what is done on the other side of it; and Woolwich glass. The Ratcliff Crown glass was 9d. per ft., and when wrought in lead and set up 1s. 6d. The Lambeth variety was 8d. in squares and 1s. 4d. when wrought and set up in windows. Mr. Leybourne gave his experience that the price of Newcastle glass was uncertain, because when coal was plentiful it was cheap, and when coal was scarce it became dearer. A London glazier, however, stated that the most common price of it was 34s. per case. Woolwich glass, by reason of some discouragement, ceased to be made.

The prevalence of diamond panes is indicated in the association of lead with the glass in many of the computations given. "For taking down quarry-glass and soddering it anew, and banding and setting up again, the usual price is 1½d. per foot; but if it be in churches where they say they have usually more banding, &c., their price is 2d. per foot. They have also 2d. per foot for taking down, scouring, soddering, banding, and setting up again the old-fashion'd work, which is composed of pieces of glass of different sizes and figures."

Some of the definitions in their simplicity remind us of that famous chapter on snakes in Ireland. The word dial, for instance, is said to represent what is so well known as to need no description. Some, again, tell of considerable confusion. Thus, a confessional is described as "a place in churches, under the main altar, where anciently the bones of deceased martyrs and confessors were deposited;" and a steeple is said to be "a well-known pile built at the west end of a church to hold the bells, &c." It is called a spire when it ends in a sharp point, and a tower when otherwise. But there is a prescience of possibilities here and there that have since come to pass. Neve had a thought, he tells us, that something might be done in the way of making mantel-pieces, mouldings, and architraves, door and window frames of similar materials out of which bricks were made. "If men of this profession," he goes on, "would set their minds to contrive some good composition of earth, and a way to manage it well in moulding, burning, &c. But, the more is the pity, men of this profession too generally partake of the materials they work upon." Probably, if he saw the use now made of terra-cotta he would be less disdainful of the characteristics of brick-burners. A touch, too, here and there, tells of innovations then making their way. More than once he refers to the new custom of placing closets in rooms. Painted wainscot he speaks of as now so much used. He dwells, too, on the importance of a healthy situation for a house, quoting Dr. Fuller, a prebend of Sarum, who put it forcibly that air being a dish one feeds on every minute, it had need be salubrious. We may gather that cisterns were considered to be well-placed in cellars; and that for a basin or reservoir the clay should be first well wrought with the hands and then trodden in with the naked feet. In connexion with the ornamental rose, he tells of that custom among the ancients of placing a rose on the ceiling of rooms where they met for companionship, to intimate that all restraint might be laid aside with the certainty that nothing said there would be repeated elsewhere, and remarks, somewhat cynically, "we all know people who ought to meet under the influence of the symbol."

There is but little difference observable in the spelling of most of the words used in technicalities. The skreen is now the screen, of course, just as the spaw is now the spa. Stuck has lengthened out to stucco nowadays. Speaking of statues, Neve says:—"Several statues are made in stuck. These figures are for the ornament of ceilings, frieses, and cornices. As to the making of figures, the first thing is to form the soul of plaster," and when this psychological feat is performed, then the soul is covered with stuck, for which the workman had proper tools. A contemporary tone may be noticed in the mention of the ingenious Mr. Allen (people were often ingenious in those days), who lived in Bath, and owned the quarries there. Neve says he was justly esteemed an honour to the Bath, but he should say the less of him and his quarries because they are so well known to the politest part of the kingdom, "who have now two inducements for going to Bath; the first, the wonderful and salutiferous waters that have justly renowned that place for so many ages; and the other, the surprising effects of this gentleman's extraordinary genius which appear in the works and inventions we have mentioned (for lifting and conveying stone), and others that are still every year rising under his direction, to engage the admiration of the curious."

And as we close the embrowned volume to put it back in its place, and give a glance to its still glossy chestnut-hued cover, we think of the beaux and belles of Bath before Miss Austen set them down in black and white, or Beau Brummel ordered the rules and regulations of the assemblies; and still more of the thatchers, bricklayers, and ill-paid brick-makers, masons, plasterers, smiths, carpenters, glaziers, slaters (Neve makes no mention of Welsh slates, though he notices a difference recorded by the barometer between the top and base of Snowdon, and says slates were

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chiefly used for summer-houses and banqueting-houses in gardens as being light and lasting), tilers (he calls them "tylers"), who helped to make up the more workaday world so long ago; and most of all, perhaps, of the self-styled Philomath, the lexicographical Neve, and his friends Wing, Leybourne, Switzer, and Miller. The last-named, by-the-bye, is still quoted in the fashionable books on gardening of the present day. Linnæus styled him the Prince of Gardeners. The Chelsea Gardens were in his care from 1722 to 1771. S. W.

MESSRS. DOULTON & CO., LIMITED.—The King has granted permission to Messrs. Doulton & Co., Limited, to use the title "Royal" in describing their potteries and manufactures.

WELSH CALVINISTIC METHODIST CHAPEL.

THIS chapel was erected last year for the congregation of Welsh Methodists at Mile End. The front towards the Mile End-road occupies the site of three old houses. The central opening gives access to the ground floor of the chapel; the two side openings to staircases leading to the galleries. The chapel itself is lit by a large octagonal lantern light in the roof. It provides accommodation for about 400 people. At the back is a large vestry, with lavatories, &c., and a large yard at present unbuilt upon, but on which it is proposed at some time to erect schoolrooms and classrooms. The contractors for the building work generally were Messrs. Falkner & Sons, Ossory-road, Old Kent-road, S.E.; the terra cotta was supplied by the Burmantofts Company; the steel work was carried out by Messrs. Fawcett & Co.; and the heating apparatus was provided by Messrs. Haden & Sons. The work was carried out from the plans and under the superintendence of the architects, Messrs. Young & Hall, Southampton-street, Bloomsbury, W.C.

APPOINTMENT.—Mr. Reginald Brown has been appointed Surveyor and Engineer to the Southall-Norwood Urban District Council. He was selected from over 100 applicants. Mr. Brown was for two and a half years Chief Surveyor, Stoke Newington; six years chief Assistant-Surveyor, Ealing; and about two years Assistant-Surveyor, Brentford.

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THE ARCHITECTURAL ASSOCIATION :

FIFTH SUMMER VISIT.

A VISIT of the Architectural Association took place on the 24th inst. to Cambridge, the main object of the visit being to see Mr. H. T. Hare's new Presbyterian College. On arriving in the town, the party immediately proceeded by way of Trinity College to the building, which is situated in Madingley-road and was erected two years ago. Mr. H. T. Hare kindly accompanied the members, who were received at the building by Mr. William Saint, the contractor, and Mr. Smieton, the Bursar. At 1 o'clock the members were hospitably entertained by Mr. Saint in the large dining hall, by permission of the college authorities, and afterwards, under the guidance of Mr. Hare and Mr. Saint, inspected the building. It has been erected for the Presbyterian Church of England, and is called "Westminster College." At present, accommodation is provided for only twenty-six graduates, but Mr. Hare has arranged for future extension and also for a chapel. For the time being, part of the library is used for this purpose.

The main buildings consist of Principal's house, dining-hall, with kitchen and offices, suites of rooms for students, and a large common-room. The library and combination-room are on the first floor. In the grounds are two houses for professors. The garden and terrace were designed by the architect and the main entrance has now some stone gate-piers and high wrought-iron gates. A full description, with plans and elevations, appeared in our issue of May 15, 1897, so that a detailed account is not necessary.

Before leaving, the members were entertained to tea by the Bursar. Then the party walked along the "Backs" to the Trinity Library, and then Kings College Chapel was visited. A move was then made to Pembroke, to see the library, and also the new work by George Gilbert Scott. From there the members went to the New Geological Museum, which, by the courtesy of the architect, Mr. T. G. Jackson, R.A., was open for their inspection. This building was illustrated in our issue of May 12, 1900, but only part is being proceeded with at present; when finished it will have frontages to three streets. It is being erected as a memorial to the late Professor Sidgwick, a statue of whom, by Mr. Onslow Ford, R.A., will be placed in the building. The roof is not yet on, so that internally there was not much of interest to see. Mr. Robert Edwards, the clerk of the works, conducted the members over and explained the various points of interest. Externally, it is of brick with stone dressings. The bricks are from the Crawley district of Sussex. The contractor is Mr. W. Sindall, of Cambridge.

The party then visited Peterhouse and looked at the windows in the chapel, the one over the altar being a copy of Rubens' famous picture of the Crucifixion which is at Antwerp. The side windows are filled with glass from Munich, depicting various Biblical incidents. More interesting, perhaps, to the members were the very fine windows in the hall and combination-room, some of them designed by Sir E. Burne-Jones, and all executed by the late Mr. William Morris, who also is responsible for the decoration and carpets in these rooms. As there was still time, visits were made to Emmanuel and Queen's, and the party then left for London. The members much appreciated Mr. Hare's kindness in personally showing them not only his own work, but the various colleges visited. The arrangements of the visit were made by Messrs. W. H. Raffles and F. D. Clapham.

Illustrations.

LLOYDS REGISTRY OF SHIPPING.

THIS building has been erected for Lloyds Register of British and Foreign Shipping. It is situated in, and forms a feature of, Fenchurch-street, and the new street named Lloyds-avenue.

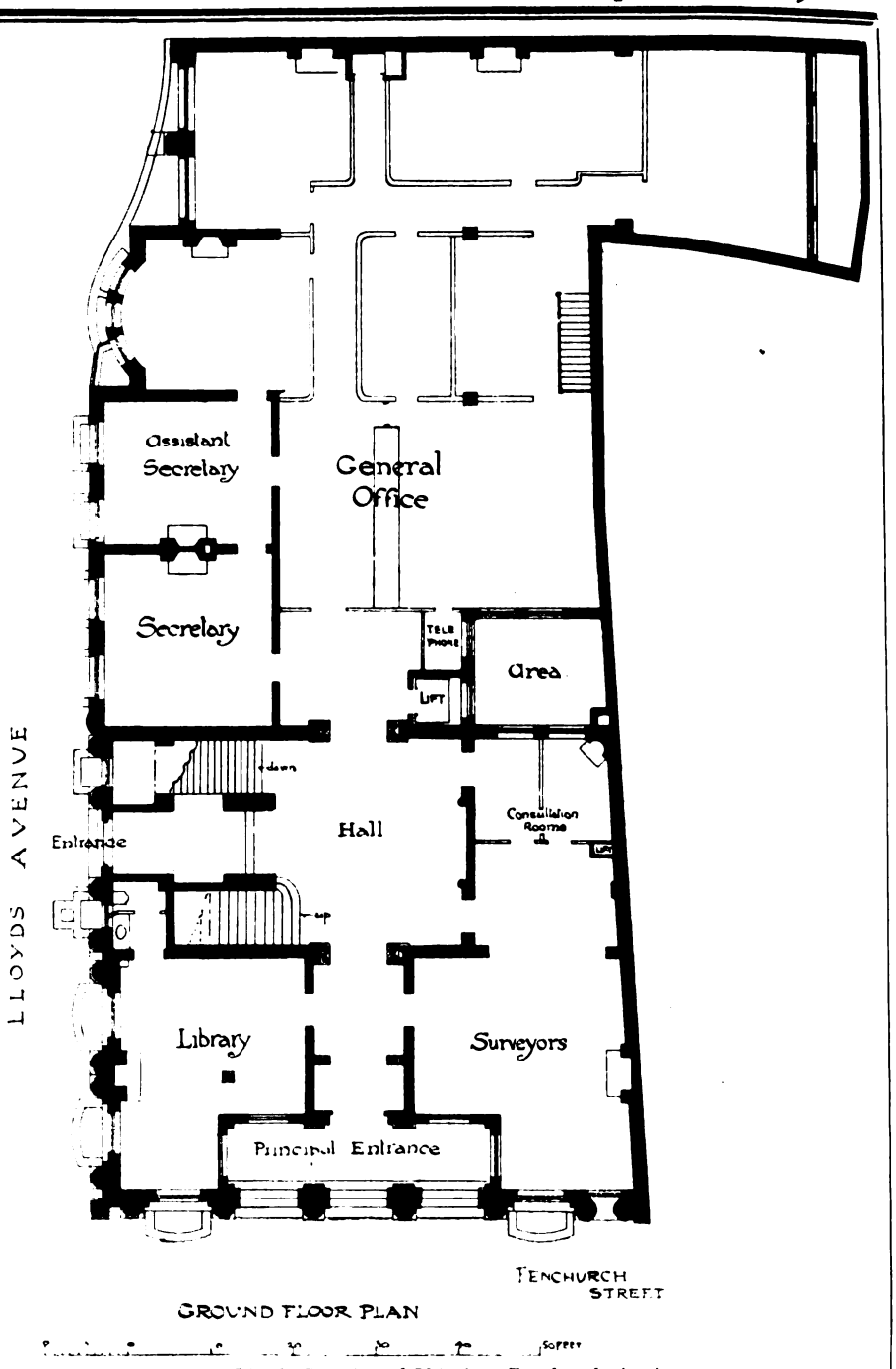
The whole of the two elevations is faced with Portland stone, the sculptured work being from the designs of Mr. G. Frampton, A.R.A., and the ornamental carving by Mr. J. E. Taylerson.

The boardroom is 47 ft. by 28 ft., and has an elliptical ceiling carried by marble columns, between which is inlaid mahogany panelling. The ceiling is being decorated by Mr. Gerald Moira; over the principal fireplace is a large marble sculptured panel by Mr. H. A. Pegram.

The staircase and entrance-hall are lined with Devonshire marbles. The staircase has on the first floor a bronze and ivory frieze, designed and executed by Mr. F. Lynn Jenkins—one panel of this frieze occupied a prominent position in this year's Royal Academy Exhibition.

The Committee-room is panelled in English oak, and the library in African mahogany with inlaid ornament.

The marble work has been executed by Messrs. Burke & Co. and Messrs. Jenkins & Sons, of Torquay, and the ornamental plastering by Messrs. Jackson & Sons. The general contractors for the building were Messrs. John Mowlem & Co., and the whole has been carried out from the designs and under the superintendence of the architect, Mr. T. E. Collcutt.



Lloyds Registry of Shipping, Fenchurch-street.

"THE ENGLISH RENAISSANCE."

THE illustrations of Houghton, Norfolk; mural fountain, Bowood, Wilts; and details of Great Hall, Winchester School, are from Messrs. Belcher & Macartney's "Later English Renaissance" and are referred to in a review of that work on another page.

CUPOLA, QUEEN'S COLLEGE, OXFORD, AND OLD HOUSE, LUDLOW.

THE cupola to Queen's College, Oxford, is the central one to the outer quad, while the old house, Ludlow, is a typical example of woodwork in that part of the country.

EDWIN FORBES.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

HAVING in their summer meeting last year visited the southern part of the county of Gloucester, and made an incursion into Wilts, the members of the Bristol and Gloucestershire Archæological Society made their headquarters this year in the eastern portion of their own county, and in their excursions took in a district of Worcestershire. The Bristol contingent and those from the upper part of the county united at Ashchurch on the 20th inst., and were then conveyed to that most interesting town, Evesham. The name is derived from Eves ham, "the dwelling on the level by a river's side," but traditionally from Eeves, a swineherd, whose marvellous narration led to the foundation of the abbey in 701. He saw, so he related to Ecgwyn, Bishop of Worcester, the vision of a lady, whose glory darkened the sun, and her beauty above that of women, with two female attendants. The bishop went in search of the apparition and found the lady in a wood, decked with a cross of gold and in robes whiter than the lily and more fragrant than the rose. King Ethelred, when he heard of the vision, gave a site, Ecgwyn built St. Mary's Minster, and became the first abbot. At the

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battle of Evesham in 1265 the abbey was desecrated by the massacre of the fugitives who fled for refuge to it. The tourist of to-day is enabled to see a singularly beautiful gate tower and two churches standing in the same cemetery, and rising from a gentle elevation sloping to the meadows which skirt the banks of the Avon. The churches of St. Lawrance and All Saints were both erected by the inmates of the abbey for the inhabitants of the town. As to the Benedictine mitred abbey of St. Mary the Virgin, the church stood immediately south of All Saints and south-east of St. Lawrance, so that the north-west angle of the nave of the abbey church was in a line with the south-east angle of the south aisle of St. Lawrance Church. Numerous fragments, richly carved and gilt, have been found on the site.

The party first entered the church of All Saints, being received by the Rev. J. H. Walker, the vicar. Mr. H. A. Prothero described some of the features of the church. Of the two churches All Saints' is the larger and more architecturally varied. It consists of a west porch, west tower, nave, aisles, transepts, Lichfield chapel, chancel, and vestries. Outside, the most unusual feature is the very rich sixteenth century west porch, with entrances north and south, a fine moulded west window, and very high open parapet. The church, about 130 ft. long by 73 ft. at its widest part, has an early arch opening into it from the porch, on the north side of which is a stoup. The nave of four wide bays is divided from the aisles by a continuous arcade to the south, and three arches with a break and a transeptal arch on the north; above which is a low clearstory with quatrefoil windows, and the whole is covered by a tie-beam roof. The great feature of the interior is Abbot Lichfield's Chantry Chapel of Our Lady of St. Ecgwyn. The very gorgeous roof of fan tracery is worked in two circles, two semi-circles, and four quarter-circles. The pendant, a very rich one, is in an unusual place at the side against the wall. A design of roses surrounds the shield and monogram of Clement Lichfield. The old altar and reredos have disappeared, also the old glass; otherwise the chapel is uninjured. In the church are hung up lists of the abbots from St. Ecgwyn to Lichfield and his nominal successor, also of the vicars of the two parishes from 1535 to 1647, and of the united parish from 1662 to the present time.

St. Lawrance Church, though showing some traces of earlier work, is, in the main, a simple sixteenth century church, built straight off as one now sees it. Its history appears to be that it was entirely rebuilt by Abbot Lichfield, and perhaps barely finished when the abbey was seized.

When the party had spent an hour in Evesham they entered their vehicles and were driven to Wickhamford, where they were received at the church by the Rev. W. H. Price, having passed the Grange, a fine half-timbered mansion restored by Lord Sandys. The church of Wickhamford consists of a nave, chancel, and western tower. The "three-decker," the screen, the western gallery (the front of which remains), the seats, and the royal escutcheon are all of seventeenth century date. The carvings of the Virgin and Holy Child on the pulpit are very unusual and very interesting, considering the date. An inscription says that the church was restored and beautified by Lord Sandys, of Ombersley Court, in 1841, and it is stated that the pews and gallery were brought from a church in London by Lord Sandys. On the north side of the chancel is a double alabaster monument, supported by five pillars and two pilasters, on the two slabs of which lie respectively the effigies of Sir Edmund and Lady Sandys and Edwin Sandys and his wife, Penelope. On the front of the tomb are the kneeling figures of the sons and daughters, and above are the figures of Faith, Hope, Charity, and Time, and various coats of arms on shields or lozenges. On the north side of the sanctuary is a flat stone to the memory of Penelope Washington, bearing the family arms, supposed to be the original of the stars and stripes on the flag of the United States.

Chipping Campden was the next place in the route. The town derived its first name from *Ceapan*, to buy, and, like Chipping Sodbury and Chipping Norton, was a market town of some importance, and a trading centre for Cotteswold and Welsh wool. It had a charter from Henry III. and James I., and grants of fairs, &c., from the early lords of the manor. The Corporation was abolished in 1883. Baptist Hicks built Campden House at Kensington in 1612, and commenced the construction of a splendid mansion at Campden in the following year. In 1620 he was created Lord Hicks of Ilmington, and in 1628 Viscount Campden. He died in 1629, and was succeeded as lord of the manor and Viscount Campden by his son-in-law, Sir Edward Noel, who died at Oxford in 1642. During the Civil War, Campden House was occupied in turn by the Puritans and Royalists, and in 1645 it was destroyed by Sir Henry Bard, who had held it for the King.

There was a meeting at the Town Hall, and the Rev. T. Carrington, the vicar, was voted into the chair. He said he hoped the Society would have pleasant memories of their quaint old town, and vacated the chair in favour of Alderman Fox. The annual report was read by the Rev. Canon Bazeley, and stated that there were at present 385 annual members, eighty-two life members, and three honorary members on the Society's list, giving a total of 470 members, as against 409 in July, 1900. The income of the Society for the year ending December, 1900, including a balance of 41*l.* 11s. 3½d., was 664*l.* 12s. 6½d., and the expenditure for the same period was 238*l.* 4s. 9d., leaving a balance at the Society's bankers of 426*l.* 7s. 9½d. on December 31, 1900. From that balance, however, should be deducted the cost of the Society's "Transactions" for 1900, the first part of which had been issued to the members, and the second part would be in their hands in October. Volume xxiv., part I., for 1901, would, it was hoped, be issued before the end of the year. Besides the balance of 426*l.* 7s. 9½d. the Society had a funded capital of 632*l.* 3s. 10d. The investigations which were commenced on the site of the Cistercian Abbey of St. Mary Hayles in 1899 were continued in 1900, and the abbey church was carefully excavated under the superintendence of Mr. St. Clair Baddeley and the general secretary. The excavation had been temporarily suspended owing to the sale of the Toddington estate, but it was hoped that they would be recommenced next year. The Council had gladly adopted the suggestion of the Congress of Archæological Societies that a list of the monumental effigies in Bristol and Gloucestershire should be compiled under the direction of that Society. The Committee nominated the re-election of the President of the Council, the Vice-Presidents, and the other officers.

Mr. T. Sherwood Smith moved the re-election of the following gentlemen as members of the council, viz., the Rev. J. M. Hall, Canon Ellacombe, Mr. G. S. Blakeway, Mr. H. Medland, and Mr. C. H. Dancey.

Mr. Scears seconded the resolution, which was adopted.

On the motion of Bishop Brownlow, thanks were tendered to Alderman Fox for his services as President during the past year.

Alderman Fox, in acknowledging the compliment, expressed the great aid he had received from Canon Bazeley. He then said that he desired to introduce to them his successor, the Earl of Gainsborough.

The Earl of Gainsborough then presided. He adverted to the changes which had taken place in the town, and spoke of it as a centre to which wool was brought from the Cotswolds. He was afraid places of that size in agricultural districts had not any chance of getting beyond their present prosperity.

The Vicar received the party at the church and gave some information as to the building. The Church of Campden is said to be dedicated to St. James. It would seem that this, or an earlier church, was dedicated to St. Mary the Virgin. It consists of a nave with north and south aisles which are continued eastwards, and a clearstory, a western tower, and a chancel with north chapel, now used as a vestry. Below the north side is a crypt. The nave has five bays on either side with lofty columns. The south chapel of the chancel has been used as a burial-place of the Hicks and Noel families, and contains four life-sized effigies and two busts. The chancel roof is said to have been the gift of Sir Baptist Hicks, who also was the donor of the Jacobean pulpit and the brass eagle. It was he who built Campden House at the beginning of the seventeenth century, and probably must be assigned to him the rebuilding of the porch, the caps of the turret staircases leading to the roofs at the north-west and south-west corners of the nave, and perhaps also the battlements and pinnacles of the nave. There is a quaintly-carved niche over the fifteenth-century doorway of the porch, which must be an insertion. In the middle of the south chapel on an altar tomb recline the superb alabaster effigies of Sir Baptist Hicks, Viscount Campden and his wife, Elizabeth, arrayed in mantles, ruffs and coronets. He died in 1629, and his widow erected this monument to his memory. On the south side of the chapel are the marble effigies of Sir Edward Noel, Viscount Campden, and Julianna, his wife, one of the daughters and co-heiresses of Sir Baptist Hicks. They died respectively in 1642 and 1644. They are represented as standing in a cupboard or tomb, enveloped in shrouds.

Old Campden House, adjoining the church, was also visited by the archæologists. At night a conversazione was held at the Town Hall, and papers were read.

On the 21st inst. the members proceeded in carriages to Ebrington. The village of Ebrington, with its quaint houses, was seen to signal advantage, and the party lost no time in inspecting the picturesque features which presented themselves. The Rev. W. Barclay read particulars respecting the church. It is stated that the name Ebrington is derived from the patron saint, St. Eadburgha. The place appears to have been the scene of a battle, as in a field not far from the vicarage, human skeletons, shields, and spear-heads of Saxon manufacture have been found. The church consists of a nave with south chapel, chancel, and western tower. The north wall of the nave has been rebuilt. The south window of the chancel and the east window of the south chapel contain some painted glass, given by Sir William Keyt, representing the life of Joseph, also the arms of Keyt, of Coventry, &c. On the north side of the altar the effigy of Sir John Fortescue Lord Chancellor in the time of Henry VI., lies on a handsome fifteenth century tomb, with a tablet erected to his memory by Robert Fortescue in 1677, and repaired in 1765 by Matthew, Lord Fortescue. On the south wall are the busts of Sir John Keyt, who died in 1662, and his wife Margaret, daughter and heir of William Taylor, of Brixworth, who died in 1669. The chancel arch is Perpendicular. Two pointed arches lead into the south chapel, which has an open timber roof. The doorway of the rood loft remains. The Late Perpendicular tower of two stages is embattled; it has four pinnacles, and a staircase in the south-east angle.

Hidcote House, about two miles from Campden, was the next halting place, permission to examine the mansion being readily extended by Major Wright. When his auditors were assembled on the green sward in front of the house, Canon Bazeley read some notes on the structure by Mr. E. Guy Dawber. The writer said Hidcote House stood on high ground and was a picturesque example of the seventeenth century architecture. It was built entirely of stone in the not uncommon "L" shape. The plan was entirely self-contained, there being no porch or bay window, or other projection. The house was dated 1663. The interior, as well as the exterior, was examined by the party, though much of the inside fittings is modern.

After leaving Hidcote the party were conveyed to Quinton, where the Rev. W. Bazeley gave some particulars in regard to the church. Quinton, which appears in the Domesday Survey as Quenintune, in the hundred of Ceolflede, was held in 1086 by Hugh de Grentmaisnil, of Lisieux in Normandy, one of the companions of the Conqueror. Hugh died in 1093, leaving a son, Robert. In the reign of Stephen, Robert Marmion, Lord of Tamworth, in Warwickshire, gave the church of Quinton to the nuns of Polesworth, and they held it till their convent was dissolved. The arches of the south arcade have capitals with scalloped edges and truncated cone mouldings, and short round piers cut square on the south side, but hollowed out with a square set off on the north side. This arcade is no doubt part of the original Norman church. The north arcade, with its pointed arches and small circular moulded caps, is Transitional Norman, and was probably added after the nuns of Polesworth obtained the church. The chancel is Early English, with characteristic moulding below the windows continued along the east wall. There are two deeply-splayed hooded windows, and one beautiful fifteenth century window on the north side. The windows on the south side are of the fourteenth-century

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style. The east window was walled up until the recent restoration. There is an Early English aumbry on the north side of the altar, and a bracket for a piscina of the same style on the south side. The tower has a single light window. The belfry windows are long, each of them having two lights and a transom. The parapet is embattled, and at each angle there is a crocketed pinnacle. The late fifteenth century ribbed spire has some ogee-headed windows, and near the top a band of Tudor flowers. The aisles and clear-story have no battlements. The east gable of the nave has a bell niche. The effigy of Sir William Clopton lies on an altar tomb under the south arcade. The brass effigy of Joan, Lady Clopton, lies on an altar tomb in the Radbrook Chapel. The figure is within an arched canopy.

The party then proceeded to Mickleton, and having inspected the church, they repaired to Long Marston, and then left for Chipping Campden via Burnt Norton.

At the conversazione held in the Town Hall there was a good attendance, and papers were read. The Earl of Gainsborough presided. A paper had been prepared by Mr. E. Guy Dawber on the "Domestic Architecture of Campden," but as he was unable to be present Canon Bazeley read it. The writer stated that Campden was almost unique amongst the many interesting towns of the Cotswolds, and within its small limits contained some beautiful examples of domestic architecture. It lay in the heart of the stone district, that material being used to the exclusion, almost, of all others, and they found there the genuine Cotswold common-sense stone building brought almost to perfection. Apart from the picturesqueness of the long street with the somewhat unusual arrangement of groups of isolated buildings, and the strong and sturdy character of its architecture, it was singular in presenting a group of buildings, designed evidently by one hand and erected within a few years of each other. Thus possessing all the charm and variety of the local work, they were stamped with a scholarly feeling and grasp of design and composition that imparted an air of distinction, apart from the other buildings of the town.

Mr. F. B. Osborne read a paper on the local grammar school, and Mr. Kennedy Skipton read a paper on "Sports in Gloucestershire."

Mr. W. St. Clair Baddeley referred to the monuments at Miserden Church to Sir William and Lady Sandys. He said the sculptor was an Englishman, Nicholas Stone, and the work was not Italian, as often stated.

On the 22nd inst. the members entered upon the final day of their gathering. A concluding meeting was held at the Town Hall, when a vote of thanks was accorded to the Earl of Gainsborough as President, on the motion of Mr. C. Bowly, seconded by Mr. J. Baker, and a vote of thanks was passed to Canon Bazeley, the General Secretary.

The first stopping place after the vehicles had been entered was Buckland, and to reach it the party journeyed past Campden House and the tithe barn, which were duly admired, Broadway was glanced at, and the view from the Tower, said to comprehend fourteen counties on a clear day, was to some extent taken in, though the mist which prevailed prevented the full extent being surveyed. When Buckland was reached the rectory was first viewed. The rectory house contains an ancient hall with some good fifteenth-century glass and carving. As in one of the windows appears the rebus of William Grafton, "a graft rising from a tun," the building of the hall, &c., may be attributed to this rector. Canon Bazeley described some of the interesting articles in the hall, and then a move was made to the church. The structure, dedicated to St. Michael, consists of a nave with north and south aisles, and a north porch, a chancel, and a square embattled tower at the west end. The three bays of the south arcade of the nave, and the two eastern bays of the north arcade, are late Early English or thirteenth century. They have plain chamfered arches with clustered semi-detached shafts and moulded bell-shaped caps. The responds of the two easternmost bays of the north arcade have each a single detached shaft. The chancel arch, the east and west windows of the north aisles, and a piscina in the south aisle, all belong to the thirteenth century church. At the east end of the nave on the apse of the gable is the cote which formerly contained the sanctus bell. The bell itself has been removed into the belfry, and is now known as the Ting Tang. Considerable changes took place in the fifteenth century. A clearstory was added to the nave, and the upper part of the tower and the western bay of the north arcade were built. The chancel was rebuilt, and the Perpendicular windows were inserted in the north and south walls of the nave. A low-pitched roof, as may be seen by the drip courses on the east wall of the tower, was substituted for the thirteenth-century roof. Some of the oak seats are relics of this second restoration; so also are the font and a richly-carved tomb on the north side of the tower. Canon Bazeley referred to the old plaster having been stripped from the walls. He said that architects were too fond of stripping off the plaster, which was often beautifully ornamented, and leaving the bare stone. They should be made to replace what was removed at their joint expense. Churches ought to be restored to something of their ancient state.

He explained the subjects in the ancient east window, saying that the glass was evidently of the time of Edward IV. It represented three of the seven sacraments—"Confirmation, Marriage, and Extreme Unction." There is a holy water stoup at the north door. In the nineteenth century restoration the plaster was ruthlessly stripped from the walls, and many interesting frescoes were irreparably destroyed.

Driving back to Broadway, the party were specially interested in the Grange. The fourteenth-century building, which is locally known as "The Priory," was originally a Grange of the Abbey of Pershore. When the Society visited it in 1884 it was found to be in a deplorable state of dilapidation, but it has been greatly improved by the present owner, Mr. F. D. Miller, and is now used by him as a studio. The Church of St. Eadburg was inspected. It is cruciform, comprising a nave, with narrow north and south aisles, a central tower, with external staircase at the north-east angle, north and south transepts, and a chancel. The north and south arcades of the nave are Transitional Norman, having each three bays with pointed arches, capitals with truncated cone mouldings and circular bases. Half the arches have square edges, the others are chamfered. The roof of the nave dates from the fifteenth century, and is somewhat higher than the pointed roof which preceded it. There are traces of thirteenth and fourteenth century work in the transepts and chancel. Most of the windows were inserted in the fifteenth century. The font is Early English. There is an escutcheon of Charles I., and a Jacobean pulpit with sounding-board, and another of fifteenth century work. A pillar almsbox is of an unusual form and very ancient.

Mr. Edgar Flower invited the Society to his residence, Middle Hill, situated on an eminence, and approached by a steep carriage drive. Middle Hill was built by Mr. William Taylor, Recorder of Evesham, in 1726, and was enlarged in 1776. It was for some time the abode of Sir Thomas Phillips, who filled it with his collection of manuscripts and printed works. It has been greatly improved by Mr. Edgar Flower, its present owner, who heartily welcomed his guests. They remained until the exigencies of railway travelling compelled them to seek their vehicles, and they were driven to Evesham, where the party separated, highly gratified with their three days' excursions.—The above has been abstracted from the interesting report which appeared in the *Western Press*.

BOOKS RECEIVED.

HINTS AND SUGGESTIONS AS TO THE PLANNING OF POOR LAW BUILDINGS. By Percival Gordon Smith, F.R.I.B.A. (Knight & Co.)

CONSTRUCTION OF ROADS AND STREETS. By H. Law and D. K. Clark. Sixth edition, with additional chapters by A. J. Wallis-Tayler. (Crosby Lockwood & Son.)

NEW OUTFALL SEWER AT ABERDEEN.—The Aberdeen Town Council has just accepted the tender of Mr. Peter Tawse, contractor, Aberdeen, to construct the portion of the main outfall sewer from Point Law under the new channel of the River Dee and thence to the sea at Girldleness, for the sum of 54,949*l.* 8s. 2d. Large iron pipes, 7 ft. diameter, will be used for carrying the sewer under the river, and on the Torry side of the navigation channel there will be a considerable amount of tunnelling through rock and deep excavations. The plans and specifications are by Mr. W. Dyack, M.Inst.C.E., Borough Surveyor, Aberdeen.

The Student's Column.

GAS AND GAS FITTINGS.

9.—GAS PRESSURE AND GAS GOVERNORS, PRESSURE AND CONSUMPTION GAUGES.

WHEN gas is required for the purpose of producing an illuminating flame it should be supplied at the point of ignition under very low pressure (say 0·6 in. of water), but when required for incandescent burners, or other burners in which air is admitted to produce a non-luminous flame, the gas should be supplied to the point at which it is injected into the mixing tube of the burner under a higher pressure (say 1½ in.). It is commonly stated that "atmospheric" gas fires are most efficient when supplied with gas under a pressure of about ¾ in., but although this may be true when coal-gas is used in nicely adjusted gas fires having clean burners and tested under favourable conditions in a room free from draughts, it is a statement which is likely to mislead the ordinary consumer.

In practice the burners are seldom perfectly clean, but are more or less covered with dust deposited from the atmosphere or dropped upon them from the overhead fireclay or asbestos fuel; consequently the gas ceases to issue in sufficient volume, becomes mixed with too large a volume of air, and "flashes back" when ignited, or burns with a short, noisy, green flame. Non-luminous flames, produced by admitting air before the point of ignition, have also a greater tendency to "flash back" under the influence of air draughts, caused by opening windows or doors, when the gas is supplied under a pressure of less than 1 in. than with gas under a higher pressure. Also the common practice of mixing carburetted water-gas with the coal-gas, and thereby increasing the specific gravity of the gas, necessitates the use of gas under a higher pressure than ¾ in. The main disadvantage attendant on the use of gas under high pressure is the hissing noise produced in the burner.

Initial or House Gas Governors.—The pressure of the gas as it leaves the consumer's meter varies considerably during every twenty-four hours in most districts, and to prevent it exceeding a certain limit at the points of ignition a governor is often affixed on the service-pipe close to the outlet of the meter. The object of the governor is to prevent wasteful consumption of gas, and to maintain a uniform pressure at the burners irrespective of the changes in the pressure under which the gas is supplied to the meter. When the pressure of the gas entering the meter is too low, or the meter itself is too small, governors are quite useless.

Governors should always be fitted in a level position, and in places where they can readily be inspected. By turning a screw or manipulating small weights the governors can be so adjusted that the pressure at the outlet will be maintained at any desired point lower than the pressure at the inlet. It is usual to recommend that the pressure be reduced to 1 in. when the usual number of lights are in use, but if incandescent burners or other appliances fitted with "atmospheric" burners are to be supplied in addition to burners for luminous flames, it is better to allow a pressure of 1½ in. at the governor outlet, and for the luminous flames to use governor burners, or Bray burners fitted with the "economisers" to be described in the next chapter.

The governor usually consists of a small chamber through which the gas flows, the inlet being partially closed by a small cone which automatically rises and reduces the size of the inlet orifice when the pressure increases, and which descends as the pressure decreases and thereby increases the size of the orifice through which gas can pass. In some governors the upper part of the chamber consists of a flexible leather diaphragm, which expands in an upward direction when the pressure increases and draws up the conical or semi-spherical plug which is connected to the diaphragm by a central spindle, and which controls the gas inlet orifice. The gas pressure required to raise the diaphragm and top plate is regulated by removable weights, or by turning a screw which regulates a spring pressing upon the flexible diaphragm. To obtain greater regularity of action the governor sometimes consists of two of these expansible chambers arranged side by side, and forms what is termed a "double dry governor."

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In Peebles's "mercurial" governor a small gas bell floats in a cup containing mercury, the

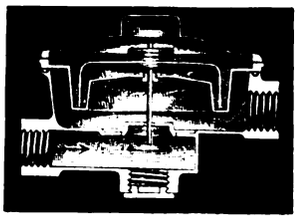

Fig. 15.—Peebles's Mercurial House Governor.

rise of the bell when the pressure increases causing a reduction in the size of the inlet orifice, and the gas pressure required to raise the bell being dependent upon the weight placed upon it.

One of these governors is sometimes attached to every appliance which consumes a large volume of gas, such as a fire or stove, as in such cases the saving effected by carefully governing the supply may be considerable.

Governor Burners.—Instead of, or in addition to, placing an initial governor at the outlet of the meter, the burners used may each be provided with a small governor, situated either in the body of the burner or immediately beneath it.

In Peebles needle burner (fig. 16) the chamber beneath the steatite burner tip contains a perforated conical float of white metal, and as the gas pressure increases the float rises and reduces the size of the orifice through which the gas escapes to the burner tip. The needle is an upright central metal rod which passes up inside the float and prevents it becoming tilted out of its proper position. The greater the pressure the smaller becomes the outlet orifice, while a decrease of pressure is accompanied by a descent of the float and consequent enlargement of the outlet orifice.

Fig. 16.—Peebles's Needle Governor Burner.

A great variety of burner governors are manufactured, but most of them depend upon the movements of a float which automatically reduces the size of the gas inlet or outlet orifice as the gas pressure increases, and enlarges it as the pressure decreases. They are mostly effective while maintained in good working order, but all require occasional inspection, as the accumulation of a little dirt within them, or the corrosion of the metal, is liable to put them out of action. Sometimes in float governors the float becomes jambed against the sides of the chamber containing it, and needs to be released by tapping the burner, or by unscrewing the base of the chamber and shaking it free.

Pressure Increases with the Elevation.—The specific gravity of coal-gas being much lower than that of air, the gas pressure increases as the height of the service-pipe above ground level increases, and decreases when the pipe is carried in a downward direction. A gasworks is usually situated on the lowest level in the district to be supplied, because a higher pressure is required to distribute gas downhill than uphill. The pressure on the top floor of a building is greater than in the basement, if no governor be employed. The increase in pressure is equal to about $\frac{1}{10}$ in. of water for every 10 ft. of elevation, and in lofty buildings a governor may with advantage be provided on the service-pipe at every elevation of 30 ft.

Pressure Gauges.—The simplest pressure gauge is a glass U-tube filled to about half its height with water, one end of the tube being open to the air and the other open to the air until connected to the gas supply-pipe. When both ends of the tube are open to the atmosphere the column of water is at the same height in both limbs; but when one limb is connected to the gas supply the pressure of the gas causes the water level to be depressed in one limb and to rise in the other. The height of the water level in the one limb above that in the other limb is measured in inches, and represents the pressure of the gas in inches of water. For convenience the water in the tube may be tinted with cochineal or soluble indigo, a scale graduated in tenths of an inch may be attached to the tube, and a stopcock and nipple may be fitted to the end of each limb; but these additions merely render the apparatus more convenient to use, and do not affect the accuracy of the readings.

Mercury Gauges.—For pressures higher than the maximum of 4 in. or 5 in. under which coal-gas is usually supplied, the U tube may be charged with mercury instead of water, mercury being 13·4 times the weight of water. Mercury gauges are sold having a scale on which the figures represent the pressure in inches of water, and the necessity of multiplying the readings by 13·4 in order to convert them into inches of water is thereby obviated.

High-pressure Gauges.—For measuring pressures of many pounds to the square inch spring gauges in a circular metal case, similar to those used for steam boilers, are employed.

Service-pipe Cleansers.—Service pipes and main-service pipes exposed to low temperatures sometimes become blocked with naphthalene or other matter deposited from the gas. To remove the obstruction the pipe is usually "blown out" with the aid of a force pump known as a "service cleanser," the removal being sometimes facilitated by introducing into the pipe a solvent, such as benzol, naphtha, or petroleum.

Consumption and Pressure Indicator.—Indicators are manufactured which show at a glance the approximate hourly rate of gas consumption of any ordinary gas-burner, and which may also be used as pressure-gauges. The consumption readings of the indicator vary with the specific gravity of the gas, and consequently an indicator adjusted to give correct readings with rich Scotch gas would not indicate correctly the consumption of burners tested with London coal-gas. The indicator must be adjusted by the manufacturer to suit the quality of the gas supplied in the district in which the indicator is to be used.

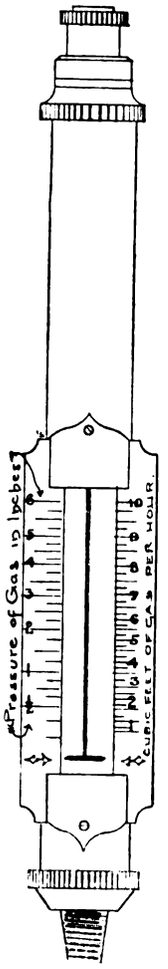

Fig. 17.—Consumption and Pressure Indicator.

To ascertain the rate of consumption of any burner the indicator is attached to the gas supply, and the burner is screwed into the top of the indicator. The gas entering the bottom of the indicator, passes through a glass tube, within which is a floating disc which rises to a height dependent upon the rate of flow of gas to the burner. On one side of the metal case containing the glass tube is a scale of cubic feet per hour, the consumption of the burner under examination being indicated by the position of the floating disc, which rises until opposite that figure on the scale which indicates the consumption. As the height to which the disc is raised is dependent upon the specific gravity of the gas, it follows that the instrument registers inaccurately when used with gases of widely different specific gravity, but for obtaining an approximate estimation of the consumption of different burners in districts supplied with gas of uniform specific gravity the apparatus is very useful.

To use the instrument as a pressure gauge a cap provided with the instrument is screwed on the top in place of a burner, and reference is made to another scale engraved on the opposite side of the metal case. The float rises as before, and the point at which the disc remains at a constant height indicates on the scale the pressure in inches of water of the gas under examination. Variations in the specific gravity of the gas do not affect the accuracy of the pressure indications.

Testing the Gas Fittings.—Gas services and fittings to be used with gas under ordinary pressures of less than 4 in. of water should always be tested under a pressure of 10 in. or 12 in. before being approved as gas-tight. A force pump and mercury or water-pressure gauge with connecting pieces form the whole of the apparatus required for testing; gas or air being forced into the pipes until the required pressure is obtained, and observation being made as to whether the pressure remains constant for a long period or gradually decreases. A leak-detector of this description is made by Harrison & Sheard, and quite recently a detector known as the "Wizard," in which benzoline is provided to render the air inflammable, and thus facilitate detection of the point of leakage, has been introduced by Falk, Stadelmann & Co.

[By a printer's error the sectional drawing of a dry meter (fig. 14), shown in the preceding chapter, was inverted.]

Correspondence.

To the Editor of THE BUILDER.

THE LATE MR. BRYDON'S GOVERNMENT OFFICES.

SIR,—It is strange that no one has suggested that for the superintendence of the above the Government should employ the late Mr. Brydon's highly-talented assistant, Mr. Arthur Hannaford, who was his intimate friend and *only* helper for a considerable time, and his right-hand man for years. Mr. Hannaford prepared details for most of his chief's works, including those in Bath; and I know that Mr. Brydon was most anxious to have his assistance again (he had left to go for health and study to Italy) when designing the Government Offices. It seems impossible to name a more suitable or better qualified man, as, considering the advanced state of the drawings at the time of Mr. Brydon's death, it would be easier for Mr. Hannaford to sympathetically work out the ideas of his dead friend and teacher than for other architects, who, if really "eminent," can less easily adapt themselves to another man's lines of work.

Whether Mr. Hannaford is available, however, I do not know. Z.

*** We gladly publish the letter of "Z.," who has no personal interest of any kind in the matter; but we are still of opinion that one of the most eminent architects of the day should be appointed to carry out the building, both in respect to the memory of Mr. Brydon, and as the best guarantee for the worthy execution of the work. Such architect, if appointed, might no doubt do well to avail himself, if possible, of the assistance of the gentleman named by our correspondent.—ED.

ARCHITECTURAL COURTS AT THE CRYSTAL PALACE.

SIR,—I do not know if your attention has been drawn to the present condition of the architectural courts of the Crystal Palace. After a lapse of some years, visiting Sydenham expressly to enjoy their beauties, I found my recollection had not done justice either to their extent or to the care with which they had been arranged. In some respects, the collection of casts surpasses that at South Kensington. The Medicean Dukes are not solitary, but supported by the allegorical recumbent figures; the Pistojan frieze is in one continuous length and at its proper height (although incorrectly coloured). There are no large models at Kensington of the Acropolis, the Pantheon, or St. Peter's, Rome, nor casts of English mediæval remains so varied as at Sydenham. But in what manner are these reproductions of the world's greatest art treasures displayed?

The principal Egyptian Court is now occupied by cooking-stoves, and its vistas destroyed by painted canvas backgrounds and imaginary battlefields, which at night produces a truly Egyptian darkness in the colonnades behind, duly appreciated by young people of both sexes. The Greek Court is appropriated to wounded and dying soldiers in khaki. The Roman Court has been execrably repainted, and is crowded with various casts of a period 1,500 years later than one would expect, and a series of models of modern battles, in glass cases. The Court of the Alhambra is evidently considered a "draw," for it has been properly redecorated and is free from intrusive objects. Truly the plants are not specially characteristic of Spain, neither does the untempered arc light (which effectually renders invisible the beautiful dome of the Abencerrages) recall the sunny clime of the Peninsula. The tile paving is worn plain, and the water plashes no longer in the fountain. However, some effort is made here to save appearances, and we

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cross the nave hopefully to the Byzantine Court opposite.

Here, however, birds are in possession, and the large aviaries render many of the casts unapproachable. The Mediæval Court is in somewhat better order, although the French and German vestibules contain displaced casts of other periods and nationalities to the confusion of the student. The Renaissance Court is at present occupied by an exhibit of armour and military costume, the partial cause of the overcrowding of casts elsewhere.

That Queen Elizabeth is practically screened from view renders the fact that she is buried beneath cardboard boxes and old newspapers less noticeable. She has been exiled from her own Elizabethan vestibule as this is required for a club, which is also in complete occupation of the spacious Italian Court beyond, so that these portions are no longer accessible to general visitors.

We are frequently reminded of the difficulty the Palace Company have in keeping the building open without loss, and, giving them the credit of knowing their own business best, one can but feel that the space the courts occupy can, in their opinion, be more remuneratively employed. Certainly at present the courts only provoke sadness to that section of the public who really care about them, while those who do not care about them would not mind their removal. Therefore one would suggest that, failing their acquisition by Government (which is scarcely to be looked for after Lord Salisbury's recent speech on State encouragement of art), some enterprising city like Glasgow, Liverpool, Manchester, or Birmingham, should make an offer for their acquisition, and thus form a nucleus of a great architectural museum.

F. HERBERT MANSFORD.

OBITUARY.

MR. C. ABBEY.—Mr. Charles Abbey, architectural sculptor, died at his residence at Rosemont-road, Richmond Hill, upon the 21st inst., aged sixty-five. Mr. Abbey was greatly esteemed by all who knew him. For some years he was in partnership with Mr. Charles W. Harrison in Dublin.

GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, LEEDS.—The foundation-stone has been laid of the new Congregational Church in Woodhouse-lane, Leeds, which will take the place of the East Parade Chapel that was purchased by an insurance company for 31,000*l*. The new church, having a capacity for about 1,000 persons, is planned and designed by Mr. C. F. Danby, and will cost about 25,000*l*. It is proposed to insert a stained-glass window in memory of three former ministers, Dr Cuder, Dr. Reynolds, and the Reverend John Ely.

CHURCH, BALLYCOTTON, EAST CORK, IRELAND.—The new Church of Our Lady Star of the Sea, recently built at Ballycotton, has just been dedicated. The style of the church is Romanesque. The dimensions are, roughly-speaking, 100 ft. by 50 ft.; height to ridge of nave 40 ft., and to cross of bell turret 70 ft. The nave is 25 ft. wide, and the aisles 12 ft. 6 in. each. The nave is separated from aisles on each side by arcades of five bays carried on columns of polished Aberdeen granite, with caps and bases of Portland stone. Above the bays of the nave there are on each side six clearstory cinquefoil windows, beneath which runs a string course internally of Portland stone. Between the chancel and nave there is a chancel arch springing from polished granite columns with Portland stone caps and corbels. There are two short transepts, gable roofed, which contain the altars, and the chancel portion of the aisles is separated from the body of the aisles on each side by arches. A winding turret stair of limestone leads to an organ gallery, which stretches across western end of nave, and beneath which there is a porch. The glass in this porch and in all the windows of the church is cathedral glass, and was supplied from the Youghal Art Works of Mr. Watson. For each of the six clearstory windows at each side there are two aisle windows, except in the spaces required for sacristy and porches. Behind each side altar there are two windows, and behind the high altar three. At the western end the nave is lighted by three windows, above which is a rose window. There is also a light at the western end of each aisle over the confessionals. The confessionals are of pitch pine, and made by Mr. Murray, of Youghal. The nave is filled with pitch pine benches made according to the architect's design by Mr. T. O'Brien, of Cloyne. The floor is of pine on breeze concrete, the porches and central passages being tiled. There is also encaustic tiling along the whole width of the sanctuary, all the tiling being the work of Mr. Nicholas Sisk, of Cork. The high altar of marbles and mosaics is by Mr. E. Sharpe, of Dublin. The walls lined with Youghal brick, are externally of Little Island limestone in pitch-faced ashlar masonry, set and pointed in cement. The architect is Mr. G. C. Ashlin, of Dublin, and the contractor is Mr. Jerh. J. Coffey, of Middleton.

SCHOOL, GIGGLESWICK, YORKSHIRE.—On October 4 the new chapel which Mr. Walter Morrison has presented to the Giggleswick Grammar School will be formally inaugurated. Externally the building is constructed of red and white stones, the dome, which is octagonal in plan on its exterior and nearly semicircular in section, being covered with copper. There is a small lantern with a cupola over the eye of the dome. In the interior marble, mosaic, carved wood, and stained glass have been plentifully used. The interior of the dome is covered with mosaic. Around the small eye, which admits light from the lantern, are figures of winged saints with golden halos. On the lower part of the dome are a series of angelic figures with uplifted wings, most of them bearing musical instruments. At the crossing of the transepts are four large figures of the Evangelists. The floor of the church beneath the dome is arranged as choir stalls, and is paved for the most part with black and white marbles. Immediately beneath the centre of the dome is a disc of Italian Brecchia, and around this are arranged in a circular design a pavement of verde antique and other marbles, including specimens of grey and green marbles from Ireland, Italy, and Greece. The northern transept is occupied with an organ loft, and in the south transept is a small gallery. The transepts and nave have waggon-head vaults, the former being stencilled with decorative designs. Most of the boys of the school will occupy seats in the nave, and at the west end are stalls for the masters. The nave aisles are very narrow, and will serve only as passages. They open into the church by three round-headed arches, with decorated capitals. The fronts of the organ and of the galleries and the stalls are designed, in harmony with the rest of the building, in the Tudor Gothic. The ends of the seats to be occupied by the boys have also elaborate carved borders, in which the foliage of many of the local plants is reproduced. The whole of the woodwork is of cedar. In convenient niches are to be placed statuettes of the late Queen Victoria and of King Edward VII., commissions for their execution having been placed with Mr. George Frampton, A.R.A. The windows are nearly all filled with stained glass. The east window is scriptural, the principal subjects being the Sermon on the Mount and the Ascension The west window is circular in shape. It shows the sun, moon, and stars, the earth, with the Tree of Knowledge in its centre, and the waters under the earth. Beside the Tree of Knowledge stand Adam and Eve, and around them are representatives of most of the principal groups of animals. The lion, tiger, rhinoceros, hippopotamus, reindeer, ox, sheep, kangaroo, crocodile, many birds, including the flamingo, and many fishes are depicted. In the nave windows are the full-length portraits of some of the great figures of our history. Alcuin, William of Wykeham, and Arnold of Brescia represent the monastic life. King Edmund, the saint and martyr, Sir Thomas More and Bishop Latimer are taken as representing the non-monastic religious life. Wycliffe, Bunyan, and Wesley are the typical Puritans. Columba, Henry Martyn, and Livingstone represent the noble band of missionaries. King Alfred, Sir Philip Sidney, and General Gordon are the fine types of English military life at its best, and Cædmon, Milton, and Tennyson represent English literature. A fine organ has been built in the church by Messrs. Henry Willis & Sons, of London. The stained-glass windows are all by Messrs. Burlison & Grylls, of London. The mosaic work is by Messrs. Powell & Son, of London. Mr. George Murray is the artist engaged in the decoration of the church; and the works have been carried out under the supervision of Mr. R. Evans as clerk of works. Mr. T. G. Jackson, R.A., is the architect.—*Bradford Observer.*

SCHOOL, PERTH.—The new Central District School, Perth, occupies the site of the old Middle Church Parish School in the Meal Vennel. Owing to the peculiar shape of the ground, it was found desirable to have all the classrooms facing one direction, in order to get the full benefit of the open space for light and air, and it was found necessary to construct the new school three stories in height. On the ground floor of the new school are three infant classrooms, each seated for seventy-two pupils; one spare classroom for forty pupils, to be used as a demonstration cookery classroom; a central hall, which rises the full height of the three stories; bathroom, cloakrooms for infants and girls, female teachers' retiring-rooms, boys' and girls' entrances, and staircase at either side. On the first floor are classrooms for Standards I., II., and III. each seated for sixty pupils; a combined workshop and practical cookery classroom for eighteen pupils, boys' cloakroom, and headmaster's private and retiring-rooms. The second floor contains three classrooms for Standards IV., V., and VI., each seated for sixty pupils. The walls of the central hall, staircases, and corridors have dados of cream-coloured tiles, and the classrooms have yellow pine dados to a height of about 5 ft. The architect is Mr. G. P. K. Young. The following are the principal contractors:—Masons, Messrs. Fraser & Morton; joiners, Messrs. James Hay & Son; plumbing work and heating, Messrs. Frew, Watson, & Co; plasterer, Mr. A. M'Ritchie, Dundee; slaters, Messrs. James Buchan & Son; glazier, Mr. C. Alexander; electric lighting, Messrs. Frew, Watson, & Co.; clerk of works, Mr. Robert Smith.

MUNICIPAL TECHNICAL COLLEGE, SUNDERLAND.—The foundation-stone of this building, which is situated in Green-terrace, near Bishopwearmouth Parish Church, was laid about a couple of years ago, and the formal opening of the completed edifice is to be performed on September 13. Designs for the new building were accepted in competition from Messrs. Potts, Son, & Hennings, architects, of London, and the building contract was secured by a local man, Mr. J. White, whose original tender was 17,683*l*., which, with the addition of various extras, will closely approach 18,000*l*. The building is English Renaissance in style, of red brick, with buff-coloured terra-cotta. The most conspicuous feature of the building is the corner block, which has been carried up as a square dwarf tower, topped by a miniature dome. In the basement, in addition to the physical laboratory, the heating apparatus, &c., provision has been made for working machinery, testing machines, and workshops fitted with all the requisite mechanical appliances. Chief among the various rooms on the ground floor is the examination and lecture hall, which measures 70 ft. by 30 ft.; while the leading divisions on the first floor are the chemical laboratory, which is 70 ft. long, 30 ft. wide, and 29 ft. high, and the chemistry-lecture theatre, these rooms having respectively accommodation for eighty-four and sixty students. On the second floor and in the tower are rooms for astronomical study.

CO-OPERATIVE STORES, BIRTLEY, DURHAM.—The foundation-stones of the new co-operative stores, at Durham-road, Birtley, have just been laid. The buildings are to be erected for the Birtley Co-operative Society by Mr. John Jopling, of Birtley, from designs prepared by Messrs. Liddle and Browne, Newcastle. The site is in the centre of the village, and occupies a position facing the Durham-road. The front of the building is to be of Ruabon red facing brick with stone facings, and it will have a frontage of 265 ft., and a depth of 133 ft. There will be eight shops on the ground floor, and on the first floor a large hall to seat 900 people. Provision will also be made for club and committee rooms, with secretary's and cashier's offices, &c. The whole is to be lighted by electricity, and plant will be laid down for that purpose. The total cost of the new premises is estimated at 20,000*l*.

ADDITION TO THE NATIONAL GALLERY, DUBLIN.—The work of building an addition to the National Gallery in Leinster Lawn, which was commenced in January, 1900, is fast drawing to a close. The building is an oblong structure, with a frontage facing Leinster Lawn of 54 ft., and a depth towards Kildare-street of 230 ft., and consists of basement, ground and first floors. The design is the work of Sir Thomas N. Deane & Son, the front being Italian Renaissance in style. The entrance is through a portico into a hall on the ground floor, off which will be the approaches to the basement and first floors. The basement is wholly occupied by store-rooms and the boiler-room, from which the entire building will be heated on the radiating principle. The ground floor, which will be the main gallery of the new building, contains, besides lavatories and other necessary arrangements, seven rooms, each room being about 30 ft. square and lighted from the north and south sides by fourteen side windows, 10 ft. by 14 ft. These rooms will contain the bulk of the gallery exhibits. The first floor will also contain seven public rooms besides the directors' apartments. The floor will be lit from the roof by lantern lights nearly 24 ft. square. The contractors are Messrs. Meade & Son. The building is fireproof throughout, the flooring being of steel joists and breeze concrete, and being finished on the ground floor in teak parquet, and on the first floor in Riga oak and pitch pine. The roof is flat, finished off with iron railings. The front elevation and part of the side elevation are in Portland stone and Ballyknocken granite from Osborne's quarries. The remaining stonework is Co. Dublin calp from Messrs. Meades' own quarries. The window dressings are of Athy stone brick. The Portland stonework was executed in Messrs. Meades' shop under the personal supervision of Mr. John Brophy. The woodwork throughout has been carried out in Messrs. Meades' premises under the supervision of Mr. Joseph Clarke. The carving is being executed by Messrs. Harrison & Sons. The total cost of the building will be about 30,000*l*.—*Irish Independent.*

NAPSBURY LUNATIC ASYLUM.—On the 20th inst., at the Guildhall, Broad Sanctuary, Westminster, Mr. E. A. Sandford Fawcett, A.M.Inst.C.E., the Inspector appointed by the Local Government Board, held an inquiry respecting the application of the Middlesex County Council to that authority for power to raise by loan the sum of 250,000*l*. for the purposes of the new lunatic asylum which they propose to erect at Napsbury, St. Albans, Herts. The County Council was represented by its architect, Mr. Rowland Plumbe, and the Deputy-Clerk, Mr. W. J. Austin. The site has been already purchased at a cost of about 50,000*l*., and the foundations for the main building are nearly completed. The new asylum, which is much needed to relieve the pressure upon similar institutions in Greater London, will be constructed to accommodate a total of 1,150 inmates.

CONVALESCENT HOME, SANDGATE.—On the 17th inst. the Alfred Bevan Memorial Convalescent Home for Men, Women, and Children, was opened at Sandgate. The institution, which was formerly known as the Beach Rocks Hospital, has been rearranged as an auxiliary to the Morley House Seaside Convalescent Home for Working Men, Dover, and is intended to perpetuate the memory of the late Sir Alfred Henry

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Bevan. Mr. G. D. Stevenson was the honorary architect.

ART SCHOOL, FALMOUTH.—The foundation-stone of the new school of art, in Manor Drive, Falmouth, which is to be a memorial of Miss Anna Maria Fox, was laid on the 19th inst. The architect is Mr. O. Caldwell, of Penzance.

ALTERATIONS AND IMPROVEMENTS, PRINCE'S THEATRE, MANCHESTER.—The Prince's Theatre has been altered and improved. Mr. J. Bland was the contractor for the structural alterations and the contract for the decoration and upholstery has been carried out by Messrs. J. Binns & Sons, of Halifax The structural and decorative work has been executed from the drawings prepared by the architects, Messrs. Darbyshire & Smith, and carried out under their personal superintendence.

NEW PUBLIC BATHS, WEST HAM.—It is announced that the Town Council of West Ham have resolved to build a swimming-bath, having a water area of 100 ft. by 35 ft., together with a Turkish bath, slipper-baths, and waiting-rooms. Provision will be made for using the swimming-bath, during the winter months, as a hall or gymnasium, and for the accommodation of 1,000 persons in the gallery and the additional floor-space which can be obtained by folding the dressing-boxes against the walls.

DRURY-LANE THEATRE.—During some weeks past extensive alterations and improvements of the interior of the auditorium have been in progress—the structural works being carried out by Messrs. Patman & Fotheringham, under the directions and superintendence of Mr. Philip E. Pilditch, who also has designed a scheme for the new upholstery (by A. R. Dean, Limited) and decoration. The improvements comprise a reconstruction of the stalls and the grand and first circles, the steel work for which is by Messrs. Drew-Bear, Perks, & Co., together with the removal of some of the boxes on the stall-floor, the widening of some of the gangways, a new exit-door in Russell-street, a fresh system of ventilation throughout the whole of the building, and a re-installation of the electric light supply in two services, either one of which will be available, in case of accident, for replacing the other, so that in such an event a recourse to gas will not be necessary.

CATHOLIC SCHOOL, ABERDEEN.—On the 15th inst. the new Roman Catholic School in Summer-street was opened. The school takes the place of the former Convent School in Huntly-street, which has become inadequate for the purpose. The new school was designed by Mr. R. G. Wilson, architect. Including the site, it has cost altogether over 5 000*l*., and provides accommodation for 267 pupils.

PUBLIC BATHS, CORK.—New public baths have been erected at Cork. There are two baths, each 75 ft. long by 30 ft. broad. The floor is an inclined plane, thus securing at one end a maximum depth of 6 ft. 6 in., and at the other the minimum depth of 3 ft. 6 in. The baths are approached at each corner by wooden stairs, and the bottom and sides are lined with white glazed brick, with two lines of coloured brick along the centre. Each bath is provided with fifty-eight dressing-boxes, and eight douche baths are attached to each swimming apartment. The main apartments will be lighted by two arc lamps, and the douche baths and other portions of the premises will be lighted with incandescent lights. There is a glazed roof. The dressing-boxes are made portable, so that in the winter-time, if it were found unnecessary to use both baths for swimming purposes, the boxes could be taken down, and the tank temporarily floored over and used as a gymnasium or for other public purposes. Attached to the bath premises is a steam laundry. The buildings are approached from Eglinton-street, there being two separate doors, one for each bath, with a central ticket office from which control of both baths can be obtained. The baths were erected under the superintendence of the City Engineer (Mr. H. A. Cutler).

SANITARY AND ENGINEERING NEWS.

LINLITHGOW DRAINAGE SCHEME.—The work of opening the pipe track in connexion with the new drainage scheme for the burgh of Linlithgow has commenced. The contractors are Messrs. Blair & White, Glasgow, whose offer for executing the work amounts to 5,164*l*. 18s. 11. The Council have now asked Messrs. Warren & Stuart, the engineers, to have the specifications for the septic tank works submitted without delay.

ABERDEEN HARBOUR IMPROVEMENTS.—In connexion with the erection at present going on of the single-swing bridge (with double line of rails) in line with Marischal-street, and between Victoria and Upper Docks, Aberdeen, the Harbour Commissioners are now to construct a temporary bascule bridge—64 ft. apart between pivots or axles, 14 ft. in width, being two footways 3 ft. wide each and a carriageway of 8 ft.—of strong steel, able to carry a six-ton lorry and a crowd of people. The work will be carried out by Messrs. Abernethy & Co., Ferry Hill Foundry, Aberdeen; and it is intended that the bascule bridge be utilised by being shifted to other parts of the dock when required. The plans are by Mr. R G. Nicol, Harbour Engineer.

STOCKPORT AND ITS WATER SUPPLY.—The growth of the borough of Stockport and of the residential and manufacturing districts surrounding it convinced the Corporation of the necessity of extending their water supply, and they have prepared a scheme which, when carried out in its entirety, will relieve the district of anxiety in the matter of ample provision for many years to come. The new gathering ground is provided by the great district of Kinder Scout. The scheme received the sanction of Parliament in the past session. It provides for the construction of three reservoirs at Kinder, in the parish of Hayfield. The reservoir to be first constructed will be made by an embankment across the river Kinder. The storage capacity thus provided will be equal to 624,000,000 gallons, and will give a daily supply of 2,000,000 gallons. The reservoir to be made as a second instalment of the work will be formed by the making of an embankment across the river Sett. Here a total capacity of 310,000,000 gallons will be created, with a daily supply of 1,500,000 gallons. As a third instalment a reservoir will be formed at Hollingworth Clough, with a capacity of 60,000,000 gallons, allowing for supply purposes 750,000 gallons per day. Adequate arrangements are made for the supply of compensation water. The total gathering ground is 4,560 acres. At the foot of the Kinder reservoir filter beds will be constructed, and from thence ample provision will be made for supplying the area included in the Stockport district. The engineer of the scheme is Mr. James Mansergh. The construction of the first of the three reservoirs will be commenced in the early spring. A period of ten years is fixed in the Act of Parliament for the completion of this portion of the works, but it is expected that it will be finished in seven or eight years. The Corporation obtained powers under the Act to borrow 756,000*l*. for works and 64,000*l*. for the purchase of lands, drainage, &c., in connexion with their scheme. The cost of the first reservoir, with the necessary mains, filters, service reservoirs, &c., is estimated at 350,000*l*.—*Manchester Guardian*.

PUMPING PLANT, ETSA DRAINAGE STATION, EGYPT.—We are informed that Messrs. Easton & Co, Limited, of Westminster, have secured the order for the pumping plant for the Etsa Drainage Station. The plant in question consists of six Lancashire boilers, two economisers, four vertical compound condensing engines direct coupled to four large centrifugal pumps, with all necessary steam and exhaust pipes, feed pump and feed-pipes, &c, and is designed to raise 6,500,000 gallons of water per hour against a head of about 15 ft.

SEWAGE SCHEME, WINDERMERE.—The Urban District Council have instructed Messrs. Beesley Son & Nichols, Civil Engineers, of Westminster, to prepare a scheme for the sewerage and sewage disposal of the town.

FOREIGN.

FRANCE.—The brick and iron church of St. Michel at Batignolles (Paris) is to be pulled down and replaced by a new church on a great scale.——M. Rochet, the architect to the Académie de Médecine, has received instructions to erect a crematorium in connexion with the Ecole Pratique de Médecine, Rue Racine. The special object is to dispose of bodies which have been the subject of post-mortem dissections, which have hitherto been interred at Père-la-Chaise.——The fine monument to Mdlle. Clairon, by M. Gauquié, illustrated some time since in the *Builder*, has just been finally erected at Condé-sur-l'Escaut.——M. Sandier, the architect who directs the art-work at the Sèvres manufactory, has been superintending the design and execution of a tower in porcelain, nearly 150 ft. in height, which is to be erected at Saint-Cloud, on the site of the former erection known as the "Lantern of Diogenes," which was destroyed by the Germans in the war. The site forms the highest point of the Saint-Cloud park.——The Public Works Department is about to construct a bridge over the Garonne at Bordeaux, opposite the Place Richelieu, in the form of a suspended travelling car.——A new Lycée is to be built at Paris, as an annex to the Lycée Buffon in the Boulevard Pasteur.——A committee has been formed at Paris to erect a monument to the celebrated furniture artist Boulle, whose name is permanently associated with a well-known type of French furniture of the seventeenth century. The design of the monument is entrusted to M. E. Jacques, sculptor, and it will be erected at the angle of the Faubourg St. Antoine and the Rue de Reuilly.——M. Gabriel Ruprich-Robert, architect-in-chief to the Commission des Monuments Historiques, is carrying out some researches and excavations on the summit of Puy-de-Dôme, among the ruins of a Roman building commonly known as the "Temple of Mercury." He has already brought to light a number of interesting relics, including a fine Corinthian capital in good preservation, and various specimens of pottery and coins of the Roman period.——A new basin is to be formed at the port of Boulogne, at an estimated cost of six million francs.

THE ARCHITECTURAL ASSOCIATION.—The prize of a silver medal and ten guineas, offered for the best monograph of Sir John Vanbrugh, with suitable plans and photographs, has been awarded to Mr. Gilbert H. Lovegrove, son of Mr. Henry Lovegrove, District Surveyor of Shoreditch

CAPITAL AND LABOUR.

STATE OF THE BRADFORD BUILDING TRADE DISPUTE.—The dispute in the Bradford building trades has now extended over sixteen weeks, and the prospects of any settlement appear to be as remote as they were when matters were brought to a crisis on May 1. Both employers and workmen are as firm in their attitude as ever, and to this extent the position of affairs may be said to remain unchanged, but in another aspect the situation can scarcely be described as so acute as it was in the earlier stages of the difficulty, from the point of view of either side. For some time past there has been a steady importation of non-society labour, until now, so far from building operations in the city being practically at a standstill, as was the case for some months, workmen officially stated to number two or three hundreds are engaged on several of the largest building undertakings. These include the Cartwright Memorial Hall, the Green-lane Board Schools, the electricity extension works, and the new Conditioning House. Mr. W. A. Forshaw, who has charge of the new labour bureau, reported that day by day a satisfactory number of applications are received, and that the new workmen are started as soon as their credentials are verified. He hazarded the opinion that, if the present rate of applications is continued, the places of the trade unionists will have been entirely filled up in the course of another month or so. It was also stated that there is a steady supply of masons, and that, at present, more joiners are forthcoming than the agency can provide with immediate employment. Mr. Forshaw declared that, in spite of the criticisms of the unionists, the quality of the work done by the non-society men is quite satisfactory. On the other hand there is a corresponding activity among the two trade societies mainly affected by the dispute in drafting their members to other districts. On May 1 the number of carpenters and joiners thrown out of employment was about 400, and the policy pursued has reduced the number on the books to 200. Similarly, as to the masons, the number on the books of the Bradford branch has diminished from about 500 to just over 300. It is stated that there is considerable activity in the building trade generally, and that in the great majority of cases the men have no difficulty in obtaining as much as 10½d. an hour, which, of course, is a penny an hour higher than the rate of wages upon which issue has been joined in Bradford. Some indignation has been aroused in the union by an assertion that its members are receiving a larger weekly allowance than their wages would ordinarily average in the course of a year. The allowance at the commencement of the dispute was 14s.; afterwards it was increased to 15s., and now so much support is forthcoming from other branches in sympathy with the Bradford men that the pay has been increased to 24s. a week, beyond which it is not likely to advance, however large the funds at disposal.—*Bradford Observer*.

MISCELLANEOUS.

PROPOSED ENLARGEMENT OF PADDINGTON TOWN HALL.—The Paddington Borough Council is considering a scheme for enlarging the present Town Hall at Paddington Green at an estimated cost of 20,000*l*. The scheme is being opposed on the ground that the building is not suitable for extension purposes and that a new building should be erected, even though it cost 50,000*l*. or 60,000*l*.

LEEDS MASTER BUILDERS' ASSOCIATION.—The annual meeting of the Leeds Master Builders' Association elected Mr. John Pickard president for the ensuing year. Other appointments were made as follows: Vice-president, Mr. G. Wilson; secretary, Mr. W. C. Ellisdon; committee, Messrs. J. T. Wright, W. H. Dews, W. Airey, C. Myers, W. Simpkiss, W. Oakes, and G. W. Nettleton.

THE ORDNANCE SURVEY.—During the twelve months ending with March 31 of this year the progressive work of the Ordnance Survey has been hindered through the absence of one-third of the officers upon the establishment who were withdrawn for active service in South Africa. In the course of the period under review the authorities published maps covering 4,950 square miles—an aggregate so far of 23,255 square miles—of their revision of the cadastral survey of all the counties of England and Wales, on the 1-2,500 scale, which was completed about twenty years ago. In the new series of 1-in. outline maps, of which the issue was begun in 1893, a fresh classification has been adopted for both public and private roads. In the first class are placed those which lead from one town to another and have a minimum width of a 14-ft. metalled roadway. The second class includes other metalled roads in a good state of repair and available for fast-wheeled traffic at all seasons, from and to villages, towns, and so on; all other metalled roads fit for wheeled traffic are assigned to the third class, whilst the fourth class includes unmetalled roads only. A coloured issue is made of these 1-in. maps for a large part of the South of England, mounted on canvas, and either flat or folded in a cover, for a charge of 1s. per sheet, measuring 18 in. by 12 in. The colours adopted are burnt sienna for metalled roads, brown for hill shading, red for contours, and blue for

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water. Of the reduction, to a scale of four miles to the inch, based upon the 1-in. survey thus revised, the Department have now published sheets representing 31,515 square miles of England and Wales. They have just completed the publication of the 1-2,500 maps of the cultivated parts of Scotland, having during the last twenty years made and issued their surveys for the counties of Edinburgh, Haddington, Kirkcudbright, Wigtown, Fife, and Kinross, and the Lewis. The one-inch outline maps of that country are revised and finished. Ireland is being re-surveyed, by an increased staff, on the 1-2,500 scale. The field revision and drawing are concluded for the new one-inch maps, and the whole country has been surveyed for the publication (which is now completed) of maps to a scale of 6 inches to one mile. The departmental publications, indexes, maps, &c, can now be obtained at most provincial post-offices, but it does not appear that the public have largely availed themselves of that medium of purchase.

CARRARA MARBLE INDUSTRY.—An official report published by the Italian Ministry of Agriculture, Industry, and Commerce shows the number of working quarries in the districts of Carrara, Massa, and Versilia to be 528, the number of quarrymen and workmen employed being 10,215. The year's output was 94 832 tons of sawn marble and 14,985 tons of worked marble, of the aggregate value of £421,301. The United Kingdom takes about 20 per cent. of the marble exported, France 14 per cent., Germany 11 per cent., and the United States 22 per cent. The actual quantity shipped to England was 10,653 tons of block, 19,766 tons of sawn, and 7,308 tons of "otherwise worked."

CHERBOURG STONE.—Writing from Cherbourg, Mr. Loftus, the British Consul, remarks:—"There are several firms engaged in stone-quarrying here, all of whom appear to be doing well, and showing an ever-increasing business. The stone derived from the Cherbourg quarries is principally adopted for use as road metal; the stone is broken by hand, and is shipped mostly in British vessels to ports in the south of England, such as Poole, Shoreham, Southampton, Newhaven, Dover, Ramsgate, Margate, Herne Bay, Rochester, Stroud, and the Thames. The stone shipped to these ports is termed screened, the stone being broken into pieces ranging from 1½ to 2½ in. in size. A slight misconception of terms should here be noticed, namely, that what is usually termed granite in England is here (Cherbourg) known under the name of quartzite, and it differs from the granite proper as found in the neighbourhood of Fermanville and Dielette in being much softer. A somewhat cheaper kind of stone is shipped to Llanelly and Bridgwater. The main trade is, however, in screened stone, and this export has shown a large increase during the last few years. The Cherbourg Quartzite Company, Limited, shipped 34,000 tons, the Kent Road Maintenance Company 55,483 tons, and other firms about 2,885 tons."

LEGAL.

A BUILDING DISPUTE SETTLED.

THE case of Savory *v.* Revill came before Mr. Justice Joyce, sitting as Vacation Judge in the Chancery Division, on Wednesday last.

Counsel stated that this was a motion to restrain the building of a wall. The case was in his lordship's list on the 21st inst., and stood over in order to allow the architects on both sides to meet and arrange terms. Those gentlemen had met and had been successful in coming to terms, and it was therefore desired to take an order in the terms of the minutes.

His Lordship: Signed by the junior counsel?

The learned counsel stated that the minutes had been signed by the solicitors for the parties in pencil. The other side were not now represented by counsel.

His Lordship said the other side must be represented by counsel to enable him to consent to the order as asked. He could not accept mutual undertakings, as these were, signed by the solicitors. On the learned counsel producing a consent brief, signed by counsel on both sides, to the registrar the order could go.

The learned counsel stated that this would be done.

BUILDING DISPUTE AT NEWCASTLE.

THE case of Reid *v.* Sanderson came before Mr. Justice Joyce, sitting as Vacation Judge in the Chancery Division, on Wednesday last, on a motion by the plaintiff for an interim injunction to restrain the defendant from erecting a certain building at Newcastle which would interfere with plaintiff's ancient lights.

Mr. Bramwell Davis, K.C., stated that the parties had been able to arrange matters. The property in question had been sold, and it had been arranged that the action should be discontinued, the plaintiff undertaking to bring no subsequent actions against the defendant, each party to pay their own costs. That settled the matter in dispute completely.

Mr. Alexander, K.C., who also appeared on the motion, said he consented to the arrangement mentioned by his learned friend.

Order accordingly.

BUILDING DISPUTE IN THE CITY.

THE case of Wriford *v.* Patrick came before Mr. Justice Joyce, sitting as Vacation Judge in the Chancery Division, on Wednesday, on a motion by the plaintiff for an interim injunction to restrain the defendant from building so as to obstruct the plaintiff's ancient lights.

Mr. Maugham for the plaintiff said that last week his lordship gave him leave to serve the defendant with the notice of motion and the writ, but it had been impossible to serve the notice of motion and the writ, and he had therefore to move *ex parte* for the injunction. He thought the truth was that the defendant, knowing that the action had been commenced against him, had made it difficult to serve him. The *locus in quo* was in Wood-street, Cheapside. The defendant himself was the building owner, and was himself a builder. He had a place of business in London, and he was also by his agents carrying on the building in question in the City of London. The writ and the notice of motion had been taken several times to his business address in the Westminster Bridge-road and to the place where the work was being carried on. The persons in charge of both places knew the defendant's present address, which was in the country, but declined to give it.

His Lordship, having looked at the plans, asked how long the building had been going on.

Mr. Maugham stated that the defendant started building last February, and ever since the plaintiff had been anxious to see the plans. The idea of the defendant undoubtedly was that if he could get the building up before he was stopped, the Court would not order him to pull it down. He (counsel) had several affidavits in support of the motion. Mr. Adams, architect and surveyor, had made an affidavit that the defendant's building would interfere to a highly objectionable degree with the plaintiff's ancient lights.

His Lordship: What do you ask for?

Mr. Maugham said he asked that the defendant should be restrained from interfering with the plaintiff's ancient lights until the trial.

His Lordship, after consulting with the Registrar, said he would give the learned counsel an order for substituted service of the writ and notice of motion on the manager or any clerk of the defendant by leaving copies at his place of business with the manager or a clerk there, or by leaving them with the foreman, architect, or any person in authority at the building in question. If this were done, and a copy of the writ and notice of motion were also sent by registered letter to the defendant at his place of business and the building, the learned counsel could take an *ex parte* order in the terms of the notice of motion, but subject to the defendant having the right to get it discharged on his showing that it ought not to have been made. The plaintiff would, of course, give the usual undertaking in damages.

Order accordingly.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

7,690.—A DRILL-BRACE: *P. C. Carstensen.*—In order that the feed-screw shall not be turned too far out of its nut, it is fitted with a shell of which the flange is notched, and is to be passed over lugs upon the nut as the drill is put together. Thus three or four threads will remain in the nut by impact against the projections concurrently with the feed of the drill.

7,695.—A WALL-PLUG FOR ELECTRICAL PURPOSES: *S. S. Galsworthy.*—The solid porcelain or similar base of the plug is pierced with pin-holes and a cap is screwed on to it. Nuts secure the square-headed pins. A grip for the wire is supplied by grooves and projections upon the base of the plug, which may have either a lug that fits into the socket, or a recess that will engage with a projection thereon.

7,715.—A WOOD-SAWING MACHINE: *E. Pollard and Pollard & Metcalfe.*—A compounded vertical and horizontal movement is given by the mounting of the saw upon a slide which a pivoted lever worked with a cam-groove upon a cam-disc will move vertically so as to feed the saw forwards and backwards. Another cam-groove upon the opposite side of the cam-disc works a swinging frame or lever that hangs from a pin, and to which a slide from the saw-shaft is pivoted, whereby the saw receives a horizontal movement equal to that of the lath or other material which a roller and a flat piece, carried by angle-levers, press against the table. Confer also No. 11,549 of 1898.

7,733.—AN ARTIFICIAL GRANITE; *W. F. M. Blackburn.*—An admixture is made of suitably coloured crushed marble chips and Portland cement moulded under pressure in a moist state. The block is immersed for some while in water, is allowed to become hard, and may then be rubbed and polished.

7,750.—A CONTRIVANCE FOR ROOFING PURPOSES: *W. R. Pryke and W. Palmer.*—So that their front edges may be lifted up, and that at the same time their backs may be kept away from the wall, the eaves-gutters are fashioned with flanges or projections upon their sides.

7,762.—A CHIMNEY-TOP: *H. John.*—The chimney-top is made up of a short pipe of which the square section at the foot-flange is merged into a round section at the top, and which is fastened on to the brickwork with four interior footplates. The footplates are loosely joined together with angle-pieces having holes with burred lips and teeth; upon each plate is also fashioned a cross-rib for a similar rib in the lining of mortar. The pipe carries a rotatory hood within which is a frictionless collar that fits the thickened base of the pivot-pin of the hood. The steep forms of the hood and its vane are devised for their being easily packed within the pipes, and for their being employed upon chimneys in close proximity to one another. In the case of tallboys an extension of the pipe in which spring ears have been cut is substituted for the footplates.

7,765.—A SIZE: *P. Grosfils.*—The size is intended for use in the preparation of water-colours or distemper, or in painting wall-papers, and in sizing surfaces, it is composed of common starch that has been dissolved in diluted nitric acid; it will then constitute a liquid glue which, it is stated, will remain for a long time in a liquid condition.

7,766.—AN APPLIANCE FOR USE WITH CAGE-LIFTS: *P. F. Cantlion.*—The inventor seeks to furnish means of arresting the cage automatically at the ends of its travel. At those times a projection from the hydraulic cylinder of the piston-rod will engage with either one of two pivoted Y-shaped levers which are joined crosswise with rods whose lengths can be suitably adjusted. To one of the Y-levers a throttle-valve is joined by means of a rod. The valve can be closed by the action of the projecting lug, which rocks the one Y-lever towards the right, and so turns the other Y-lever in the contrary direction.

7,806.—ADJUSTMENT OF WINDOW SASHES: *J. W. Cropper.*—The sashes are attached with sliding bolts to sliding stiles upon one side of the frame, and are hinged on to rebated sliding stiles upon the other side of the frame; the bolts are shot back into sockets in the pulley stile, the sliding stiles being thus kept in their places. When one turns the sashes upon their hinges, and for the turning of the upper sash into the room, the lower sash will enter a recess made in the window-head, which has a ventilation space opening into the air outside, flaps of mica or other material being fitted upon the middle board, which is perforated.

7,815.—APPLIANCES FOR WINDOWS: *R. R. Thom and S. McCall.*—The lower sash is caused to slide in the frame aud turn inwards upon lower pivots, whilst the upper sash is pivoted at the bottom rail within the frame, the sash-cords are secured to the rebated or grooved edges of the lower sash and are thence passed around guide-pulleys or through eyes upon the frame and the upper sash, which can be sustained in any position desired by means of the friction between the cords and the hooks or pulleys. For fastening the sash in a partially-opened position there are sliding bolts within the meeting-rail of the lower sash that will engage with grooves cut in the upper portion of the frame and can be shot into holes in the frame. Provision is made for a removal of the upper sash from the frame by means of pivots upon it, which will slide along transverse grooves in the pulley-stiles and so into vertical grooves cut in the sash.

7,824.—DRAIN-PIPE SOCKETS: *R. Stanley and R. H. Smith.*—For making the socketed ends of drain-pipes and similar plastic goods, the inventors contrive that the two halves of the socket-die of the pipe-making machine shall exert great pressure upon the material. In one form the two halves of the die (into which are screwed hard-metal tips) are set to slide upon parallel guides; the spaces between their ends are filled with wedges which, together with the die-halves, are operated at one and the same time with crank and link gearing, the pressure being exerted by means of blocks which are joined to a four-sided frame that is worked with a screw mechanism. In another shape the half-dies are caused to slide upon metal guides, and their lugs join them to levers that are worked with a hand-wheel, for which, however, other power may be substituted. At the ends of the shaft are right and left handed threads, and hollow blocks, having their inner surfaces rounded, are mounted upon the shaft.

7,833.—TRAVELLING CRANES: *F. W. Tannett-Walker.*—A carriage, on rails, having a horizontal pulley, and a crab, also on rails, traverse the traveller. A rope from the carriage passes around pulleys to the crab, then around the fall-block, and so to the crab again, and thence to a fixed point upon the traveller, whereby the lifting-hook will be lifted and dropped with the movement of the carriage. For working the carriage apart from the position of the traveller, another rope is passed from the fixed hydraulic cylinders round a pulley upon the traveller and so around pulleys upon the carriage and traveller to a fixed point. In a modified form of the apparatus the ends of cross-shafts have pulleys which run upon rails, and pulleys upon the cross-shafts carry the hauling-ropes for the traveller. Each of the shafts is disposed in the bight of the

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rope, the ends of which are secured to the end wall and the traveller respectively, so that it will move at a speed one-half of that of the traveller.

7,845.—AN ODOMETER: *C. Y. Hopkins.*—An annular space for the numbered wheels is bored in the solid metal which forms the core and casing; upon a spindle are transmitting and locking pinions that fit into a recess in the core; the operating star-wheel has a spindle having an eccentrical enlargement which carries two differently pitched and rigidly joined pinions that engage with the teeth of a fixed ring and an outer ring; on the casing is mounted a cylindrical rib adjustably set in an eyed-plate with a fork clamped with a screw pin that engages with a gripping-piece.

7,847.—CONTRIVANCE FOR INCANDESCENT GAS LAMPS: *W. T. Sugg.*—The mantle-rod is truely mounted in a peg of pipeclay, which is cemented in a recessed stump that constitutes the centering; a cap bearing upon the shoulder of the centering-stump may be adopted instead of the peg.

7,851.—WIRING FOR INCANDESCENT ELECTRICAL LAMPS: *O. Riebensahm.*—The neck of the bulb is contracted, and tapered at the end. The bulb is fashioned with a tube that projects inwards, and in the inner end of which the leading-in wires are sealed, one of them being fastened in an insulating-plug, and the other being turned over and coiled upon the contracted part of the neck of the bulb. When the neck has been forced into the cap the tongues of a metal liner will be pressed against the coiled wire. A central contact and a spring that presses upon the other wire are mounted upon the insulating portion of the cap.

7,857.—A STEEL-YARD: *S. R. Fernandez.*—The steel-yard is intended for use with both heavy and light loads, for which the beam is graduated with lower and upper scales respectively. In the case of heavy loads an auxiliary weight is hung from a grooved sliding weight, and for weighing light loads the auxiliary weight is hung from the end of the beam.

7,870.—SIPHONICAL DISCHARGE: *C. Darrah.*—The inventor's object is to furnish means of lessening the noise of the discharge. He supplements the main siphon with a subsidiary one in order that air may gain entrance through an orifice in the leg of the latter siphon, as soon as the level shall have reached it. He also arranges a loosely-fitting float, which will slide over the orifice as it becomes uncovered.

7,904.—BALL-AND-FLOAT VALVES: *F. J. Brazier.*—The invention relates to an automatical valve for use with flushing-tanks, cisterns, &c. A sleeve carried upon connecting pieces is inserted within an extension, downwards, of the valve casing on which are lugs for the pivots of the float-lever that is inserted through a slot in an arm of the plug-valve. On the casing is a rim or seat, turned downwards, against which the valve works, and it also has stops for restricting the movement of the float-lever.

7,911.—A PRESERVATIVE FOR WOOD: *J. Rutgers.*—A solution that will form an emulsion with water, and for which highly penetrating qualities are claimed, consists of tar oil dissolved in acids that have been derived from resin oil after its treatment with concentrated sulphuric acid.

7,925.—PILE-DRIVERS FOR FOUNDATION WORKS: *A. Ducloux.*—A monkey having its end pointed is dropped into the soil, and when the hole has been filled with sand, &c., the process is repeated until the requisite amount of resistance results, then a monkey having a broad and flat end is dropped for rendering the ground smooth; the lifting-chain of the pile-driver is fastened to a pulley that hangs from a spring upon an adjustable carriage and is thence passed over the carriage and another pulley; for an automatical disengagement are devised three gripping-jaws that are pivotted upon spindles between lugs which hang by links and spindles, from the lower part of the hook, the monkey is liberated as it rises through the engagement of the upper parts of the jaws with their guide.

7,945.—CONSTRUCTION OF FLOORS: *A. Gray.*—For their protection against fire, slabs of earthenware, wired terra-cotta, metal lathing, non-inflammable wood, or some other fireproof substances, are fastened in position about the beams, joists, and girders, between the slabs and the beams, or above the covering slabs are affixed centering slabs of concrete, slate, plaster, and so on, which will sustain the concrete or similar pugging that has been filled in. The fire-proof slabs may be affixed with hanging wires and tubes, the latter being available for carrying gas pipes and electrical wires.

8,040.—TRESTLES, &c., FOR STAGING FOR USE BY PAINTERS, PLASTERERS, AND BUILDERS GENERALLY: *H. J. Williams and A. H. Williams.*—These are made up with bars and struts joined together with stays or tie-rods, hinge-plates, and bolts. Provision is made for their vertical adjustment by making several bolt-holes in each bar, and to the bars are attached stepped blocks that will carry a round put-log or pole, or a horizontal plank laid upon its edge. For the stepped blocks may be substituted slotted metal plates bolted on to the bars and rendered adjustable sideways. The struts are after the telescopical kind, the flooring-boards are to be laid either upon put-logs laid on the trestles or planks, or upon the planks laid on their edges.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 13.—By ALFRED J. BURROWS (at Ashford).

Little Chart, Kent.—Monday Boys, Rose and Crown b.-h., f. £1,200
Ashford, Kent.—Bank-st., Ashford Post Office, u.t. 67 yrs., g.r. 9*l.*, r. 120*l.* 1,300
August 14.—By WRIGHT & SCRUBY (at March).
Wimblington, Cambs.—The Park and 25 a. 2 r. 10 p., f. 2,300
Enclosures of pasture and arable land, 128 a. 1 r. 8 p., f. 3,705
Two cottages and 1 a. 2 r. 12 p., f. 280
High-rd., The Manor House and 3 a. 2 r. 6 p., f. 490
Two enclosures of pasture land, 10 a. 3 r. 30 p., f. 245
The Home or Nix Hall Farm and enclosures, 158 a. 2 r. 38 p., f. and c. 5,495
August 15.—By WYATT & SON (at Selsey).
Selsey, Sussex.—West-st., freehold field, 2 a. 0 r. 26 p. 310
By W. H. SHINER & WINTER (at Bristol).
Wick St. Lawrence, Somerset.—Sluice Farm, 84 a., f. 4,975
August 16.—By WILLSON & PHILLIPS (at Leigh).
Leigh, Essex.—New-rd., seventeen cottages, f., r. 151*l.* 8s. 1,340
New-rd., f.g.r. 12*l.*, reversion in 59 yrs. 405
August 19.—By THOMAS, PEYER, & MILES.
Bramley, Surrey.—High-st., The Bramley Brewery, together with eight licensed houses and goodwill, f. and l. 16,250
By WRIFORD & DIXONS.
Maida Vale.—9, Clifton-villas, u.t. 40½ yrs., g.r. 6*l.*, e.r. 85*l.* 675
By WHEELER & SON (at Clare).
Pentlow, Essex.—Pannell's Ash and Simpson's Farms, 229 a. 2 r. 30 p., f. 2,540
August 20.—By HENRY EDWARDS (Imperial Land Company).
Kentish Town.—17, Mansfield-rd., u.t. 48 yrs., g.r. 6*l.* 10s., e.r. 55*l.* 670
By C. & H. WHITE.
Kennington.—17, Harleyford-st., u.t. 35 yrs., g.r. 5*l.*, r. 50*l.* 400
By T. NEALE & SON (at Nottingham).
Beeston, Notts.—Meadow-rd., Clifton House and piece of land adjoining, f. 1,650
By ALFRED PRESTON (at Ipswich).
Battisford, Suffolk.—The Valley Farm, 93 a. 3r. 23 p., f. and c. 700
By JOHN THORNBOROW (at Penrith).
Kirkoswald, Cumberland.—Parkhead Farm, 90 a. 2 r. 31 p., f. and c. 1,740
August 21.—By SLADE & BUTLER.
Battersea.—9 and 11, Orbel-st., u.t. 76 yrs., g.r. 12*l.* 12s., r. 78*l.* 600
August 22.—By ELDRIDGE, SONS, & CO.
Stroud Green.—6, Ferme Park-rd., u.t. 77 yrs., g.r. 14*l.*, r. 80*l.* 1,000
By FISHER, STANHOPE, & DRAKE.
Stoke Newington.—25, Forburg-rd., u.t. 85 yrs., g.r. 6*l.* 10s., e.r. 45*l.* 525
Finsbury Park.—442, Seven Sisters'-rd., u.t. 64 yrs., g.r. 14*l.*, e.r. 80*l.* 1,000
By WM. R. NICHOLAS & CO.
Cholsey, Berks.—Freehold residence and 3 a. 2 r. 9 p. 1,150
By NEWBON, EDWARDS, & SHEPHARD.
Islington.—75, 79, and 81, Pembroke-st., u.t. 48 yrs., g.r. 3*l.*, r. 145*l.* 1,020
Canonbury.—83, Petherton-rd., u.t. 48 yrs., g.r. 7*l.* 7s., e.r. 60*l.* 500
Harlesden.—47, Craven Park-rd., f., r. 45*l.* 565
Kentish Town.—10, Modbury-st., u.t. 48 yrs., g.r. 6*l.*, e.r. 34*l.* 255
Tottenham.—2 and 4, The Crescent, f., r. 48*l.* 2s. 480
10A, Brunswick-rd., f., r. 36*l.* 8s. 325
6, Highweek-rd., u.t. 78 yrs., g.r. 4*l.* 10s. 170
29 and 30, Nelson-rd., u.t. 78 yrs., g.r. 8*l.* 255
49 and 51, Avenue-rd., u.t. 65 yrs., g.r. 8*l.* 295
56, Avenue-rd., u.t. 76 yrs., g.r. 7*l.* 10s. 210
9 and 11, Richmond-rd., u.t. 73 yrs., g.r. 8*l.* 350
54 to 60 (even), Asplin's-rd., u.t. 78 yrs., g.r. 22*l.* 590
147, Northumberland Park, u.t. 50 yrs., g.r. 4*l.* 10s. 225
Edmonton.—53 to 59 (odd), Graham-rd., u.t. 78 yrs., g.r. 16*l.* 300
August 23.—By THE FREEHOLD LAND AND TRADING COMPANY, LIMITED.
Hanwell.—8, 9, 11, 12, 13, and 14, Holly Park-terrace, u.t. 95 yrs., g.r. 30*l.*, r. 174*l.* 1,845

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 14 0	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 11 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 8 0	" " "
Flettons	1 8 6	" at railway depôt.
Red Wire Cuts	1 14 6	" " "
Best Fareham Red	3 11 0	" " "
Best Red pressed Ruabon Facing.	5 5 0	" " "
Best Blue Pressed Staffordshire	4 4 6	" " "
Do., Bullnose	4 9 0	" " "
Best Stourbridge Fire Bricks	4 8 6	" " "

PRICES CURRENT (*Continued*).

	£ s. d.	
GLAZED BRICKS		
Best Whits and Ivory Glazed Stretchers	13 0 0	per 1,000 at railway depot.
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
plays, Chamfered, Squints	14 0 0	" " "
Seconds Quality White and Dipped Salt Glazed	2 0 0	" less than best.
	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	34 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath "	1 7	" "
Farleigh Down Bath	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks	2 1½	" "
Red Corsehill "	2 5	" "
Red Mansfield "	2 4½	" "
Hard York in blocks	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt
" " 6 in. Rubbed Ditto	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" " 2 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt
" " " 6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
" " " 3-in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep.
" best seconds "	10 15 0	" "
16× 8 best "	6 2 6	" "
20×10 best blue Portmadoc	10 18 0	" "
16× 8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green	11 2 6	" "
16× 8 " "	6 15 0	" "
20×10 Permanent green	10 0 0	" "
16× 8 " "	5 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	48 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. ornamental Do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" " "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards—		
1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.
¾ in.	1 0 0	more than battens.
Fir timber: Best middling Dansig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10

[See also next page.

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Paving Works, &c., Church-street	Uckfield (Sussex) U.D.C.	C. Dawson, Public Hall Chambers, Uckfield	Sept. 3
Sewerage Works, &c., Pembury	Tonbridge (Kent) R.D.C.	W. V. Graham, Civil Engineer, 5, Queen Anne's Gate, S.W.	do.
Fifteen Houses, Almondbury, Yorks	.....	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Cast-iron Pipes, &c., Lavernock	Llandaff & Dinas Powis R.D.C.	J. Holden, Surveyor, 35, St. Mary-street, Cardiff	do.
Concrete Walling, &c., Andrew's-road	Hackney Borough Council	N. Scorgie, Civil Engineer, Town Hall, Hackney, N.E.	do.
House, Caeran, Cardiff	Col. Sir E. S. Hill	J. W. Rodger, Architect, 14, High-street, Cardiff	do.
Buildings at School of Art, Leeds	Committee	Bedford & Kitson, Architects, Greek-street Chambers, Leeds	do.
Additions, &c., to Cottages, Talywain	.....	J. D. Jones, 1, Emlyn-terrace, Talywain, Wales	do.
Several Cottages, Troedyrhiw, Wales	Brynhyfryd Building Club	W. Dowdeswell, Architect, Treharris, S. Wales	do.
Additions to Church, Linthwaite, near Huddersfield	.....	Boreham & Morton, Surveyors, 24, John-street, Sunderland	Sept. 4
Additions to Workhouse	Toxteth Park (Liverpool) Gdns.	W. W. Thomas, Architect, 15, Lord-street, Liverpool	do.
Council Offices, Liverpool-road	Walmer U.D.C.	R. A. Wilson, Surveyor, Council Offices, Walmer	do.
Tar Paving, &c., Chapman-road	Clacton-on-Sea U.D.C.	A. R. Robinson, Surveyor, Clacton	do.
Chapel, Blaengarw, Glam.	.....	Dr. J. L. Thomas, Blaengarw	do.
Intake Works, Carbis	St. Austell R.D.C.	T. H. Andrew, Engineer, 1, Trevarrick-villas, St. Austell	do.
House, Wellesley-road, Great Yarmouth	Mr. H. R. Atkins	C. G. Baker, Architect, Town Hall Chambers, Great Yarmouth	do.
Retort Works, &c.	Ellesmere (Salop) U.D.C.	R. E. Lloyd, 1, Willow-street, Ellesmere	do.
Additions to Home, Murthly Asylum	.....	D. Smart, Architect, Perth	Sept. 5
Additions to Houses, Ingleton	Mr. N. Saul	J. Kassell, Architect, Kirkby Lonsdale	do.
Wood Paving	Chatham Corporation	C. Day, Borough Surveyor, Town Hall, Chatham	do.
Additions to the Shepherds' Arms, Cwmaman	Mr. E. Evans Bevan	J. C. Rees, Architect, Neath	do.
Boundary Walls, &c., Brownhill, Dewsbury	.....	Holtom & Fox, Architects, Dewsbury	Sept. 6
Additions to Infirmary, Bristol	.....	A. P. T. Cotterell, Architect, 23, Baldwin-street, Bristol	do.
House, Moat-road, Great Yarmouth	.....	S. Rivett, Architect, 5, South Quay, Great Yarmouth	do.
Seven Houses, Old Penshaw, Durham	Mr. R. W. Wilson	Mr. Wilson, Shiney-row, Old Penshaw, Durham	do.
Alterations to Laundry, &c., Preston	.....	F. E. Dixon, Civil Engineer, 49, Lune-street, Preston	Sept. 7
Slaughter Houses, &c., Bath-street	Rugby U.D.C.	D. G. Macdonald, Civil Engineer, Rugby	do.
Rebuilding Cashen Ferry Bridge, Tralee	.....	S. Goodwin, Surveyor, Tralee, co. Kerry	do.
School and Boundary Wall, Banbridge, Ireland	Select Vestry	T. Larmour, Dromore-street, Banbridge	do.
Schools, Windsor-road, Great Harwood, Lancs	.....	W. H. Dinsley, Architect, Cleveland-street, Chorley	do.
Additions to the Panteg Hotel, Aber, Wales	.....	A. O. Evans, Architect, Pontypridd	do.
Well Adit	Beaminster R.D.C.	H. Gordon, Engineer, 9, Downes-street, Bridport, Dorset	Sep. 9
Chapel	Southborough, Kent, U.D.C.	W. Harmer, Surveyor, 137, London-road, Southborough	do.
Sea Wall	Penmaenmawr (N. Wales) U.D.C	E. Worrall, Engineer, Council Offices, Penmaenmawr	do.
Road Works, &c., Dale-road	Rawmarsh U.D.C.	Surveyor, Council Offices, Rawmarsh	do.
Pumping Machinery	Cowes U.D.C.	J. W. Webster, Engineer, Cowes, Isle of Wight	do.
Additions to Wesleyan Chapel, Cwmavon	.....	G. E. Prosser, Cwmavon	do.
Baths	Aberdare U.D.C.	T. Phillips, Surveyor, Town Hall, Aberdare	do.
Wrought-iron Fencing	do.	do.	do.
Retaining Walls, &c., Clayton Vale	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
*Stoneware Pipes	Edmonton U.D.C.	G. Eedes Eachus, Town Hall, Edmonton	Sept. 10
*Portland Cement	do.	do.	do.
*Broken Granite	do.	do.	do.
Abattoirs	Lincoln Corporation	R. A. Macbrair, Surveyor, Corporation Offices, Lincoln	do.
Two Bridges, Briton Ferry, &c.	Great Western Railway Company	G. K. Mills, Paddington Station, W.	do.
Bridge Works, Oxcliffe Marsh, Lancs	Lancashire County Council	Lancashire County, Bridgemaster, Preston	do.
Bridge Works, Alverston	do.	do.	do.
Rebuilding Holt Bridge, Rawtenstall	do.	Bridgemaster, County Offices, Preston	do.
*Wrought-iron Fencing, &c.	Woolwich Union	Church, Quick, & Whincop, William-street, Woolwich	Sept. 11
*Drainage and Sanitary Works, Brentwood Schools	Hackney Union	W. A. Finch, Architect, 76, Finsbury-pavement, E.C.	do.
*Well-sinking Works, Quadrant, Pumps, &c.	Croydon County Borough	Borough Engineer, Town Hall, Croydon	do.
*Enlargement of Iron Building	Plumstead Congregational Church	Viewland-road, Riverdale-road, E. Plumstead	do.
*Erection of Shed	Lewisham Council	Surveyor, Town Hall, Catford	Sept. 12
*Erection of Cottage	do.	do.	do.
*Construction of Sewer	do.	do	do.
*Extensions, &c., to Asylum, Aylesbury	Bucks County Lunatic Asylum	County Surveyor, County Hall, Aylesbury	do.
Water Supply Works	Llandudno U.D.C.	E. P. Stephenson, Engineer, Council Offices, Llandudno	Sept. 14
*Road Works	Hanwell U.D.C.	S. W. Barnes, Council Offices, Church-road West, Hanwell W.	Sept. 16
*Laundry, Boiler House, E. L. Engine Room, &c.	West Riding County Council	The County Surveyor, Wakefield	do.
*New Harbour Offices	Swansea Harbour Trust	Harbour Offices, Swansea	Sept. 18
*Casual Wards, Gray's Inn-road	Holborn Union	W. Mellor, 17, Buckingham-street, Adelphi, W.C.	do.
Schools, Burry Port, Wales	Pembrey School Board	R. Williams, Architect, Burry Port	Sept. 26
*Isolation Hospital	Longton Corporation	Town Clerk, Court House, Longton	No date
Laundry, Witton Tower, Witton-le-Wear, co. Durham	.....	S. Wilkinson, Architect, Pelton, Chester-le-Street.	do.
Stabling, &c., Dorning-street, Wigan	Co-operative Society	J. B. & W. Thornley, Architects, Millgate, Wigan	do.
Farmhouse, Usworth, co. Durham	Mr. R. D. Shafto	S. Wilkinson, Architect, Pelton, Chester-le-Street	do.
Additions to Schools, Trefonen, near Oswestry	.....	F. H. Shaylar, Architect, 19, Church-street, Oswestry	do.
Eight Shops, Willesden	.....	J. Minnis, 25, Lonsdale-road, Barnes	do.
Cottage, Buxton	Mrs. Irvine	Garlick & Flint, Architects, Buxton	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Examiner in Patent Office	Civil Service Commission	Not stated	Sept. 19
*Clerk of Works	Carlisle, &c., Co-op. Society, Ltd.	Not stated	Sept. 21
*Clerk of Works	Midland Counties Idiot Asylum	Not stated	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. —.* *Contracts, pp. iv. vi. viii. x. & xxi.* *Public Appointments, pp. xix. & xxi.*

PRICES CURRENT (*Continued*).

WOOD.

Joiners' Wood.	At per standard. £ s. d.	£ s. d.
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0

PRICES CURRENT (*Continued*).

WOOD.

Joiners' Wood.	At per standard. £ s. d.	£ s. d.
Petersburg: second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0

PRICES CURRENT (*Continued*).

WOOD.

Joiners' Wood.	At per standard. £ s. d.	£ s. d.
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -

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PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders „ „	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
Iron.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
„ „ galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
„ „ to 24 g.	11 0 0	- - -
„ „ to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
„ „ 22 g. and 24 g.	13 0 0	- - -
„ „ 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
„ „ 22 g. and 24 g.	17 0 0	- - -
„ „ 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
„ „ 22 g. and 24 g.	13 0 0	- - -
„ „ 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
„ „ 22 g. and 24 g.	13 5 0	- - -
„ „ 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
Lead—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 17 6	- - -
Zinc—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
Copper—		
Strong Sheet per lb.	0 1 0½	- - -
Thin „	0 1 2	- - -
Copper nails „	0 1 2	- - -
Brass—		
Strong Sheet „	0 0 11	- - -
Thin „	0 1 1	- - -
Tin—English Ingots „	0 1 4½	- - -
Solder—Plumbers' „	0 0 7	- - -
Tinmen's „	0 0 8	- - -
Blowpipe „	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 0	per ton delivered.
Fine „	39 0	„ „
Coarse Keenes and Parian cement	55 0	„ „
Fine do. do.	60 0	„ „
Robinson's Fireproof Cement	50 0	„ „
Do. Fine white „	55 0	„ „
(Exclusive of the ordinary charge for sacks.)		
Whiting	27 0 to 30 0	„ „

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d. per ft. delivered.
„ „ fourths	2½d. „ „
21 oz. thirds	3½d. „ „
„ „ fourths	3½d. „ „
26 oz. thirds	5d. „ „
„ „ fourths	4½d. „ „
32 oz. thirds	6d. „ „
„ „ fourths	5½d. „ „
Fluted sheet, 25 oz.	3½d. „ „
„ „ 21 „	4½d. „ „
Hartley's Rolled Plate	3d. „ „
⅛ „ „ „	3½d. „ „
⅛ „ „ „	4d. „ „

PRICES CURRENT (*Continued*).

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 10
„ „ „ in barrels „	0 2 11
„ „ „ in drums „	0 3 1
Boiled „ „ in pipes „	0 3 0
„ „ „ in barrels „	0 3 1
„ „ „ in drums „	0 3 3
Turpentine, in barrels „	0 2 3
„ in drums „	0 2 5
Genuine Ground English White Lead per ton	22 0 0
Red Lead, Dry „	22 10 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. S. & Sons (Amounts should have been stated).

A. R. B. (As you do not send your name, we are not able to print your communication).

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERDEEN.—For the construction of outfall sewerage works, for the Town Council. Mr. W. Dyack, C.E., Town House, Aberdeen:—

Peter Tawse, Portland-street, Aberdeen* £54,949 8 2

ASTON ABBOTTS (Bucks).—For the erection of a pair of cottages, for Mr. Edward Hart. Mr. Fred Taylor, architect, Aylesbury:—

Thos. J. N. Cannon £509

AXMINSTER.—Lower Westwater farm buildings, for Mr. J. Dominett. Mr. Ernest A. Pryer, architect and quantity surveyor:—

Ellis & Sons	£575	Parsons & Clarke	£479
G. H. Lentell	487		

AXMINSTER.—Middle Westwater residence, for Dr. Dunstan, of London. Mr. Ernest A. Pryer, architect and quantity surveyor, Dunheved Chambers, Axminster:—

C. Turner	£1,400	Ellis & Sons	£1,080
Hobbs & Son	1,338	G. H. Lentell	1,073
Clarke & Parsons	1,246		

AYLESBURY.—For the erection of a detached residence in the Wendover-road, for Mr. J. Kingham. Mr. Fred Taylor, architect, Aylesbury:—

Webster & Cannon	£820	J. Holland	£811
Green & Co.	820	Mayne & Son†	780

BRILL.—For additions to the National Schools at Oakley, for the Brill School Managers. Mr. Fred. Taylor, architect, Aylesbury:—

J. Holland £227

CHEARSLEY (Bucks).—For additions to house at Chearsley, for Mr. F. T. Higgins Bernard. Mr. Fred. Taylor, architect, Aylesbury. Quantities by the architect:—

T. H. Kingerlee & Sons	£2,027	Webster & Cannon	£1,725
G. H. Gibson	1,850	Green & Co.*	1,642

CROYDON.—Two shop premises at corner of Tamworth-place, Church-street, Croydon. Mr. A. Broad, architect, 22, George-street, Croydon. Quantities by the architect:—

Huntley Bros.	£2,710	D. W. Barker	£2,168
S. Page	2,664	Smith & Son	2,158
Akers & Co.	2,375	E. J. Saunders	2,140
Smith & Sons	2,200	Pearson & Co.*	1,850
W. Potter	2,180		

CROYDON.—Four cottages, Newark-road. Mr. A. Broad, architect, 22, George-street, Croydon:—

J. J. Cooper	£1,765	W. Potter*	£1,300
Pearson & Co.	1,437		

GREENOCK.—For the extension of the engine-room at electricity station, Hunter-street, for the Police Board. Mr. W. M. Nelson, Burgh Engineer, Hunter-place, Greenock:—

Aitkenhead & Sons, Greenock* £1,175 18 10

HARROGATE.—For the erection of a police convalescent home. Messrs. Chorley, Connon, & Chorley, architects, 15, Park-row, Leeds:—

Anthony Lyons	£8,827	J. T. Wright	£8,150
Wm. Nicholson & Sons	8,175	R. Airton, Harrogate*	7,600

HEREFORD.—For the erection of six cottages at Asylum, Burghill, for the Visitors. Mr. A. Dryland, County Surveyor, Shire Hall, Hereford. Quantities by the architect:—

Lewis & Co.	£2,415	J. Davies	£2,276
Wm. Powell	2,375	E. W. Wilks*	2,116
C. Cooke	2,300		

[All of Hereford.]

LONDON.—For alterations and additions at No. 101, Great Titchfield-street, W., for Mr. William Matthews. Messrs. H. Fuller Clark & Percy A. Boulting, architects, 28, John-street, Bedford-row, W.C.:—

Patman & Fotheringham	£3,700	Saunders & Co.	£2,380
Clarke & Mannoch	2,497	A. A. Webber	2,333
J. Hughes	2,408	Burman & Sons	2,064
Perkins & Co.	2,395	Anley & Son	1,920
		Pitcher & Son*	1,904

LONDON.—For alterations at No. 66, Berners-street, W. Messrs. H. Fuller Clark & Percy A. Boulting, architects, 28, John-street, Bedford-row, W.C.:—

Bruton & Son	£445	Anley & Son	£310
Boulting & Sons	390	Pitcher & Son	294

LONDON.—For re-pointing, painting, and general repairs to 101 and 102, Chalton-street, for Messrs. Connolly Bros. Mr. Edwin G. Salter, architect and surveyor, 13, Phœnix-street, St. Pancras, N.W.:—

T. G. Sharpington	£520	W. J. Clarke	£423
Marchant & Hirst	493	Vears & Co.	419
Fowler Bros.	487	Wm. Hunnings, Holloway*	415
H. M. Dove	450		

LONDON.—For office fittings, &c., at 19, Cousin-lane, Cannon-street, E.C., for the Ceylon, India, and China Tea Association. Mr. Chas. G. Miller, architect, 65, Chancery-lane, W.C.:—

A. & A. Webber	£634	Parker	£540
Richards & Co.	596	Parnall & Co., Ltd., Rood-lane*	530
Sheffield	573		

LONDON.—For painting, whitewashing, and repairs, &c., at the workhouse and infirmary, Fulham Palace-road, Hammersmith, W., for the Guardians of the Poor of Fulham Parish:—

J. Halse	£1,645	J. J. Richards	£792
W. J. Renshaw	1,497	G. McArthur, Fulham*	760
T. Bendon	1,050	E. Mills	743
Vigor & Co.	860		

LONDON.—For alterations and additions to the work house, Fulham Palace-road, Hammersmith, W., for the Guardians of the Poor of Fulham parish:—

H. C. Clifton	£4,210	T. Bendon, Hammersmith*	£2,522
Martin, Wells, & Co.	3,694		
F. G. Minter	3,041		

LONDON.—For the erection of cottage homes for the aged poor, at Tooting Home, Church-lane, Tooting, for Wandsworth and Clapham Guardians. Mr. Cecil A. Sharp, architect, 11, Old Queen-street, Queen Anne's-gate, S.W.:—

Herbert Bros.	£4,437	Smith & Son	£3,950
Harvey, Coney, & Co.	4,329	Hobbs & Co.	3,888
R. A. Jewell	4,212	Canning & Mullins	3,800
Martin, Wells, & Co.	4,197	H. Clark	3,782
W. Dowland	4,148	Huntley Bros., Croydon*	3,629
Foster Bros.	4,039		

NEWTON ABBOT.—For the erection and completion of isolation hospital for the joint committee. Mr. Wm. Rowell, architect, Newton Abbot. Quantities by Mr. Vincent Cattermole Brown, Paignton:—

W. E. Blake	£7,324	Parker Bros.	£5,894
Mingo & Boone	6,785	H. Mills	5 589
F. A. Stacey	6,557	I. Edwards, Newton Abbot†	5,225
Yeo & Sons	6,000		
G. Hicks	5,998		

NORTON (Yorkshire).—For the erection of semi-detached villas, Langton-road, for Mr. T. Lofthouse. Mr. H. Ascough Chapman, architect, Leeds and Scarborough:—

Anthony Lyons £1,828 10

NORTON (Yorkshire).—For the erection of a detached house, St. Peter's-street and Langton-road. Mr. H. Ascough Chapman, architect, Leeds and Scarborough:—

Anthony Lyons £1,312

ORPINGTON (Kent).—For additions and alterations to a private residence at Orpington. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington:—

Stebbings & Pannett	£258	E. R. Thorne	£240
Somerford & Son	244	W. Owen*	240

[*See also next page.*

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ORPINGTON (Kent).—For repairs to private residence. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C. :—

W. R. Taylor	£267	Somerford & Son*	£159
R. A. Lowe	225		

PEMBROKE DOCK.—For the erection of two-storied schools, Meyrick-street, for the School Board. Messrs. G. Morgan & Son, architects, 24, King-street, Carmarthen :—

Thomas & Son	£10,552	Charles Young, Pembroke Dock*	£8,727
Davies & Morgan	9,703		
Davies & Griffiths	9,281		

REDRUTH.—For the erection of offices and stores, for Messrs. S. & T. Trounson. Mr. Sampson Hill, architect, Green-lane, Redruth :—

T. Martin and S. Head, Redruth* £1,655

REIGATE.—For the erection of an addition to Eastnor Lodge, Reigate, for Mr. Edgar Sharpe. Mr. C. E. Salmon, architect, Bell-street, Reigate :—

R. Killick	£1,140	Bagaley & Sons	£798
Nightingale & Sons	878	G. Martin, Redhill*	730

Plumbing.

Tamplin & Makooskis, Limited* £77 19 6

ST. MARY CRAY (Kent).—For a new iron schoolroom at Hockenden. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C. :—

	For the iron building.	For foundations and general work.
R. A. Lowe	£450	£619
Somerford & Son	—	556
Stebbings & Pannett	—	355
Humphreys, Ltd.	310	—
W. Harbrow	303	—
Smith & Co.	298	—

ST. PAUL'S CRAY (Kent).—For additions to private residence. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington :—

James Smith	£203	G. H. Lay	£180
E. R. Thorne	185	T. Knight	138
T. D. Gratz	135	Stebbings & Pannett*	137

ST. PAUL'S CRAY (Kent).—For additions and alterations to the Cray Valley Cottage Hospital. Mr. St Pierre Harris, architect, Ironmonger-lane, E.C., and Orpington. Quantities by Messrs. Stanger & Son :—

G. Newton	£2,843	Somerford & Son	£2,649
Rider & Son	2,810	T. Knight	2,631
Stebbings & Pannett	2,805	T. D. Graty	2,537
Garrett & Son	2,749		

SOUTHALL.—For the erection of new factory for Messrs. Sanders & Son, Limited. Mr. Chas. G. Miller, architect, Southall and 65, Chancery-lane, W.C. :—

Richards & Co.* £3,995

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The Builder.

VOL. LXXXI.—No. 3057. SEPTEMBER 7, 1901.

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"Tigbourne Court," near Godalming.—Mr. E. L. Lutyens, Architect ..... *Single-Page Tone-Block.*
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The "Colonne Soriane," St. Mark's, Venice.

CLOSE against the southern flank of St. Mark's church, just where the great fifteenth century gateway of the Ducal Palace leads to the "Giant's Staircase," within the courtyard stand two singular-looking square monolithic piers of hard limestone, each covered on three sides with elaborate oriental carving—carving unlike any to be elsewhere found in Venice—reminding one of Persian tiles or Eastern carpets, and yet with a certain special character of its own which distinguishes it from the genuine Byzantine and Classical fragments of sculpture built up in the walls of the adjoining basilica. These two columns have, in addition to their flowery Eastern carving, two very curious circular panels on each of their outer sides or fronts, filled in with singularly puzzling monograms which have hitherto remained unexplained. The chronicles and old guide books of Venice are almost silent as to their history. Sansorina in his "Citta Nobilissima" (1570), for instance, merely describes them as the Syrian columns brought from Acre by the Crusaders, and having inscriptions in the "Syrian language." All that we can discover about them is that they were transported from Acre to Venice in the middle of the thirteenth century, at the time of the great double victory won by the Venetians over the Genoese in the waters of Tyre and Acre; and we may, perhaps, conclude that their presence on the Piazzetta has some reference to this event, but there is no historical evidence to prove such to have been the case. On the contrary, they may have been brought over merely as ballast to some returning empty galley, in the way in which so many of the artistic treasures robbed from the Levantine sites were procured for the decoration of the Patria. The two columns seem to have been set up in the Piazzetta with the intention of forming an important arched entrance to the baptistry of the basilica. To the ancient capitals an abacus of ordinary Venetian type of carving was added to receive whatever superstructure may have been originally intended—something, perhaps, resembling the curious elongations of the great west front of the basilica. But whatever was the intention of the builders in the thirteenth century, no trace of any such design now remains, owing to the manner in which the outside of St. Mark's has been rebuilt and restored time after time. The large crosses in flat relief on the lower portions of the columns seem to belong to their thirteenth century adaptation by the Venetians. On the inside of the columns are rebates or grooves for the gates or doors, but no trace of hinges remains. We must, therefore, conclude that such gates or doors were designed to work on pivots at top and bottom in the oriental manner.

The interest attaching to these columns is not so much in their present position, or their adoption by the thirteenth century Venetians as part of the external decorations of St. Mark's, as in their origin and the associations with a little-known type of art which they represent. We know that they were brought over from Acre in the middle of the thirteenth century, but what position they may have occupied in that famous city it is now quite impossible to determine. They are monoliths on so large a scale, that one is tempted to conceive them the decorations of an important city gate, more especially if the interpretations of the monogram inscriptions should prove correct.

Acre, the scene of so many thrilling and important episodes all through the two centuries of the Latin Kingdom's existence, has in modern days shrunk to about one-third of its former extent. In the early Middle Ages it was certainly the most important political and commercial centre of that wonderful borderland between European civilisation and Eastern tyranny, if not barbarism, constituted by the Latin principalities of the Levant, which in modern language would perhaps be dignified by the title of a "buffer-state." Absolutely nothing of any importance remains in modern Acre of so remote a date as the thirteenth century, and therefore it is perhaps almost useless to speculate upon the original position occupied by these columns at that time. Acre was divided up into "bici" or quarters belonging to the various nations and races constituting its citizens, and it would appear from such mediæval plans of the city as we possess that the Venetian quarter of the city was intimately associated with the port. If the columns of the Piazzetta once formed, as they seem to have done, an ancient gate of Ptolemaic Akka, we may perhaps be allowed to imagine it the port or water-gate of the city, which would afterwards come within the more immediate control of the Venetians. But such a supposition entirely depends upon the interpretation of the monogram inscriptions in the four circular panels on their fronts. The identification of these inscriptions with any known Levantine alphabet is due to one of the professors in the American College at Beirut, who suggests that they are in the Nabatean or earliest Cufic of the period beginning with the Christian Era. This gentleman ingeniously reads inscription No. 1 as a monogram of the name of Acre in its more primitive form of Akka or Aco, by taking the diamond-shaped letter or symbol in the centre of the monogram as the initial vowel, then the K or Arabic Kaf on the right, and the terminal vowel on the left resembling a Greek E reversed to form the complete word. This theory, is not, however, completely conclusive, and demands verification by a specialist in Cufic, who would also perhaps be able to read inscription No. 2.

However these inscriptions may be translated or the alphabets to which they belong may be identified, these two columns represent a type of art in their sculpture which has received but little study, and they are probably the only examples to be found in Europe on so large a scale. The sculpture (see plate in this issue) is precisely that of all the curious monuments which are neither distinctively Roman, Greek, or mediæval, in that long tract of country stretching between the Gulf of Akaba and the Upper Euphrates

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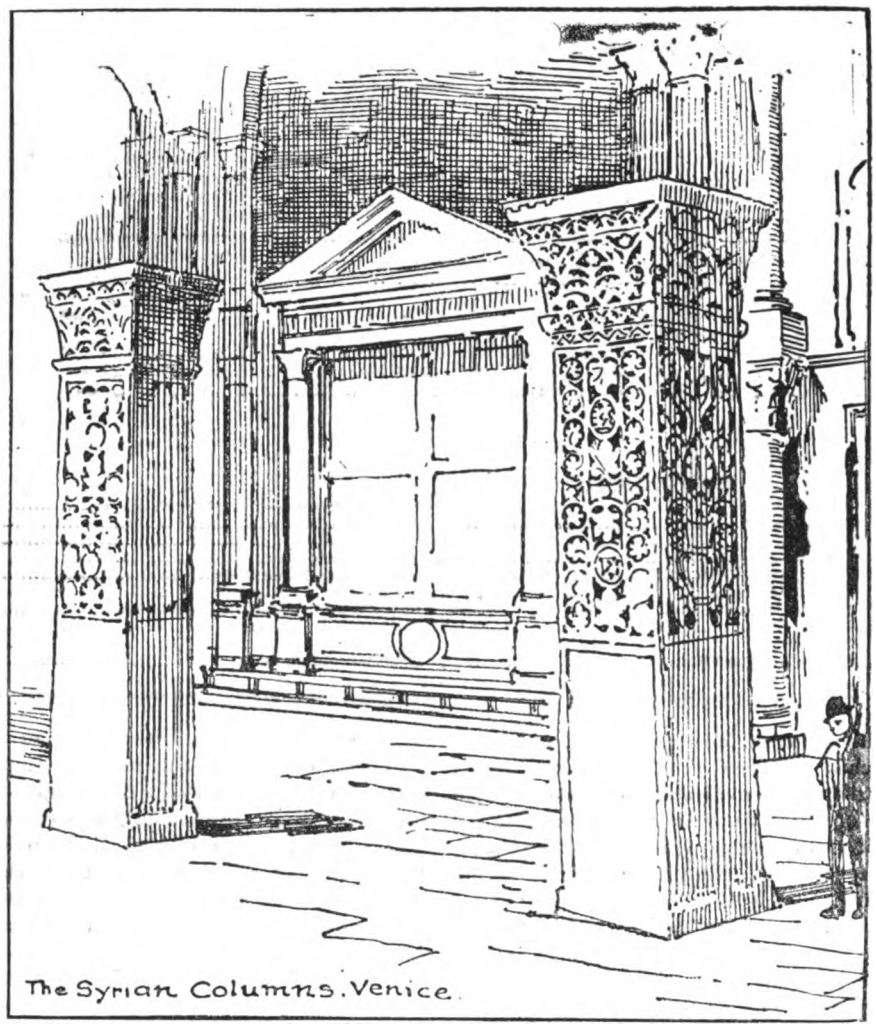

The Syrian Columns. Venice.

In other words, they represent "Semitic" art in as far as such a thing can be said to exist. The Holy Land of Palestine, Syria, and the Sinaitic and trans-Jordanic regions have always been occupied to some extent by Semitic nations, although, owing to an inherent nomadic character, the race has often dwindled under the intrusive influence of European colonisation in Roman and mediæval times. The ancient Jews, during their five hundred years' occupation of the country, seem not to have created one solitary surviving monument which can with any certainty be attributed to them; and their congeners, the Arabs of more modern times, cannot be credited with any artistic inventiveness or genius. The Saracenic splendours of Cairo owe their origin to Coptic workmen (see the researches of M. Gayet, the French archæologist), and the decorative details of Damascus are but a mingling of Persian and Byzantine elements. Between the remote history of the ancient Jews, with their absolute deficiency in artistic expression, and that of the modern Arabs, intervenes an interesting period during which a genuinely Arab race or tribe, the Nabatean, was induced to abandon the nomad life, and under the influence of Romano-Greek civilisation, to develop the remarkable "style" of art of the monuments of Petra. This chapter of history is usually dated from about the third century B.C. until the crushing of this almost independent nationality by the Emperor Trajan in A.D. 105, when its capital Petra was abandoned. The strange and imposing creations of these rock-hewing Semites, which remind one more of the Renaissance vagaries of Dresden or the Jesuit style of the sixteenth century than of any contemporary Classic work, from which they are nevertheless copied, naturally ceased with the national life; but the style continued to survive to some extent long after, independently of the Byzantine and Persian influences fated to supersede it. The supposed Jewish synagogues of very uncertain date, whose ruins are scattered over central Syria, exhibit sculpture which belongs to this primitive Semitic attempt to erect buildings and monuments of an architectural character in rivalry with the flourishing cities of the Decapolis and the Roman Empire. All through the history of the Semitic world the same peculiarity of development presents itself. The Arab and Jew are incapable of invention, but their copies and adaptations of the arts of Aryan nations are always tinged with a certain special character.

In the case of the Jew, almost all efforts at artistic display betray the taste for what is second-hand, which is simply proverbial of the race. The Arab, actuated by a greater desire for luxury than the Jew, adopts the decorations of civilised life, but applies them in a way which adds to their richness of effect regardless of propriety in application, and sometimes produces a result almost equivalent to originality. In the later days of the Middle Ages the Arabs of the Holy Land and Egypt received a remarkable impetus from the Gothic style of the twelfth and thirteenth centuries imported by the Crusaders. The luxurious homes of the Frankish lords of Kerale, Acca, or Edessa were designed by their European owners, but the building and furnishing of them seem to have been the work of native hands, and this interpretation of European inventions by the uninventive Asiatic, to meet the demands of a different climate and mode of life and an extravagant luxury, produced the "Saracenic" style of the twelfth to sixteenth centuries. Since that period very little European influence has been brought to bear on the Levant in a way which would give any artistic development, and, as a consequence, the *motifs* for decoration and architecture left behind by the last Crusaders still survive, and the modern traveller is astonished to see a degenerate pointed arch style adopted as a rule for modern houses and mosques, which frequently look as if they might have been built in the thirteenth instead of the nineteenth century.

In a precisely similar way the Arab and other Semitic races of the Levant carried on the traditions of the Romano-Greek styles, which they had first learnt to copy in the palmy days of Petra, long after the decay of the Roman Empire, and until the great revolution of 1099 introduced a total change of ideas. The monuments of the Holy Land may consequently be divided into two very clearly-defined sections by this date of 1099. After that date everything with any artistic pretensions is in the Gothic style of early mediæval Europe; before that date the traditions of Rome and Greece seem paramount, and the distinctively characteristic Byzantine style of Justinian's reign is exceedingly rare. Of the few Byzantine buildings remaining in the Holy Land, the most important are the substructures and Golden Gate of the Haram enclosure at Jerusalem. The two columns of the Venetian Piazzetta illustrate some of the peculiarities of the "Semitic" style. It will be noticed that the ornament is spread over the surface of the columns in a way peculiar to Saracenic art, without reference to any constructive meaning or appropriateness. The capitals are clearly enough copied from classical types, but instead of the Byzantine adaptation of classical detail, with its constructive meaning in volute and moulding, this more Eastern example is merely a network of ornamental detail and decoration. The ornament is the usual vineleaf pattern, so common in Semitic buildings, rock-cut tombs, and synagogues in the Levant. The vine as a decorative element in architecture is as characteristic of the Holy Land as the acanthus is of Rome or the honeysuckle of ancient Greece. The early Christians seem to have introduced it into Italy and Byzantium with their religion of Semitic origin. Another peculiarly common Eastern feature is the design in the side panels of clumsily-shaped vases holding flowers; in the present case the vases are almost indistinguishable from the floral ornaments. These clumsy attempts to represent one of the simplest objects suited to decoration sufficiently exemplify the helpless incapacity of the Semite to carry on artistic expression beyond the simplest forms of conventional ornament. Mohammed and Moses are both credited with a desire to prevent their disciples from studying the source of all truly progressive and fine art—the representation of living forms; but perhaps their objections to such art study may have arisen partly from a prudent consideration that it is

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no use doing anything in art unless you can do it well. Certainly the Semitic races have never displayed any qualifications for the higher branches of art, and the most admired of Saracenic monuments are more remarkable for an infinite multiplicity of minute details—insignificant and uninteresting in themselves—than for any æsthetic quality.

CAN WE DATE OUR SAXON CHURCHES?—I.

By Professor Baldwin Brown.

THE question of the distinction between Saxon work as a whole and Norman leads to the further problem of a chronology within the pre-Conquest period. This covers some 450 years, and within it it would be natural to expect considerable architectural changes. It is the purpose of these two papers, supplementary to those which have recently appeared in the *Builder*, to ask the question, What criteria exist for fixing the relative dates of the fairly numerous monuments which fall within the general limits of the period? With regard to some of these there is already practical certainty. For reasons which it would be tedious to discuss, all authorities seem at present agreed in assigning a date in the seventh century to the early foundations below Gundulph's work at Rochester, to Lyminge (the small apsidal church), St. Pancras Canterbury, Reculver, and Brixworth, and the crypts at Ripon and Hexham. Parts of St. Martin, Canterbury, may be even earlier; while, of northern examples, Escomb, Monkwearmouth, and Jarrow would be by most people included in any early list.

On the other side, there are not a few churches that are clearly of a very late date in the period. Kirkdale, Yorks, and Deerhurst Chapel are attested as such by inscriptions, and advanced Romanesque features, such as angle shafts and roll mouldings, in other examples bring them well forward in the eleventh century. In the case, however, of by far the largest number of Anglo-Saxon* remains there are no generally accepted signs of date, and opinions as to their respective epochs have been little better than guesswork. The ubiquitous Wilfrid has been credited at one time or another with a good proportion of our pre-Conquest churches, and the seventh or eighth century has been made responsible for work like the tower at Monkwearmouth, which probably belongs to the eleventh. Records of church building occur throughout the Anglo-Saxon period. After the first great missionary age was over, we read of events like the rebuilding in the eighth century of the church at York, with its thirty altars, that must, one would think, have given an impetus to church extension all over the North. Subsequent to this came the Danish desolation, but even after the inroads had begun we hear of local activity in church architecture on the part of bishops such as Swithun of Winchester, who died in 862 A.D. The close of the next century witnessed a widely-diffused revival encouraged by King Edgar and carried out under Dunstan, Ethelwold, and Oswald. Canute, at the beginning of the eleventh century, built and rebuilt numerous churches and monasteries, and in the middle years of it one of the laws ascribed to Edward the Confessor refers to the fact that there were then three or four times as many churches as in the early days, in terms which seem to imply that church building was a feature of the age just prior to the Conquest.

We can obtain a convenient division of the time from the conversion of Ethelbert to the Norman Conquest by making an early period end with the first inroad of the Danes and the ravage of Northumbria, a middle period cover the epoch of the Danish wars, and a late one begin with the reign of Edgar. These three periods would correspond roughly to the years 600-800, 800-950, 950-1066. Are there, we have to ask, any criteria by which we can distinguish the work of these periods; and further, if the "late" buildings, which in the nature of things will be most numerous, can be separated as a whole from the rest, are we able to subdivide these, say, into the Edgar group, the Canute group, and that associated with Edward the Confessor?

The possible criteria are those of general appearance and proportions, of plan and of details. It is obviously useless to argue that a building is of particularly early date because it appears rude and primitive in workmanship or is small in scale. If we did this we should have, conversely, to put elaborate or workmanlike structures, or those of large size, correspondingly late. But Wilfrid's crypts and the porch at Monkwearmouth are well wrought and cunningly enriched, while Brixworth is one of the largest churches of the period that we possess. The value of the criterion of the proportions of ground-plans may be judged from the evidence presented in the *Builder* of October 6, 1900, where it seemed to be indicated that very long and narrow proportions were an early sign, but that fabrics of quite other relative dimensions might be of equally remote a date. Height of walls should not be an early indication, for the peculiarity does not occur in the two classes of structures that may have influenced our early work—that is, in Irish oratories or in the basilican churches of Roman tradition. It may have been due to the desire to get the windows high up out of the way of the prowling spoiler, and this would locate the feature in the time of the Danish inroads or the Middle-Saxon period.

The criterion of plan as distinct from proportions is of more value as an indication of relative dates.

It is noteworthy here that in some of the very earliest structures we find already modifications of the simple Irish or Roman scheme that affect both interior arrangement and external form. Brixworth has a clear rectangular space marked off, possibly for monastic use, between nave and apse, and the early group in Kent show something of the same arrangement. The side chapel and the western porch of entrance appear at St. Pancras, and these seem the beginnings of what is again a specially Anglo-Saxon peculiarity—the gradual development from such elements of the cruciform plan and the western tower. If the transept grows out of the side chapel, we may infer the comparative dates of pseudo-cruciform churches by the stage at which the evolution is shown. Though no argument can be drawn merely from the fact of the presence or absence of a tower—for towers existed in Christian architecture as early as Anglo-Saxon churches—yet the *western* tower carries with it, as we shall see, an important chronological indication. Though it may not be possible to ascribe to any of our western towers a really early date, there may be differences of period among them that would be worth investigation. Brixworth and Deerhurst have an early aspect, and the latter has detail that seems the most Carolingian thing in Anglo-Saxon work.

This mention of detail brings us to the last and, in a sense, most important class of our available criteria. As a matter of practice, inferences based on the apparent place of a monument in an assumed scheme of development, though they have their place and value in architectural discussion, are seldom so cogent as the more direct witness of some definite feature or piece of detail, and in what follows attention will be mainly concentrated on evidence of this character.

The buildings above enumerated as by general consent in the first flight in respect to date are distinguished by the absence of certain features which are common in Anglo-Saxon churches generally. We do not find in them long-and-short quoins, double windows with mid-wall shafts, double-splayed lights, pilaster-strips, strip-work surrounding openings, nor, it may be added, internally splayed loops of a tall narrow form. In any discussion of the relative date of these features, there is, of course, a danger of arguing in a ring, and trying to prove X early by the absence from it of Y, and Y late because it does not appear in X. We are fortunately not left in this vicious circle, for several of the features in question appear on the continent in dateable surroundings, and this suggests a *terminus post quem* for their use in our own country.

The part of the continent where most of them are to be found is Germany. Hitherto there has been a tendency in discussions on this subject to turn to Italy for prototypes, but as a fact there is no need to bring Italy into the argument at all. We can find what we want in the way of prototypes much nearer home. The form of Wilfrid's crypts has been connected with that of the *cubicula* of the Roman Catacombs, but the truth is that such barrel-vaulted chambers are common enough in Gaul and Germany, where we find them of various ages, from the early examples, probably of the sixth century, that have been lately excavated in the cemetery of St. Matthias at Trier. The double belfry-openings belong originally to Italy, but Italy gave them to Germany where they are familiar features in a vast number of the Romanesque churches, and it is from German and not Italian sources that our pre-Conquest builders borrowed them. The Anglo-Saxon bell-tower, as a whole, has been claimed as Italian, but though Italy is the land of towers and produced them of most kinds and at all epochs of Christian architecture but the earliest, yet our particular form of tower, the single one joined to the church at the western end, is distinctly not Italian, but German. There are special features connected with Anglo-Saxon western towers, notably their growth in some cases from a western porch, which give them a place apart, but we can hardly dissociate the appearance of the feature in our later pre-Conquest architecture from its prevalence in the neighbouring lands of the lower Rhine and

* As these papers contain references to the architecture of Saxony under the term "Saxon," the expression "Anglo-Saxon" will be used to denote the examples in our own country.

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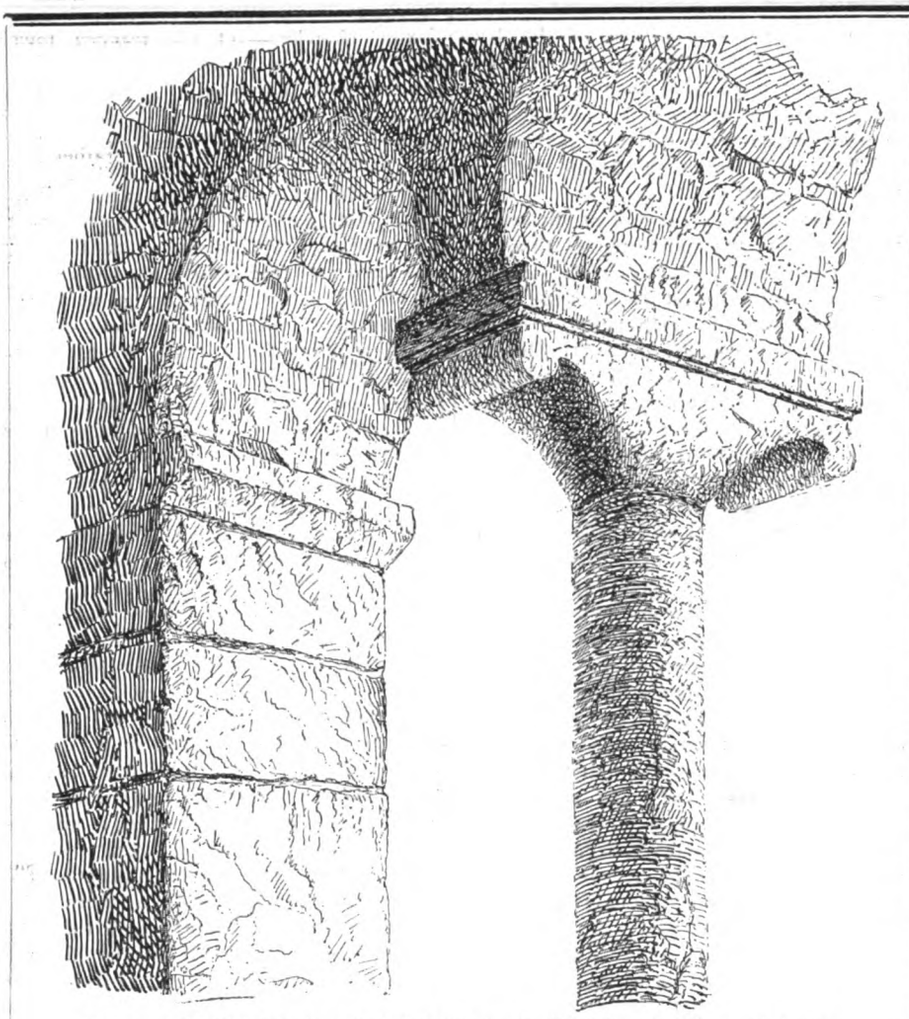

Fig. 1.—Mid-Wall Shaft and Corbel Cap in the West Front of Trier, Germany. Middle of the Eleventh Century.

Westphalia. It was from there and not from Italy that we were influenced in the large employment we made of the form. German, at any rate, is the half-round stair turret attached to the western tower, though abroad we generally find a pair of such turrets at the two sides of the tower instead of one in the front, as is the case at Brixworth, Brigstock, and our other examples.

Neither in Germany nor, to the writer's knowledge, elsewhere, do we find our elaborately-turned baluster-shafts, our long-and-short quoining, our strip-work round openings, and these must be regarded in the meantime as showing in our old English builders an original treatment of details which matches their special arrangements in planning and distribution. On the other hand, the mid-wall work, the double-splayed windows, and the upright pilaster strips appear in Early German Romanesque in much the same form as among ourselves. The only difference in the first case is that the through-stone, which is commonly with us a flat chamfered slab, is in Germany very often a moulded corbel cap that may either be used alone above its shaft, or may surmount a normal cap, plain or enriched, of the cubical type familiar in our Lincolnshire bell-towers. The small double-splayed lights have at times the central opening cut, like ours, in a mid-wall slab. The likeness between the German *Lisenen* and the Anglo-Saxon pilaster strips is generally acknowledged.

Any one familiar with the details of Anglo-Saxon buildings who explores, say, the west front of the Cathedral at Trier, of the first half of the eleventh century, from which is taken fig. 1, will be readily convinced that Germany is likely to furnish the most instructive parallels to our native work of the pre-Conquest period. When we reflect on the political and ecclesiastical connexions between the Carolingian realm and England, these affinities in architectural forms will not surprise us. If their existence is admitted, and we can discover when the features in question came into use in Germany, we shall find a valuable aid to the chronology of Anglo-Saxon buildings. To assume such borrowing is not derogatory to our native builders. Whatever we may have accomplished in the earlier period in the seventh century, there is no question that the Minster of Charles the Great at Aachen represents, both in construction and details, an architectural achievement that the England of the ninth and tenth centuries certainly could not match, and the Minster gave an impulse to building in Western Germany that carried the art rapidly forward. In the Carolingian epoch, and in that of the Saxon Emperors which followed it, as in the Gothic period two centuries later, England was receptive rather than herself a centre of architectural influence.

NOTES.

The New Government Offices. THE admirable article in the *Times* on this subject, noticed in our last issue, has been followed in Tuesday's issue by a communication "From a correspondent," obviously officially inspired, and which may be taken as a characteristic expression of English official obstinacy and Philistinism. It is now denied that the proposal to have Mr. Brydon's building carried out by the Office of Works originated in any idea of economy far from that, Mr. Akers-Douglas was only actuated by consideration for the comfort of those who would have to occupy the building. Then why did he say nothing about this motive when the question was asked in Parliament, and why did he pointedly assert, on the same occasion, that "a considerable saving would be effected"? The obvious fact is that the argument on account of economy has been discredited, and must therefore be abandoned. Sir John Taylor, we are told, is "an eminent architect," and carried out the front of the Record Office in Chancery-lane, "one of the most beautiful buildings in London." The apologist of the Office of Works could hardly have done worse for its cause than to let out that they consider that piece of cast-iron commonplace beautiful architecture; and in justice to Sir John Taylor—one of the most modest and amiable of men, who has the goodwill of all who know him—we do not believe he has ever claimed to be an eminent architect in the sense in which those words are generally understood. Mr. Tanner, we are told by this official spokesman, is not so well known, but no more was Sir J. Taylor when the Record Office was entrusted to him, yet "The choice is amply justified by the result;" and so we are told it will be with Mr. Tanner, whom unfortunately we know chiefly as the architect (by repute) of the various Post Office buildings. The summary effect of the whole communication is that the Office of Works is a Department as self-satisfied as it is ignorant; that the First Commissioner of Works has got the matter in his hands and means to keep it, apparently from sheer obstinacy and a refusal to give way to the opinions and advice of those who really know what architectural design implies.

Public Buildings and the Office of Works. LORD WEMYSS, who, in spite of his curious faith that the making of models of buildings would infallibly revive the art of architecture, and who is really to be praised for his perseverance and enthusiasm in the cause, has called attention in trenchant language to an absurdity which we have frequently commented on—that of placing the national public buildings of the country under the charge of an official who is appointed solely for political reasons. It is perhaps rather hard on the present First Commissioner of Works to make a scapegoat of him; for although, as Lord Wemyss says, he was never heard of as an architectural authority before his appointment to his present office, this criticism would apply equally to most of his predecessors, and he has at all events shown more disposition to take competent advice on the subject than some of them, and not done the active mischief which has been brought about by other First Commissioners who were as ignorant but more self-confident. It is the system itself that is absurd. Lord Wemyss intends, on the re-assembling of Parliament, to move for the appointment of a permanent Royal Commission to whom all designs for public buildings, monuments, or "plans for the mutilation of our parks," should be submitted and, if approved, be exhibited in model for public criticism before they are carried out. Whether either the models or the public criticism will help the cause much

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may be a question; but it is quite certain, at all events, that architecture has nothing to do with politics, and that questions of public architecture ought to be settled by a permanent tribunal or department of persons appointed for their knowledge of the subject, and not by officials appointed only on political grounds, and to be superseded at every change of Government.

Formal Street Architecture.

ONE of the practical objections to regularity in large schemes of street architecture is very much in evidence at this time of year. Take, for instance, the work of the Adam Brothers in the Adelphi, or Regent-street, and the houses round Regent's Park, the work of John Nash, or any of the great formal blocks of street houses in the Bayswater-road. The landlord or lessee of every alternate house or so is having the exterior of his own particular frontage painted in the colour of his fancy; from the coping to the iron railings in the basement every feature is divided in fair proportions by the conscientious house decorator; thus reducing formal street architecture to an absurdity. Many of these streets are built in stone, but paint is used all the same as the best means of preserving it from the inpurities of the atmosphere. The Quadrant of Regent-street was a striking architectural conception, and the sweeping horizontal lines produce a fine effect even since the basis of the design was swept away. There is no doubt that the arbitrary restrictions imposed upon street architecture allow small chance for any great improvement on the existing state of things. When there is no recognised local building material the chance of harmonious treatment of the streets is very remote. Individual liberty and enterprise is too much respected to suffer such restrictions as the Parisians experienced under Napoleon III. and his Prefect, Baron Haussmann. Under that autocrat Paris gained a certain dignity and completeness that few other cities can boast of; at the loss, it is true, of much that was historically important. Such as is the London Building Act, clauses of which cripple legitimate opportunities in design, in our opinion the Act should recognise the shifting character of a town population and make such provisions as would protect existing formal street architecture from the incongruities which render it absurd, and are a cause of discouragement to new schemes of centralisation and improvement such as are needed in these days when the population of cities increases so rapidly.

London Thoroughfares.

THE streets of London are never free from the excavations and repairs that follow so quickly upon each other, but during August and September most of the principal thoroughfares are given over to the Authorities. Whitehall, the Strand, Piccadilly, the Marylebone-road, and the High-street, Kensington, are only some of the roads that are "up" and more or less impassable. Roads built of whatever material wear out, and need to be relaid, and no time is better suited for doing this than during August and September; but what we hope some day to see is a system in doing these renovations. "The Authorities," whoever they are—and it is very hard to ascertain—are content with the patchwork system of 100 yards of wood block paving here, and 200 yards of asphalt there, and setting the steam-roller to work over the way, with the result that such a thoroughfare as that from the Bank to the Uxbridge-road consists of samples of every kind of road-making. There ought to be one responsible head to introduce an intelligible system carried out with as little inconvenience to the public as is compatible with large schemes. We remember during the Architectural Congress last year more than one speaker calling attention to the historic use of the river as a thoroughfare. Some day it will be recognised that the river can bear a more considerable part in passenger traffic than it now does. If there were a well-organised, speedy, and comfortable service of electric boats, it would be a matter of pleasure as well as of health to use the river instead of the "Tube" or the "Underground."

Labour Statistics.

THE annual Report of the Labour Department of the Board of Trade for the year 1900, which has just been published, is of more than usual interest; for it chronicles the fact that "the year 1900 was the culminating point of the upward movement of wages which began in 1896," and that the general level of wages stood higher at the end of 1900 than in any other year for which statistics exist. In other words, in the last year of the nineteenth century the artisan was in a more flourishing condition than at any other time in the history of this country. But the same Report also states the fact that from the end of 1900 wages began to decrease, and this downward movement is certain, there can be little doubt, to continue for some time to come. As regards the hours of labour, it is interesting to note that one of the most important changes was that in the cabinet trade, there being a reduction of two and a half hours per week, affecting 8,000 cabinet-makers in London. In the building trades there were 9,111 people affected, and a reduction of 8,016 hours for a full week, which represented an average reduction in hours per week of 0·88. Thus, together with an increase in wages, there was a reduction in the hours of labour, all tending to show how much the condition of the working classes has been improved in the century which is now at an end. We wish we could say that the wages had increased and the hours of labour decreased among indoor workers such as clerks and others.

High-Pressure Mains.

THE Committee which was appointed by the London Chamber of Commerce to consider what modifications were desirable in the Board of Trade Rules regarding high-pressure electrical mains have now sent a series of suggestions for altering existing rules to the Board of Trade. The Committee is thoroughly representative of commercial electrical engineering, and so it is naturally anxious that the industry should be hampered by as few restrictions as possible. In the first place, it is suggested that pressures up to 20,000 volts at least should be sanctioned, and they make a strong plea for the use of overhead wires for the transmission of energy, pointing out that overhead work at very high pressures has been in use in America and the Continent for the last ten years, and that great industries have sprung up in consequence which have no counterpart in this country. They also say that they are "strongly of opinion that permission to use overhead wires outside crowded city areas is vital to the commercial success of power schemes over large districts." We were rather surprised to read this, seeing that many members of the Committee are directors of "power schemes over large districts" which have recently begun working. It seems to us rather rash to start large commercial undertakings which can only be successful if the present Board of Trade Rules are altered. We are well aware that power is being distributed in America at voltages above 20,000, but we doubt whether any of these undertakings is really successful, and whether their engineers have guarded against all contingencies. For example, the use of aluminium wires has been attended with indifferent results, their frequent breakages making the service very uncertain. The raising of the pressure of supply of the Niagara Falls Company this year from 11,000 to 22,000 volts has been attended with several untoward incidents. The first thunderstorm earthed the line, and so the traction and lighting systems of Buffalo, where the Pan-American Exhibition was being held, were shut down for nearly an hour. Again, the engineers calculated that a break of 4 ft. 6 in. would be sufficient for the high-tension switches, and so they were all made with this sized break. The break, however, is found insufficient, as the switches arc across, the flames sometimes rising to the ceiling. They are now all being replaced with switches having a 6-ft. break. Further West the engineers frankly confess their inability to guard against all contingencies, and so the transformers are mounted on four-wheeled trucks, which can be run out into the open air the moment they catch fire. Some modifications of our Board of Trade Rules are desirable, but we think that this Committee is asking too much.

The South Transept Window, Westminster Abbey.

IN our "Note" of last week (page 188, *ante*) we adverted to the removal, now in progress, of the modern stained glass from the great rose window in the south transept of Westminster Abbey. We may here mention that the stonework of the window was renewed in 1814 by Thomas Gayfere, the younger, as master mason to the Abbey Church, under the directions of Benjamin Dean Wyatt, who in the previous year had succeeded his father, James Wyatt, as surveyor to the Abbey. In 1847 Thomas Ward and J. H. Nixon inserted the brilliantly-coloured "marigold glass." As the scheme stands at present the three two-light windows and the six lancets beneath will be filled with figures of Fathers of the church, together with coats-of-arms in the cinquefoils, and (in the lancets) of SS. Alban, David, Patrick, Ninian, Aidan, and Augustine of Canterbury, and also with certain historical and local heraldical devices.

Michelangelo's House in Rome.

WE gather that this notable house is threatened with destruction, in order to provide for a widening of the Corso, for the completion of the monument in memory of King Victor Emmanuel II. The house, which was distinguished with a commemorative tablet about forty years ago, was occupied by Michelangelo during the last twenty years of

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his life, when, declining the invitations of Duke Cosmo to return to Florence, he preferred to abide in Rome that he might continue the building of St. Peter's, to which he was appointed architect in 1547, and his work in the Vatican Palace. During the interval we mention he completed, in 1550, the monument of Pope Julius II., designed the model (1558) for the dome of St. Peter's, and composed his sonnets in honour of Vittoria Colonna.

Stratheden House, Knightsbridge.

WE hear that the freehold site of Stratheden House, Knightsbridge, latterly the residence of Mr. Mitchell Henry, has been lately purchased for about 85,000*l.* The house, which has been recently demolished, was occupied by Lord Campbell, who there wrote his "Lives of the Lord Chancellors of England," and "Lives of the Chief Justices." He died there, suddenly, in 1861. The ground covers an area of about 4,400 square yards, having a frontage of 128 ft. 6 in. to the main Kensington-road, with a return frontage of 306 ft. 6 in. to Rutland-gardens. In March, 1899, had been accepted the designs of Mr. W. I. Chambers for a block of residential flats, each consisting of fourteen large rooms, with balconies, and having a spacious entrance hall, which it was proposed to build on the site; but the property was withdrawn from sale at auction in June last year after a bid of 89,000*l.*

The Latest Competition Dodge.

AN advertisement recently appeared in our columns to the effect that young architects who were experienced in street architecture were invited to enter into a competition, the conditions of which could be ascertained from the advertiser. The real object of the advertisement is disclosed in the following reply, lithographed copies of which have been sent to us by several indignant "young architects" who had answered the advertisement. We omit name and address:—

"DEAR SIR,—In reply to yours, a competition is advertised by the —— Corporation, limited to architects practising in this town.

It is our intention of joining (*sic*) in the competition, but pressure of work prevents us from dealing with the matter as we should like; therefore we are inviting young architects or others, who have had experience in street buildings, to send in plans, the successful competitor to be appointed joint architect with us.

If you care to enter into this competition we will forward you full particulars, with block plan, on receipt of 1*l.* 1s., which will be returned on receipt of bonâ-fide plans."

We can hardly imagine a more impertinent and insulting proposal to make to architects of ability than to invite them to sell their talents to a man who is evidently conscious that he would have no chance in the competition himself, but who is to pose as a "local architect" by sending in their designs from his office. We must regret that such an advertisement should have found its way into our columns, but there was, of course, nothing on the face of it to indicate its real nature and object.

BATHS AT OLDHAM.—The new baths which have been erected by the Oldham Corporation at Robin Hill, off Rochdale-road, were opened on the 29th ult. The total cost is a little under 10,000*l.* The baths include thirty-six private or slipper baths, with separate entrances and corridors for females and males, and a swimming bath, 75 ft. long by 27 ft. wide, 6 ft. 6 in. in depth, sloping to 3 ft. 6 in. at the other end. The work has been carried out by Mr. Emanuel Whittaker, of Oldham, from the designs of Mr. C. T Taylor, of Oldham.

LETTER FROM PARIS.

THE competition for the Grand Prix de Rome in Architecture, for which the subject was "An American Academy of Arts and Science at Paris to be constructed on a portion of the ground left vacant by the demolished fortifications," was decided as follows:—the Grand Prix de Rome was awarded to M. Hulot, pupil of M. Marcel Lambert; the 1st Second Prix to M. Prevot, pupil of MM. Guadet and Paulin; and a mention to M. Barrias, pupil of M. Pascal, in the place of the 2nd Second Prix, which the jury decided not to award this year.

The historical Château of Saint-Germain is now being restored so completely and in such a manner that those who know the château will hardly recognise the building when the work is terminated. Under the pretext of restoring and completing the whole building in the style of Francis I., all the portion constructed since that epoch, principally by Mansart, has been demolished and the old foundations filled in; a new tower in exact counterpart to those existing on the façade facing the Seine will take the place of the old portion, thus entirely changing the aspect of the château on the façade facing the square.

As already mentioned in our columns, the art director of the Manufacture Nationale de Sèvres has in hand ready for execution the designs and details for the porcelain tower which is to be erected on the plateau of Saint Cloud. The tower will be 150 ft. in height, and will consist of a polygonal base which will be decorated on each face by the work of one or another of the best known Parisian sculptors, supporting a circular tower decorated with elegant columns, the whole to be constructed of ceramic ware with an outer covering of porcelain. An iron staircase in the interior will lead to the summit of the tower, crowned by a shapely dome surmounted by a decorative finial and surrounded by figures of animals. The whole of the work will be executed by the manufactory of Sèvres: the general tone will be mother-of-pearl, heightened here and there by glints of topaz, turquoise, and coral.

A small proportion only of the exhibitors at the 1900 Exhibition have received the medals awarded to them, medals engraved by M. Chaplain, and of which there are about 60,000. As each medal will have to pass through the Mint a second time to receive the name, &c., of the exhibitor, and as only about one-tenth of the medals have been struck up to this time, exhibitors must have patience for some months to come.

The Institut has awarded the Prix Léon Faucher, of the value of 120*l.*, to M. Flour de Saint-Genis, late Conservateur des Hypothèques, for his work entitled "The Present Situation and the Future Outlook of Large and Small Landed and Other Property in France." The Académie des Beaux-Arts has awarded the Prix Bailly, value 60*l.*, destined to recompense the architect of an important and interesting work, to M. Malgras Delmas, architect, of Saint-Quentin, for his Palais de Fervaques in that town. The Prix Bordin, value 120*l.*, for which the subject of competition was "Characterise the talents of the French painters who helped to make illustrious the first half of the nineteenth century," is awarded to M. Eugène Guillon, Paris.

The work of enlarging the Palais de la Bourse at Paris is now well in hand under the direction of M. Cavel, Architect to the city of Paris.

A sum of 4,000*l.* has been voted for the continuation of the restoration of the church of St. Eustache, near the Halles at Paris.

The Minister of Public Instruction and of Fine Arts has just appointed M. Emile Bertone, late Prix de Rome, on an archæological mission in Greece and Turkey.

A new museum, destined to contain exhibits of the best of the various works sent in by the students of the Ecole des Beaux-Arts for the school competitions and the Prix de Rome, is being prepared by M. Louis Bernier, architect, in the premises of the old and once well-known official studio André of the Ecole, vacant since 1892.

It is proposed to construct a new bridge over the Seine between the Pont des Arts and the Pont Neuf, almost in front of the Louvre, where the prolongation of the Rue de Rennes will join the river.

The Municipal Council has granted the credits necessary for the isolation and restoration of the old Collége de Medecine, called the Hôtel Colbert, an interesting building composed of two portions of very pure work of the fifteenth and eighteenth centuries. The owner of the old Hôtel des Evêques de Sens has offered to pass over the building to the Municipality for the sum of 60,000*l.*; it is to be hoped that this offer will be accepted, for it will save from destruction the most curious and interesting specimen of mediæval architecture existing at Paris, next to that of the Hotel de Cluny.

The question of the Cirque des Champs Elysées is at last decided, and a contract has been signed with M. Leoncavallo by which the Municipality hands over the ground to this gentleman for the purpose of constructing thereon an international theatre of opera.

It has been decided that the ventilation of the tunnels of the new Metropolitan Railway leaves much to be desired, and the question of ventilation by means of openings through the vaulting into the streets, and the covering and decoration of these openings, is much discussed.

The work of arranging and decorating various new rooms at the Louvre Museum is constantly in hand. One of the latest rooms, now nearly completed, is that close to the last of the rooms for the exhibition of engravings and drawings. This room is destined to receive the magnificent and valuable collection of ecclesiastical gold and silversmiths' work of the middle ages, given to the museum by the late Baron Adolphe de Rothschild, and valued at several millions of francs. The donor added to his gift the sum of 10,000*l.* for the purpose of preparing a room worthy of the collection, and a portion of this money has been spent on a magnificent ceiling in Venetian style and some very rich wainscotting for the walls of this small room.

The fourth exhibition of decorative panels, sketches, studies and water colours executed by the artists of the Manufacture Nationale des Gobelins, is now being held at the manufactory. Several tapestries by M. Emile Maloisel, "The Herd," "The Shepherd," and "Morning Mist," are worthy of attention amongst the exhibits. A portrait by M. Lallemand, and several original etchings on holland by M. Damazy, are much admired.

The celebrated laurel-crowned bust of Victor Hugo, one of the finest of the works of David d'Angers, has just been presented to the Institut de France by the family of the poet. This bust was executed by David d'Angers in 1842, after reading the "Rhine" of Victor Hugo and as a token of his great admiration for the poet. The original clay model of this bust may be seen amongst the works of David at the museum at Angers; a plaster cast was given by David himself to his friend Victor Pavie, and still exists; the third and last repetition of the work is that in bronze to be seen in the museum at Besançon, the birthplace of Victor Hugo.

The memory of the celebrated artist workman, André Charles Boulle, who was born at Paris in 1642, and whose personal talent in the work of enriched furniture, bronze, copper, ivory, and other materials has made his name famous, will be perpetuated by a monument to be erected in the Faubourg Saint-Antoine, the centre of the furniture workshops at Paris. The design has been entrusted to a young sculptor, M. Edouard Jacques, and the work will represent a workman in his ordinary working clothes, his tools placed on the ground near him, in the act of raising a young boy who is lifting his cap in respect towards the bust of Boulle. Louis XIV., who was a great admirer of Boulle, gave him a special mark of his favour in allowing him to take up his quarters in the buildings of the Louvre as cabinet-maker, architect, and engraver of the Royal seals to the King.

The monument to the celebrated landscape painter, Louis Français, was inaugurated on August 18 at Plombières-les-Bains. The work is due to M. E. Peynot, sculptor, and MM. Godefroy and Curvat, architects. A well-designed and lofty pedestal, placed in the centre of a hemicycle of Vosges granite, carries the bust of Français; on the front of the pedestal is a draped figure of a young woman holding a branch of oak towards the master; at her feet a figure representing the rustic Muse, decorated with garlands of wild roses, plays the pipe of Pan.

The work of partially restoring and rearranging the Palais of the Luxembourg is rapidly going on under the care of the architect, M. Scellier de Gisors. A large scaffolding at present masks the Pavillon de l'Horloge on

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the chief façade of the building, for the purpose of placing in position the four ancient allegorical statues modelled by Pradier, but which, being executed in soft stone, did not withstand the ravages of the weather, and have now been sculptured anew in hard stone by M. Crauk.

A fine piece of work for an epergne or table ornament has just been completed at the manufactory of Sèvres by M. Raoul Larche, and consists of a central piece entitled "The Year," represented by the figure of a young woman clothed in long drapery, held up and surrounded by a number of figures of children, representing the "Days." The four angles of the piece consist of figures representing the "Seasons" and "Months." Another piece of work now being completed at Sèvres is the set of panels for the decoration of the refreshment-room of the Palais Bourbon. The panels are formed of about fifty squares, and are entitled the Four Seasons; Spring and Summer being designed by M. Alfred Boucher, Winter and Autumn by M. Constant Roux.

AUCH.

WE imagine that there must be few interiors more simply beautiful, and that convey a more lasting impression of delight to the mind, than does the cathedral at Auch, which, in contrast with the hurry and bustle of the streets outside, seems to breathe nothing but a calm peace; but as these lines are written for the benefit and encouragement of the student, we must, instead of indulging in rhapsodies, confine our efforts to a description of the main points most likely to interest and instruct him. These are (*a*) the severe and simple treatment of what, as a rule, has the fault of *abandon* and ultra-elaboration—its Late Flamboyant work; (*b*) the gorgeous colouring and quaint mannerisms of its late painted glass; and (*c*) the wonderful beauty and excellence of its plan, as well as the splendour and variety of detail of every part of its stalls and subsellia, second only, if at all, to those of Amiens and Ulm, but equal to either in completeness of scheme and entire freedom from mutilation—an unusual condition, which must be taken to heart. Easily reached by railway from Toulouse, and commanding lovely views of the Pyrenees, it is a city of amply sufficient attraction to the general tourist, but to the antiquary and the art-lover it should approve itself as a far more attractive and delightful hunting ground than, thus far, it seems to have become. The great Revolution has undoubtedly left sad marks behind, yet one must take comfort to find so little damage done during that unhappy epoch. A singular lesson of the ways of the later masons may be learned on the south side of the cathedral, where, as at the west front of Rouen, work built up for the carver to work out his imagination upon still remains *en bloc*. The old escutcheons of dead and gone families have been ruthlessly torn from their moorings, and history suffers in consequence, but the building is rather a gainer, from the fact that their places have been filled up with plaques of beautiful specimens of Pyrenean marbles.

Auch is the principal town in the Department of Gers, having some 14,000 inhabitants, and there are many old houses of interest still remaining in its streets to the north of the cathedral, which, with the city, is placed on a high platform sloping away to the west, and from which long flights of steps lead to the sandy plain below to the east of the building. The great Antoine Mégret, Baron d'Etigny, who died all too young, and whose works abound at Bagnères de Luchon and other places in the adjoining country, as a great promoter of tree-culture, laid out the Cours d'Etigny here, from which, in clear weather, there is a fine view of a considerable part of the Pyrenean range. There is a poor statue here raised to his memory, very inferior as a portrait, and still more so as a work of art, to that at Luchon. As the capital of the Ausci, and in later times of the Comté d'Armagnac, the city has much historical interest, and, commercially, by the brandy of Armagnac (preferred by many to that of Cognac), which is produced hereabouts and forms a great article of trade. The place may also be visited well from Pau, eighty-nine miles off by rail, but the route via Toulouse is much shorter, and to the student of old glass is instructive as forming a good example by way of comparison, both places abounding in good work. This railway passes through Gimont-Cahuzac, probably the cradle of an old Gascon family, now to be found in England — Cusac or Cahusac (?), the affix "ac" being very common hereabouts. There is not much to attract on the journey, to which the slowly-flowing, muddy, and shallow stream of the Gers contributes little or nothing, so that, when reached, the charm of the place is all the more refreshing. "La métropole de la troisième Aquitaine fut invariablement soumise à Saint Pierre de Rome." It is the seat of an archbishopric, no less than eleven of the occupants of which have received the honours of the Cardinalate, and of whom the 88th, François Guillaume, Cardinal de Clermont-Lodève, invited Arnaud de Moles to undertake the eighteen large windows in the Chevet. Dominique de Vic, the 96th, supplied the three rose windows at north, south, and west; the 97th, Henri II. de Lamothe-Houdancourt, built the western towers; and the 99th, Augustin de Maupeon, founded the Hospital of Auch. The Classic west front, with two towers of the Corinthian Order and a large western porch or narthex, has a peculiarly Italian air about it. There is a charming sense of spaciousness about the interior, the arches of which have no capitals to receive their mouldings, but these, bolder than usual in similar work, pay out gracefully upon the filleted drums of the piers. The bases are elaborate, somewhat high from the floor-line, and with interesting interpenetrations. The triforia, three-centred in form, with plain, straight mullions and no traceries, have elegant open screens for protecting their gangways, with carved fronts of apparently somewhat later date. The vaulting is quadripartite, with circular bosses, and was finally completed in the time of Louis XIII., the western towers forty-five years later. The tracery to the windows is peculiar, very free in line, and in general composition most graceful, recalling some of those at Notre Dame de Brou, at Bourg, but evidently the work of an original genius who scorned to be a copyist.

The crypts and tombs are well worthy of careful study. The bells are hung in the north, but the *bourdon* only in the south tower.

The stained glass, 1507-13, is the work of a Saxon artist, one Arnaud de Moles, and there are several windows of this unique series reproduced in Mr. Westlake's admirable book on the subject, but no publication can give the wonder of its colour effect. He says:—"A tradition that his eyes were put out that he might not repeat his glorious work elsewhere is, fortunately, without any historical evidence or probability, for, as we have seen, there are works of his elsewhere in the neighbourhood, viz., at Fleurance and at the Abbey of Simorre." These windows occur in the eastern chapels, of which are the following:—Du Purgatoire, de Saint-Cœur de Marie, de Notre Dame de Pitié, de Saint-Anne, de Sainte-Catherine, du Saint-Sacrament, de Saint-Louis, de la Compassion, de l'Ascension, de Notre Dame d'Auch, which before 1860 had been dedicated to the Holy Spirit. The subjects, very rich in colour and varied in composition, include apostles, prophets, bishops, sibyls, &c., and abound in grisaille work, arabesques, heraldries, legends, &c. There is a quaint humour about the whole work which, compared with that of the same date in the country, is very naïve and refreshing.

The stalls, 113 in number (1520-46), constructed throughout in the "kindest" of oak, and elaborately detailed in every part, represent, by large single figures taken from Jewish, Christian, and Pagan sources, a wide field of history. There are no less than fifty life-size figures, to say nothing of subsidiary subjects. The whole work has been marvellously preserved by constant rubbing, apparently with oil, and their present appearance is well and truthfully described by Viollet-le-Duc as having all the effect of being wrought in *cornelian*, so delicate and transparent do they appear. The gangways are wisely placed so as to flank the arch-piers. There is a lofty screen to west of the stalls, with choir, organ, and rood over it, the stalls forming a part of it below. The design of this organ is in harmony with the screen itself, and there is yet another large and very fine organ at the west end of nave, evidently of the same age as the western towers. Much of the rood is apparently modern, but in good taste, with six large angels holding trumpets below it. One very excellent point in the arrangement of the stalls is brought out by the agreeable break, octagonal on plan, round the piers, which prevents, in a natural way, the long straight line usually found in canopies over stalls; every portion of which here has received a full measure of attention and care, both as regards utility and beauty. The pose and the draperies of the figure sculpture, the treatment of traceries, pinnacles, crockets, finials, and grotesques, misericordes and elbows, can hardly be surpassed. They are certainly the best preserved stalls in France; that of the Archbishop is on the south side of the screen doors. To sum up the whole, the one word *thoughtfulness* seems to do so exactly, and neither the whole nor the parts seem to escape it.

The first bishop of Auch was Citére (A.D. 313) The first archbishop and fifty-fourth bishop was Bernard (A.D. 946). Four times demolished and renewed, the church was refounded in 1486 (*temp.* Charles VIII.), and finally completed (*temp.* Louis XIV.) save for a few modern details comparatively unimportant.

The height of the interior is 87 ft. English, and the length of the interior 102 m. 86, inclusive of the west porch, and the width 34 m. 95. There are twenty-one chapels—ten of them to the west of the crossing, and eleven at the chevet. The nave has five bays and the choir four bays, the whole terminating in a five-sided apse; the easternmost bays of the choir are much narrower than the three bays to the west of it. The building was consecrated February 12, 1548, under the name of "Nativity of the B.V.M."

There are no sham flowers, trumpery fittings, or tawdry images here to disturb the beauty of the delightfully delicate brown stone of which it is built. Truly a rare condition of things. In conclusion, let me advise the student to choose a cool month for visiting this interesting old city, or even to repeat my own experience of July heat and a plague of flies rather than omit to see it altogether.

E. SWINFEN HARRIS, F.R.I.B.A.

THE ARCHITECTURAL ASSOCIATION.

IN the printed curricula of the Architectural Association for 1901-1902 some further particulars are given of the arrangements made for the starting of the new day classes. The fee for the full course is 12 guineas per term, or 35 guineas per annum; or, for the lectures only, 2 guineas per term, or 5 guineas per annum, for either the history or construction course. After payment of the fees for the first year's course, students will be eligible for election as ordinary members of the Architectural Association without payment of the usual entrance fee of 2 guineas, and as ordinary members they would be eligible to compete for the prizes and studentships.

The following subjects are included in the curriculum:—*First year's course.—The studio:* The use of instruments and scales. Free-hand drawing. Elementary perspective. Orders of Classic architecture. Elements of the various styles of architecture. Principles of mechanics. Elementary construction. Sketching and measuring details and portions of existing buildings. History of architecture, thirty-six lectures (illustrated by visits to buildings and museums.) Elementary construction and materials, thirty-six lectures (illustrated by visits to workshops and buildings in progress).

Work in the studio will be carried on daily, varied by visits to buildings, galleries, and works in progress as will be arranged from time to time. The lectures will be delivered by the master on two afternoons in the week. There will be seventy-two lectures, thirty-six on the history of architecture and thirty-six on elementary construction and materials. Twelve on each subject in the term.

The general idea of the lectures on the history of architecture is as follows:—

1st term. Early history of architecture in Egypt, Greece, and Italy.

2nd term. Continuation of the subject, with development of Byzantine from Roman work to Romanesque and the commencement of Gothic.

3rd term. Outline of mediæval and Renaissance architecture, with a sketch of the subsequent history of the art up to the present time.

The scheme of the lectures on elementary construction and materials is as follows:—

1st term. Elementary course on foundations, brickwork, and masonry.

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2nd term. Outline of timber and metal construction.

3rd term. Some account of roof coverings, plumbing, plastering, joinery, and finishing.

Every student will be expected to take up a course of reading under the direction of the master, and will be required to refer to works on each subject concurrently with the lectures on the same, and for this purpose the studio library will be available. The master will direct students as to their vacation studies, and a due proportion of outdoor work will be expected of all during the summer. The character of the instruction will be of a strictly preparatory nature, adapted to pupils proposing to be articled and enter the office of an architect. The aim of the master will be to direct the student's studies towards the knowledge of all that is accepted as the best in ancient and modern architecture.

Second year's course.—Continuation of the subjects forming the first year's course. Advanced perspective and sciography. Descriptive and applied geometry and graphic statics. Principles of architectural design.

In reference to the evening school, the work will be carried on by practically the same lecturers and instructors who assisted last year.

As to the general meetings of the Association, the opening address by the President, Mr. W. H. Seth-Smith, and the distribution of prizes will take place on the 11th prox., and the conversazione will be held at the Royal Institute of Painters in Water Colours, Piccadilly, on the 25th prox. The following is the programme for the succeeding meetings :—

November 1, Mr. A. Wood, M.A., F.S.A., on "Cambridge in Early and Mediæval Times ;" November 15, Mr. Max Clarke on "The Sanitation of a Country House ;" November 29, Mr. Francis Bond, M.A., on "Capitals ;" December 13, Mr. J. E. Forbes on "Travelling Students' Notes ;" January 3, Mr. J. A. Gotch on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century ;" January 17, Mr. T. C. Cunnington on "Architectural and Constructional Engineering ;" January 30, Mr. C. Harrison Townsend on "'Originality' in Architectural Design ;" February 14, Miss Ethel Charles on "A Plea for Women Practising Architecture ;" March 7, Mr. J. Miller on "The Glasgow Exhibition ;" March 21, Mr. W. H. Lever on "The Dwellings Erected at Port Sunlight and Thornton Hough ;" April 11, Mr. W. D. Caröe on "The Preservation of Ancient Buildings ;" April 25, Mr. E. A. Gruning on "Arbitrations ;" and May 9, papers by Mr. Owen Fleming on "Artisans' Dwellings from the Municipal Point of View," and Mr. Louis Ambler on "Artisans' Dwellings from the Private Point of View."

THE SANITARY INSPECTORS' ASSOCIATION :

AUTUMN CONFERENCE AND MEETING.

THE proceedings in connexion with the autumn meeting and conference of the Sanitary Inspectors' Association opened on Thursday last week at Carpenters' Hall, E.C. At a general meeting, Archdeacon Sinclair was elected an honorary member.

Sir Hugh Gilzean Reid, the President of the Association, occupied the chair at the Conference which followed. In his opening remarks he expressed satisfaction that the objects of the Association, to raise the standard of efficiency of its members and to afford all reasonable protection to their interests, had been justified. He referred particularly to the value of the Bill drafted for securing to Medical Officers of Health and Sanitary Inspectors full security in their respective positions and adequate retiring allowances. When this measure passed—as he was sure it would—stability to their occupation would be assured. He also regarded the proposal to appoint a Minister of Health as an excellent one, and, although we were rather slow in moving in this country, he did not think much delay would occur before such a reform as this were introduced.

Sir Alexander Binnie, C.E., Chief Engineer to the London County Council, followed with a description of the London main drainage system. He remarked that some idea of the difficulty of draining London may be gathered from the fact that out of 121 square miles within the county at least 10 per cent., or 12 square miles, are situated below the high-water level of the Thames. Having described the features and course taken by the main sewers, and pointed out that up to 1888 the sewage of the metropolis was discharged into the Thames at Barking and Crossness, Sir Alexander mentioned that it was on the advice of his predecessor in office, Sir Joseph Bazelgette, that a series of precipitation works at the two outfalls were commenced. "The principle adopted in these works is," he continued, "that of a chemical precipitation, four to five grains of lime and one grain of sulphate of iron per gallon being added to the crude sewage. It is then admitted into precipitation channels, from which the effluent water passes into the river. The sludge so deposited, after a further period of sedimentation, is pumped into ships and deposited in the sea twenty miles below the Nore. These works as originally designed were estimated to deal with 150 million gallons of crude sewage a day and 3,000 tons of sludge per day. The total quantity of sewage now dealt with is about 132 million gallons a day at Barking and 98 million gallons a day at Crossness, a total of over 230 million gallons. The quantity of sludge sent to sea is over two million tons per annum, containing a little less than 10 per cent. of solid matter. There are six ships of 1,800 tons gross and 1,000 tons net capacity engaged in this work, and in the year 1900 their aggregate number of voyages totalled a distance of 236,000 miles. The capital cost of works of precipitation only, including ships, was 1,079,000*l.*, and the annual cost of working is about 161,000*l.* The river, which previous to 1890 was exceedingly foul in the neighbourhood of the outfalls, with large masses of black, floating matter, is now comparatively free from all noticeable pollution. . . . Within the last twenty years, however, principally owing to the valuable series of experiments carried out at Massachusetts, in the United States, we have been brought face to face with the fact that the elimination of dead effete matter is largely, if not entirely, due to the action of various microbe organisms. These organisms, acting for a longer or shorter period, appear to be able to reduce dead organic matter into an inert and harmless condition. I have studied the question very carefully for the past eleven or twelve years, and the conclusions at which I have arrived may be briefly summed up as follows :—That, as far as possible, all solid and floating matter should be removed from the sewage by mechanical means ; for, although undoubtedly these solid and suspended matters would ultimately be destroyed by the micro-organisms, yet the time required would be too long to admit of its application in ordinary cases. Second, that as far as possible, such minute suspended matter still remaining in the sewage should be reduced by the aid of those organisms with which we are well acquainted, from the solid to the fluid state. This, to my mind, is the first step and the first lesson which we have clearly learned from our investigations into this wonderfully interesting subject. The effluent sewage containing, then, a large proportion of dissolved organic matter is in a condition to be further treated either by intermittent filtration in what are called contact beds, or by some other means being brought into contact with those organisms which have the mysterious power of reducing these dissolved organic substances, which, if left to themselve, would putrify and be the cause of offensive smells, if not of dangerous consequences. In the case of intermittent filtration and contact beds considerable difficulty arises from the presence in the effluent, along with the dissolved organic matter, of certain mineral substances in a minute state of subdivision, derived, no doubt, from the washing of the streets. These latter substances, of course, cannot be acted upon by any species of bacteria ; consequently, in course of time, they tend to clog up the filter-beds themselves. But intermittent filtration and contact beds is not the only mode of treating the sewage effluent which has been deprived of its grosser and more palpable organic matters. It is a well-known fact that if the sewage effluent be poured into a sufficiently large volume of otherwise comparatively pure water, the dissolved organic matter contained in it disappears with remarkable rapidity ; in other words, the contact bed, instead of being composed of coke or other solid matter, is formed of water, in which the mysterious process of the reduction of the dissolved solids is carried on. . . ."

In the discussion which followed, Mr. Grigg, the Chairman of the Council, said the immensity of the problem of the sewage disposal of London awed those who heard Sir Alexander Binnie's figures.

Mr. Addiscott (Plymouth) inquired whether there was not a great manurial value in the sludge, which would render it profitable for disposal to farmers ?

Mr. Humphreys (Reigate) asked how London stood with regard to trade refuse being allowed to pass into the sewers ?

Mr. Lindley (Batley) mentioned that in his town they had come to the conclusion that bacterial filtration was the best plan.

Mr. McMahon (Torquay) explained that at Torquay the sewage was carried into the English Channel by an intercepting sewer, 100 ft. below the sea level.

Mr. Young (Battersea) declared that a great many of the present difficulties might be remedied by increasing the size of the flushing tanks from two to three gallons in residences. He ventured to think that this might be done if the water supply were municipalised.

Sir Alexander Binnie, replying to questions, said it was true that there was originally a manurial value in the sludge, but after treatment it did not seem to have any attractions for farmers. In fact, at one time the latter, rather than pay for the sludge, required the Public Authority to pay them 1s. a ton for removal. Oil refineries seriously interfered with the sewers by the quantity of refuse they discharged into them.

Mr. W. H. Grigg then read a paper prepared by Professor Frank Clowes, Chemical Adviser to the London County Council, on "The General and Experimental Treatment of the Sewage of the Metropolis at the Outfalls of the London County Council." For many years (he stated) the London County Council had conducted experiments upon a small portion of their sewage flow, with the object of ascertaining to what extent the quality of the sewage effluent discharged into the river could be improved by substituting bacterial treatment for treatment by chemical sedimentation. The effluent from chemical sedimentation contains much dissolved impurity, which rapidly undergoes offensive changes at summer heat, and which deprives the river water of much of its dissolved oxygen. It may be stated generally that the effluent resulting from the bacterial treatment of the screened sewage successively in a septic tank and in intermittently fed coke-beds is entirely free from this objection. The Professor then described the result of experimental bacterial treatment in coke-beds, mentioning that raw sewage, which had been deprived of its larger particles by screening it through coarse gratings, lost practically the whole of its suspended matter by remaining in such a coke bacteria-bed for two or three hours. It appeared that the suspended particles of fæcal matter underwent liquefaction by the bacteria, and did not collect upon the surface of the coke. The sand and grit and finer mud, arising mainly from the wear of road surfaces, however, were deposited upon the coke surfaces, and gradually reduced the capacity of the coke-bed. Hair, fibrous matter, and woody fibre, derived from the wear of wooden street pavements, and particles of chaff and straw, mainly derived from the dejecta of horses employed in the street traffic, were also deposited upon the coke surfaces and gradually choke the coke-bed. These substances, which consisted mainly of cellulose, were apparently only acted upon by bacteria with extreme slowness under these conditions. They arrived, however, in a water-logged condition, and rapidly settled down from the sewage if its rate of flow was reduced.

The total number of bacteria underwent some reduction in the coke-beds, but the different kinds of bacteria which were present in the sewage were still represented in the effluents. The introduction of such a sewage effluent into the Lower Thames appears (continued Professor Clowes) to be unobjectionable. The river water at this part is uniformly muddy ; it is always brackish and frequently salt to taste, owing to the presence of tidal sea water. It is, therefore, not capable of being used for drinking purposes, and the introduction of bacteria could not lead to danger arising from the river water being drunk. The effluent will certainly cause no deposit upon the river-bed, and will ordinarily tend to render the muddy river water more clear by mixing with it. No offensive smell can be emitted by the effluent as it is discharged, and the bacteria which it contains slowly and inoffensively remove the remaining

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dissolved organic matter from the effluent after it has been introduced into the river. The effluent will be suitable for the maintenance in the river of healthy fish-life.

Recent experiments have shown that if the roughly-screened sewage is made to pass with continuous flow through a settling tank, with constant surface level, and the flow is so regulated that a unit of sewage takes about five hours to pass through the tank, a fairly clear effluent suitable for coke-bed treatment is obtained. Under these conditions about 25 per cent. of the sediment or "sludge" in the settling tank disappears by bacterial action.

Sir James Crichton Browne then read a paper dealing with tuberculosis, and urged that the disease should be made compulsorily notifiable. He recognised that a great deal of good was already being done by a system of voluntary notification in some towns. Much depended upon the conscientious performance of their duty by sanitary inspectors to secure cleanly and sanitary milkshops and cowsheds which, he pointed out, could by neglect be made the source of much disease. The learned gentleman also dealt with Dr. Koch's views on the disputed point as to the contagion following bovine tuberculosis, and concluded by appealing to sanitary inspectors to use their best endeavours to rid the land of the worst scourge of humanity.

After a short discussion, a resolution was, on the motion of the President, adopted calling upon the Government to appoint a commission to inquire into the question of the contagiousness of bovine tuberculosis.

Mr. E. Tidman, the hon. secretary, mentioned that he had undertaken to read a paper analysing and criticising the new by-laws of the London County Council dealing with house drainage. He had been unable, through pressure of other work, to complete his paper, but he indicated in a general way the defects which he detected in the by-laws.

A paper, prepared by Mr. Prim, late resident engineer of the Houses of Parliament, was brought up by Mr. Tidman. Mr. Prim dealt exhaustively with the system employed for ventilating, heating, cooling, draining, and lighting the legislative chambers. He pointed out that the total length of the building is 940 ft.; its principal front, that facing the river, being 880 ft. in length, 680 ft. of which forms the terrace. The enclosed area upon which it stands—viz., exclusive of Old Palace-yard, but including Westminster Hall—occupies 7¾ acres. The debating-chamber of the House of Peers has a floor area of 4,050 ft., while that of the House of Commons has only 3,060 ft.

The total number of persons occupying the chamber during the division which took place after the debate on the second reading of the Government of Ireland Bill, in 1886, was 905, and as the total capacity of the chamber is 165,000 cubic feet, only 182 cubic feet was on that occasion apportioned to each individual; but as really one million and a quarter cubic feet of air was passed through the chamber per hour, thereby changing the air every 8¼ minutes, the supply of air per individual was, at that rate, of 1,326 cubic feet per hour, or 22 cubic feet per minute. The minimum temperature of the chamber was 63 degrees, and the maximum 67 degrees during a sitting of nine hours' duration, while the out-door temperature ranged from 65 degrees at the commencement of the sitting to 59 degrees at the rising of the House. When, however, the out-of-doors temperature is high then an increased temperature is maintained indoors, whereby a chill consequent on the sudden fall in temperature of some 20 deg. or 25 deg. on entering the building may be avoided. During protracted sittings the temperature of the air is gradually raised as morning approaches, want of rest and fatigue causing a slower circulation, and consequently chillness. Those parties forming the relief parties, and who have had a night's rest, a bath, a breakfast, and possibly a short walk, on arriving at the House at 8 a.m., do not generally approve of the then temperature, but they are not entitled to the same consideration as those who have struggled through a long night, rendered more tiresome by frequent and, on such occasions, almost useless divisions. The volume of air supplied to the Debating Chamber is regulated according to the number of persons present, the minimum quantity being 20 cubic feet per minute for each individual, but on occasions of exceptional crowding and excitement as much as 30,000 cubic feet of air per minute have been passed through the chamber, or not less than 33 cubic feet per head, assuming a full attendance. The principal source from whence the air supply is drawn is from the river front of the building, where, from thirty-five openings, air ducts are distributed for the service of the libraries, committee-rooms, Commons refreshment and smoking rooms, several offices, and the Debating Chamber of the House of Commons. The air for the Debating Chamber is drawn by the action of a fan along a gallery, where, on passing through jets of water converted into fine spray or mist, mechanical impurities, such as soot or dust, are washed out; in hot weather, in addition to the cooling effects of these sprays, the air is also brought into contact with large blocks of ice, and is then drawn through a fan or propeller, the speed of which is regulated according to the external temperature, as well as the number of persons occupying the chamber. This fan is driven by means of an endless rope from a steam engine, which is placed at a distance so as to avoid both noise and smell, the not unusual accompaniments of an engine. After leaving the fan, the air which is now being propelled passes through a screen of large area; this screen, which is composed of scrim or canvas of a light, open, and fluffy texture, arrests the further progress of any dust or smut that may have escaped the washing process. The air in its onward course next arrives at the filter, when, should the weather be foggy, the air-ways used in clear weather are closed, and the whole of the incoming air, the presence of which is increased by accelerating the speed of the propeller, is forced successively through two layers of cotton wool, each layer having a thickness of 3 in. and an area of 1,000 superficial feet. Having passed through this filtering medium during thick weather, and around it when no fog exists, the air ascends through gratings in the roof of the vault and enters the warming chamber overhead.

The warming is effected by means of steam conveyed through small pipes upon which zinc plates are soldered, and are called batteries. The principle of the battery enables a large quantity of air to be raised in temperature to a moderate degree, while the promptitude with which the heat may be checked whenever a sudden influx of members takes place, either on the call of a division or on the rising of a popular speaker, renders the apparatus superior to any other system. Following the onward course of the incoming air, after receiving the necessary amount of warmth, it ascends into the equalising chamber, where heated currents arising direct from the batteries become absorbed by the general body of the air, which assumes an equable temperature throughout before entering the Debating Chamber overhead, into which it passes.

The floor of the chamber is composed of perforated cast-iron plates, covered with an open-meshed matting of whipeord; there are also numerous openings in the walls and fittings round the chamber. In order to avoid any chilling effect from the upward movement of the incoming air about the Members' feet, that portion of the floor immediately in front of the benches is composed of wood covered by rugs. The area of opening in the floor, and panels around the Chamber, is so large that no perceptible draught is felt. Special inlets for air are provided for the galleries all round the Chamber. The vitiated air is extracted through the ceiling, which is composed of a number of ornamental panels slightly raised above their framings so as to permit the outgoing air to pass freely away. Sixty-four of the panels in the centre of the ceiling are of glass, through which the light from an equal number of gas-burners overhead illuminates the chamber. The extraction-flues from these burners alone act as powerful ventilators, but in addition to these are two ventilating up-cast shafts, the principal one being in the Clock Tower, at the base of which a fire is maintained day and night throughout the year.

The ventilation of the House of Peers is effected entirely on the extraction system, by which the air from two adjacent courtyards is drawn through water sprays, canvas screens, and steam-heating batteries, as already described, after which the air ascends through an open perforated floor, covered with a hair cloth carpet, into the Debating Chamber, passes from thence through the ornamental fretwork of the ceiling, and is extracted by furnaces placed at the base of up-cast shafts, the principal one forming one of the angle turrets of the Victoria Tower.

The ventilation of the Commons dining-rooms, the serving-room, the kitchen, the principal smoking-room, and the bathroom is effected by fans or air propellers driven electrically.

The heating medium is steam, which is supplied from four boilers, each 28 ft. in length by 7 ft. in diameter, and having two furnaces. The cooling of the air is effected both by placing blocks of ice in the "intake," or gallery, through which the air is drawn, or by fine sprays of cold water, which, playing upon canvas screens, presents a large surface of cooling medium to the passing air, tending not only to cool, but also to cleanse and moisten it.

Dealing with the drainage system, Mr. Prim pointed out that the whole of the sewage, together with the drainage from the roofs and courtyards, which, on a rainfall of one-tenth of an inch, represents nearly 20,000 gallons, or 88 tons, gravitates through iron pipes into three reservoirs, called "ejectors," having a combined capacity of 1,200 gallons. As these "ejectors" become full in their turn, a pressure of air, generally of about 12 lbs. on the square inch, forces the sewage into the metropolitan sewer. The air employed for this purpose is supplied from compressors actuated by steam-engines placed at a considerable distance from these ejectors.

As to lighting, at present the number of electric lamps in use within the building is, he said, equivalent to upwards of 5,000 of 8 candle-power; but before the completion of the installation a further 3,000 lamps will be required. The signal light on the Clock Tower is illuminated by gas, and is one of Wigham's patent apparatus, similar in design to those used by the Board of Irish Lights for light-house illumination.

At the conclusion of the reading of papers the usual votes of thanks were passed.

COMPETITIONS.

ADDITIONS AND ALTERATIONS TO WORKHOUSE, HEREFORD. — The two twenty-five guinea premiums in the competition for the additions and alterations to this workhouse, which additions include new infirmary buildings and administration block, have been awarded to Mr. E. H. Lingen Barker, of Hereford, and Messrs. Wells & Anderson, of Swansea, both of whom have London offices. The other competitors were Mr. S. H. Eachus, of Wolverhampton, Mr. Arthur Marshall, of Nottingham, and Mr. R. I. McBeatte, of Manchester.

BOOKS RECEIVED.

RIPON, THE CATHEDRAL AND SEE. By Cecil Hallett, B.A. (London: George Bell & Sons)

SHELTER AND DISINFECTING STATION, HACKNEY —From the Report by Dr. J. King Warry, M.D., on the sanitary condition of the Hackney district, we learn that in the month of July, 1900, the Local Government Board was asked by the local authority of Hackney to give their consent to a loan being raised for the erection of a shelter, a new disinfecting station, and a caretaker's lodge. A local inquiry was held at the Hackney Town Hall, and the consent of the Board was given. The shelter consists of four entirely separated and furnished tenements of two rooms, with water-closet and bathroom to each. The disinfecting station is of good size, and the chamber receiving the infected goods is completely cut off from the chamber receiving the disinfected articles. It is provided with two Alliot & Paton's improved Washington Lyon's high-pressure steam disinfectors. In connection with the non-infected chamber is a small laundry, fitted with a washing-machine, a hydro (both to be worked by means of an electric motor), troughs, &c., and an ironing-room fitted with electric heated irons; also a drying-room. It was thought desirable to include in this block shelter for the vans used in the transport of articles to and from the station, and a two-stalled stable and loose box for the horses employed. It is intended to provide the disinfecting station with steam from the boilers of the dust destructor; but to provide against the contingency of a failure on the part of the destructor, an upright boiler has been provided in connexion with the disinfecting apparatus. The opportunity was also seized to erect bathroom accommodation and apparatus for the cleansing of persons and their clothes infested with vermin. This accommodation consists of a bathroom for males and one for females, properly furnished with apparatus for the disinfection of the infected clothing. The architects are Messrs. ordon & Gunton, Finsbury House, E.C.

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Illustrations.

BEDALES SCHOOL, PETERSFIELD.

THIS is a large private school, built for Mr. J. H. Badley, the headmaster, at Steep, near Petersfield. The illustration shows a view from the south-west. The south or main front is centred on the end of the Great Hall, with its stone mullioned window and large gable. To the eastward of the hall is the private wing containing the headmaster's house; to the westward the school-rooms, returning with a west wing, set at right angles to the front, to enclose a quadrangle, the northern side of which is further enclosed by the workshops, with studio and bookbindery over, and the fives courts, and the eastern by the central block containing servants' offices and bedrooms, the matron's room, storerooms, sick dormitories, and bathrooms, &c.

The basement of the school buildings, in the west wing, contains the heating chamber, a drying-room for clothes, boot rooms, &c. On the ground floor are, in the south building, the headmaster's study, music and class rooms, the masters' common room, bathrooms, and lavatories, and chemical and physical laboratories; the corridor connecting these and forming two sides of the glass roofed quadrangle, is an open cloister with a quadripartite vaulted ceiling.

On the first floor of the school buildings are the remaining class and music rooms, and the library, in the north-west angle. The corridor is an open arched loggia looking out upon the quadrangle.

On the second floor are the dormitories, the bathrooms, and the masters' bedrooms.

There are two more dormitories and one masters' room over the hall.

The buildings are of local red brick; the walls, where the brick is exposed, being built with cavities, and being elsewhere coated with fine rough-cast stucco. The roofs are covered with local red tiles. The great aim has been to admit as much light and air as possible.

The builders are Messrs. Holloway Bros., of London; the architect Mr. E. P. Warren.

The school is lighted by electricity, for which special plant is provided; and the water supply is obtained by an electrical pump.

"MUNSTEAD WOOD."

THIS house was built for Miss Jekyll by Mr. Thomas Underwood, of Dunsfold, Godalming, from the designs and under the directions of Mr. E. L. Lutyens.

The walls are built of local stone, the roofs covered with tiles, and the principal timbers, window frames, &c., are of English oak.

"TIGBOURNE COURT."

THIS building was erected for Mr. Edgar Horne. It is of local stone, with small cast bricks for mullions, &c. The roofs are covered with tiles.

The house is on a limited site, and is built on the road side, so as to give the maximum of garden ground on the south and east sides.

The architect is Mr. E. L. Lutyens; the builder, Mr. Maxey, of Reading; and the plumbing was carried out by Mr. Allen, of Eastbourne.

THE PALAZZA UGUCCIONI.

THE Palazza Uguccioni is situated in the Piazza della Signoria, Florence, and is an excellent example of Florid Renaissance architecture. It was designed in the sixteenth century by Mariotto di Zanobi Folfi.

D. MCKAY STODDART.

COLUMN, ST. MARK'S, VENICE.

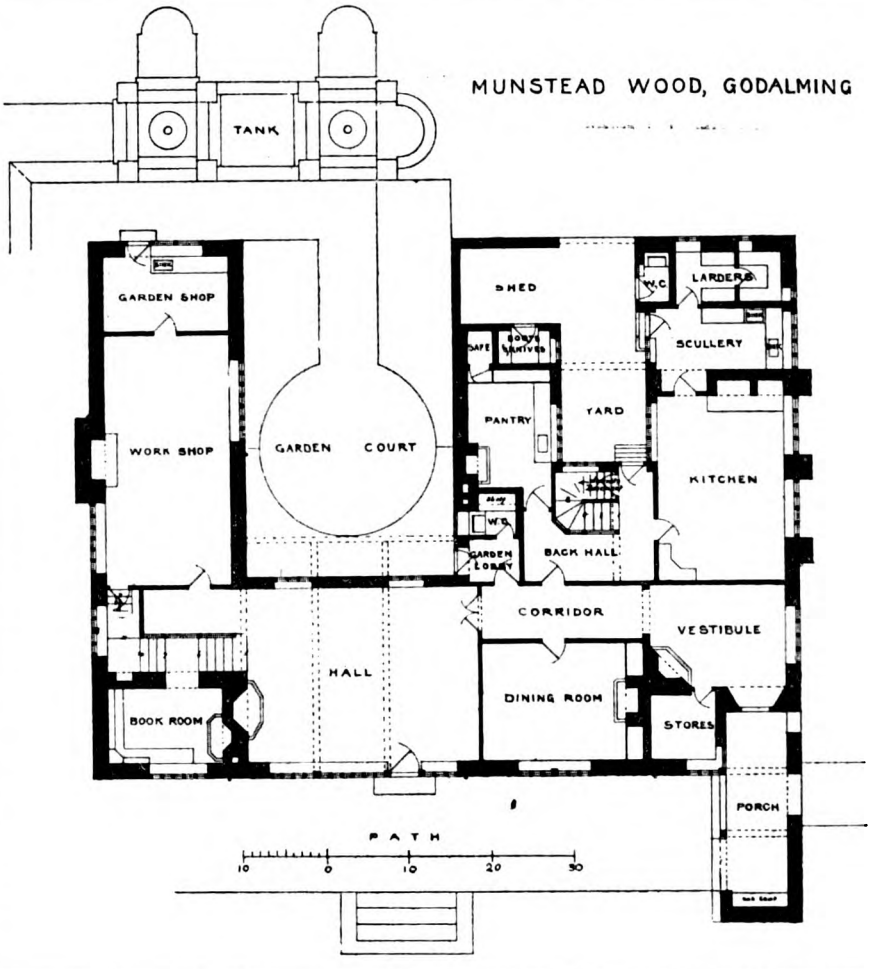
THIS is one of the two short square pilasters, with Greek monograms, at St. Mark's, in the Piazzetta. They are referred to in our leading article this week.

The cap is from the entrance-hall, or atrio, of St. Mark's. The drawings are by Mr. D. McKay Stoddart.

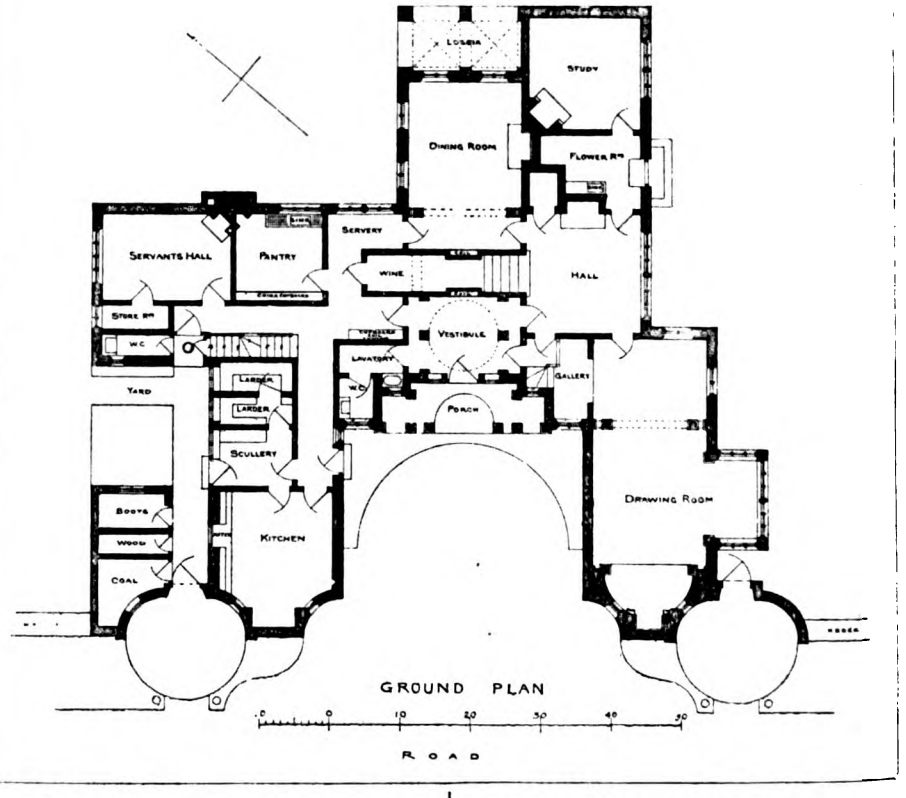
FORMBY GOLF CLUB HOUSE.

THIS design was submitted in a recent competition, limited to Liverpool architects, by Mr. James Strong. The view represents a plain treatment in cement pebble-dash, having a red brick base and tiled roof. The drawing was exhibited at the Royal Academy this year.

MUNSTEAD WOOD, GODALMING



TIGBOURNE COURT, WITLEY



THE PLYMOUTH ARMS, ST. FAGANS, GLAMORGANSHIRE.

THE Plymouth Arms is an old village hostelry near the entrance to the picturesque grounds of St. Fagan's Castle, the Glamorganshire residence of the Right Hon. Lord Windsor, to whose family the inn has belonged for many years.

The alterations were carried out some time ago by Mr. Edwin Seward, and in adapting the older house and adding to it, Lord Windsor used the opportunity to apply to it certain ideas as affecting public-house management, which have caused this work to be regarded with much interest, not alone within the immediate locality. It has been referred to as an instance of the "Gothenburg system" of utilising a licence, but although it is in many respects a model public-house properly supplying all the requisites of a place o refreshment under good management, its specialty relies rather on the principle which has recently been put into more general appli

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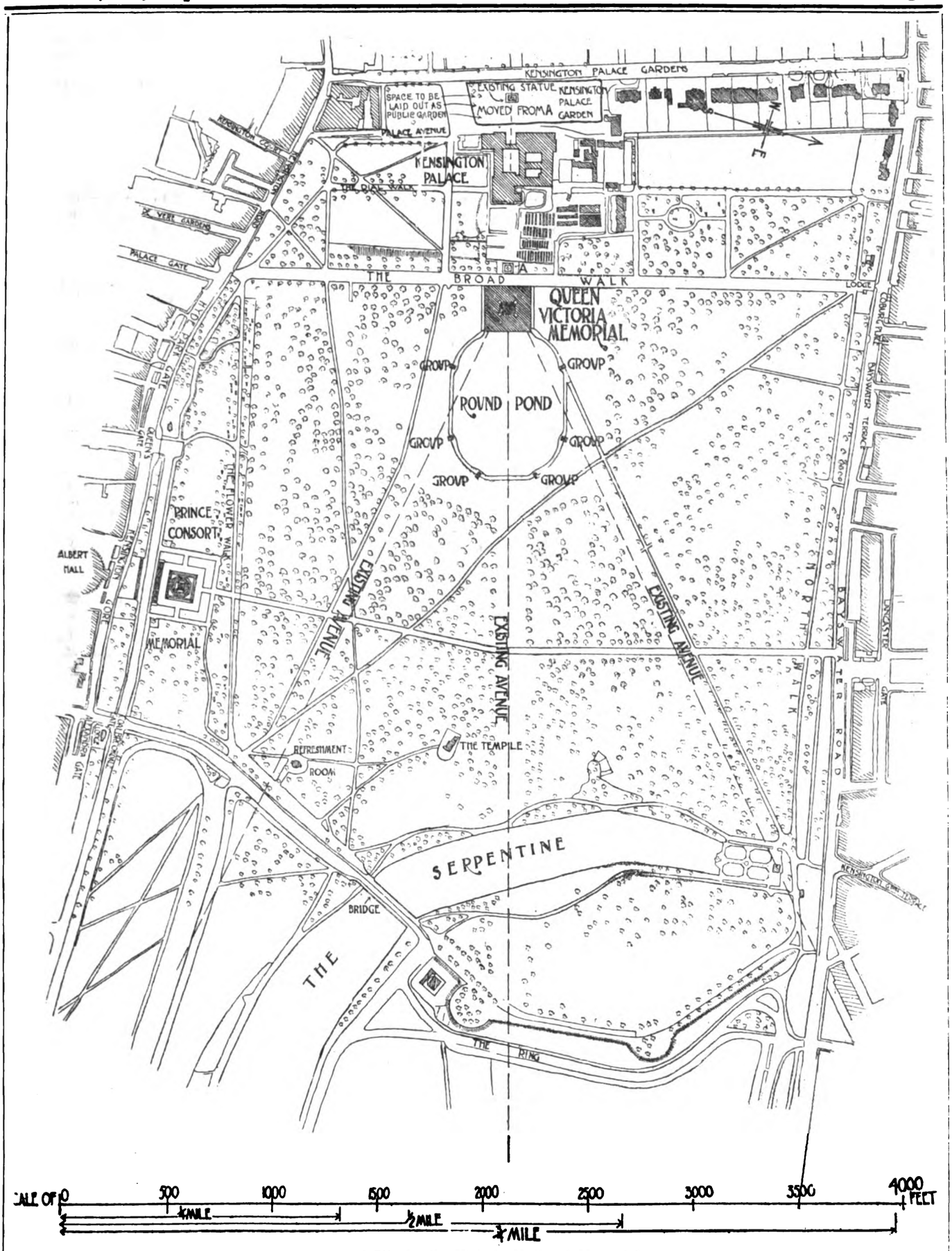

Proposed Site for the Victoria National Memorial.

cation by Lord Grey and his colleagues, in accordance with which the persons who conduct the business have no interest or advantage in the sale of intoxicants of any description. The planning arrangements are dependent on this, and the place altogether will always be interesting as one of the first instances in this country of an inn arranged to meet the requirements of a village public-house attractively, and with specialties as to construction and management which ensure that the business carried on is of a good class, usefully serving the neighbourhood, as distinct from providing the abnormal "facilities" which so often distinguish the public-house.

Correspondence.

To the Editor of THE BUILDER.

THE SITE FOR THE VICTORIA NATIONAL MEMORIAL.

SIR,—I have been urged, even at the eleventh hour, to bring under your notice an alternative site for the Victoria Memorial—on the elevated plateau in front of Kensington Palace—which about a month ago I ventured to suggest to an important member of the Memorial Committee. The accompanying plan, reduced from the Ordnance Sheet, shows the site in question. With its converging avenues, fine sheet of water, open space, and endless ornamental possibility—without the sacrifice of a single tree or altering in any way the present character of Kensington Gardens—this site is of unequalled importance and beauty. Further, its special fitness for the memorial to our late Queen rests on her having been born at Kensington Palace—where her toys are still preserved—while it was there she was told of her succession to the Throne. No such associations gather round Buckingham Palace. I am therefore not without hope that you may be induced to give the subscribers

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and the general public, as is just and right, an opportunity of judging as to the relative fitness of suggested sites for the National Memorial to our great Queen. WEMYSS.

Gosford, Longniddry,
August 22, 1901.

The Student's Column.

GAS AND GAS FITTINGS.

10.—LUMINOUS FLAT FLAMES.

TO obtain the highest lighting efficiency from a luminous flame the pressure under which the gas escapes at the point of ignition must be very low. The luminosity of the flame is due to the presence of minute particles of solid carbon liberated by the decomposition of certain hydrocarbons under the influence of heat. The greater the temperature to which the carbon particles are heated the greater is the intensity of the light emitted.

When gas issues under high pressure from the burner, less light is emitted from the flame than when the gas is burned under low pressure, because rapid currents of air are induced in the neighbourhood of the flame, which consequently becomes cooled and over aerated, and becomes less highly charged with the solid carbon particles.

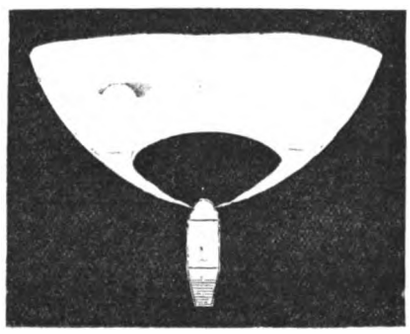

Fig. 18.—Batswing Burner and Flame.

The gas should issue from the burner in such a manner that the flame is capable of supplying itself with that proportion of air required to effect complete combustion of the gas without cooling the flame by undue dilution. If the flame is of such shape or dimensions that it cannot attract to itself sufficient air to completely oxidise all the carbon particles liberated, the flame becomes smoky and emits less light than when the gas is consumed under favourable conditions. A poor quality gas requires less air than a rich gas, and the apertures in a burner to consume the former should be larger than those in a burner for rich gas. A pressure of 0·5 in. at the inlet of the burner is sufficient in most cases.

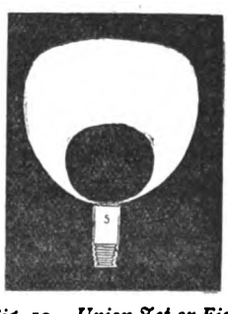

Fig. 19.—Union Jet or Fishtail Burner and Flame.

Flat flame burners may be divided into three classes:—(1) Batswing, (2) union-jet or fishtail, (3) slit union burners.

The burner tip should always be made of some material which is not a conductor of heat, the materials most extensively used being steatite and enamel.

Batswing Burners.—The batswing burner (fig. 18) yields a flame having a shape somewhat resembling that of a bat's wing. It is especially adapted for rich gas, such as that obtained from cannel coal, of from eighteen to thirty candle power.

The richer the gas the more narrow must be the slit in the burner, and the smaller the rate of consumption.

Union-jet or Fishtail Burner.—Bray's union-jet burner is an enamel burner cased in brass. The gas issues from two channels drilled in the enamel at an angle somewhat greater than 45 deg., the size of the orifices being dependent upon the quality of the gas to be consumed.

The burners range in size from No. ooooo to No. 9, the latter having the largest orifices. The inclination of the two channels in the enamel also varies according to the quality of the gas to be consumed, so that the angle at which the two jets of gas impinge against each other may be such as will give a suitable spread to the flame when supplied with gas under low pressure. The fishtail burner derives its name from the shape of the flame it gives. The flame being of less breadth than the batswing flame is less liable to crack the glass shades commonly used with flat flames. The light efficiency obtained when these burners are used with gas under the full pressure at which it is usually supplied to the consumer (say, 2 in.) is very low. The gas pressure ought to be reduced to about 0·5 in. before passing to the burner, but, as a matter of fact, the majority of gas consumers use Bray burners without a governor of any description, the sole regulation of the gas consumption being that produced by turning the gas cock until the flame appears to be emitting the maximum quantity of light.

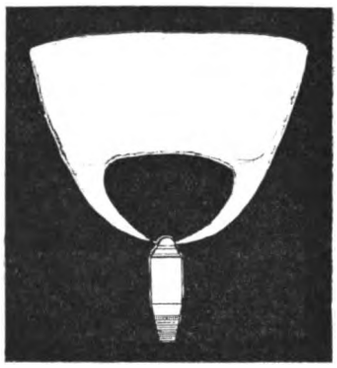

Fig. 21.—Slit Union Burner and Flame.

Bray Burners with Economisers.—The gas "economiser" is merely a small expansion chamber of brass, fitted internally with a muslin screen and terminating at top with a slit burner. These economisers slip over the ordinary Bray burner, and have the effect of materially increasing the illuminating power of the flame without affecting the rate of gas consumption. They are particularly effective when used in places not provided with governors, and supplied with gas under the usual pressure of 1½ to 2½ in. Bray's "Codac" economisers may be bought retail for a 1d. each, or 7d. per dozen, and although like all slit burners they gradually become blocked with carbonaceous deposit, their price is so small that they may be replaced by new ones every two or three months without appreciably affecting the annual cost of maintenance of a lighting installation. The Bray burners most extensively used are Nos. 4 and 5, consuming 8 and 10 cubic feet per hour respectively under the ordinary gas pressure. These may with advantage be replaced with No. 2 burners capped with No. 7 Codac economisers. When the economisers are discarded for new ones, it is not necessary also to renew the No. 2 burners.

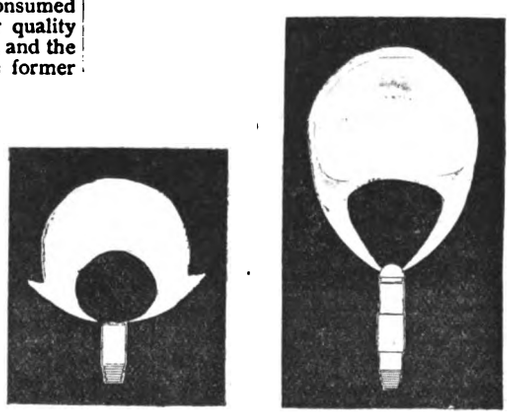

Fig 20.—Bray Burner with and without Economiser.

Bray's adjustable burners are constructed on similar lines, but the upper portion of the burner is made to screw on to the lower portion instead of to slip over it.

The following tables show the lighting power and rate of gas consumption obtained with a No. 2 and No. 3 Bray burner (patent enamel regulator) when tested under different gas pressures with and without the economiser, the gas cock in every case being turned fully open without regard to the appearance of the flame. The quality of the gas tested in a standard Argand burner was 15½ candles per 5 cubic feet per hour rate:—

No. 2 Bray Burner without Economiser.

Pressure of gas supply. Inches.	Gas Consumption. Cubic feet per hour.	Illuminating power. Candles.	Candles per cubic foot per hour. Candles.
1·75	5·6	1·4	0·25
1·00	4·1	1·7	0·41
0·50	2·5	1·2	0·48

No. 2 Bray Burner with No. 7 Codac Economiser.

1·75	5·6	16·6	2·96
1·00	4·1	9·6	2·34
0·50	2·5	4·8	1·92

No. 3 Bray Burner without Economiser.

1·75	6·75	4·0	0·59
1·00	4·70	3·8	0·80
0·50	3·00	3·0	1·00

No. 3 Bray Burner with No. 7 Codac Economiser.

1·75	6·75	18·0	2·66
1·00	4·70	11·4	2·42
0·50	3·00	6·6	2·20

The relative sizes of the flames obtained with a No. 2 Bray burner, with and without the No. 7 Economiser respectively, are shown in fig. 20. The rate of consumption under a pressure of 1·75 in. was 5·6 cubic ft. in each case, and the illuminating values were 1·4 and 16·6 candles respectively.

It will be observed that the lower the pressure the better the result when no economiser was used, but that when the burner was capped with the economiser the results improved as the pressure increased. The gas issuing from the economiser is under less pressure than when it issues from the orifices of the burner below it, and in every case the economiser increased the light efficiency of the gas. The light efficiency obtained when the Bray burners were used without an economiser would probably have been higher had the flow of gas to the burners been adjusted by turning the gas-cock until the flame appeared to be giving the maximum amount of light. Professor Lewes gives the following table of comparative duties of flat flame burners of different sizes tested with 16-candle gas, but the pressure of the gas is not stated, and the flames were probably always adjusted by turning the gas-cock until the brightest flame was obtained.

		Candles per cubic foot per hour.
Flat flame burner (without Economiser)	No. 0 ...	0·59
Ditto	1 ...	0·85
Ditto	2 ...	1·22
Ditto	3 ...	1·63
Ditto	4 ...	1·74
Ditto	5 ...	1·87
Ditto	6 ..	2·15
Ditto	7 ...	2·44

Slit Union Burners.—The slit union burner is a combination of the union-jet and batswing burner. It somewhat resembles the batswing burner in appearance, but has a recessed top, and produces a flame wider at the base than the batswing, and less ragged at its upper edges. These burners are often employed for street lamps.

Sugg's "Winsor" Burner is a flat flame burner, provided at the bottom of the burner chamber with a screw regulator, by means of which the gas consumption can be reduced to suit the gas pressure. Every variation in pressure necessitates a readjustment of the regulator, and these burners are therefore intended to be used where a governor is placed at the outlet of the meter.

Sugg's "Christiania" Burner is another flat flame burner provided with a self-acting governor with a screw on top of the gas

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chamber to regulate the consumption to any desired point.

Iron Burners.—Flat-flame burners constructed of iron are still used for flames exposed to the open air, as for stalls and the outside fronts of shops. They will stand rough usage from rain and wind better than the finer grade steatite or enamel burners, but the yield of light from them per unit of gas consumed is very low, and they also have the disadvantage of being liable to become blocked by rust.

[The diagrams of gas flames in this chapter, though not, of course, the actual size, are correct in their relative proportions.]

TRADES UNION CONGRESS.

THE annual meeting of the Trades Union Congress was opened in the Albert Hall, Swansea, on the 2nd inst, Mr. C. W. Bowerman presiding The Congress having been welcomed by the Mayor and others, Mr. S. Woods, Secretary, presented the Report of the Parliamentary Committee, which stated that since the last Congress several questions relating to the Workmen's Compensation Act had been before the Law Courts, and decisions in the Appeal Court had been challenged by the trade unions, taken to the House of Lords, and in every case reversed in the interests of the workers. It must be obvious to every one who had watched the proceedings of Parliament that it was useless to expect any active measures of industrial reform from the House of Commons, because, composed as it was at present, it was plain that any measure having for its object the improvement of the condition of the working classes, the strengthening of trade-union principles, or attacking existing monopolies was blocked by the dilatory proceeding of the House of Commons and the taking away of the opportunities of private Members by the Government, thus making it difficult to pass any progressive measure of labour reform. This was proved by the experience in successive Sessions with the Miners' Eight Hours Bill, and the Committee were of opinion that till these initial difficulties to legislation were removed, trade unions and the working classes of the country would always be hampered in their desire for progressive labour legislation. . . . . The one case that put every other in the trade-union movement in the shade was the remarkable decision of the House of Lords in the Taff Vale picketing appeal. During the last twenty years large sums of money had been spent by trade unions with the object of keeping intact and safeguarding trade union funds; especially had this been the case in connexion with some of the larger trades, because it was contended by all trade-union leaders that the real object and intention of the Trade Union Act was to give the fullest protection to these funds. . . . . This judgment was so far-reaching in its effect on the trade-union position and action that the Parliamentary Committee lost no time in placing the matter in the hands of their advising counsel, who had given the following opinion:—"The position of trade unions created by the judgment in the Taff Vale case is very serious. In my opinion, the funds of unregistered unions were equally liable with unions for damages caused by the illegal acts of persons acting as agents for and on behalf of those bodies. The seriousness of the judgment is because of the position of the law relating to picketing as laid down in the case of Lyons *v.* Wilkins. Under the judgment there it will be exceedingly difficult to conduct a strike with any degree of success without doing illegal acts. The consequence of these acts, if done, in the words of Lord Macnaghten, by persons who from their position might be taken fairly to represent that body, will be to render the funds of the society liable for the damage occasioned by such illegal acts. So that the first step to be taken, in my opinion, should be that the first case where an injunction is sought to restrain persons from picketing should be taken to the House of Lords under the authority of Congress or such persons as it would authorise so as to prevent possibility of anything happening similar to that in the case of Lyons *v.* Wilkins. I am also of opinion that the various unions should amend their rules so as to prevent as far as possible action being taken against unions now that they are sueable in their collective capacity. The last point referred to me for opinion is as to whether or not the unions under the judgment have obtained any benefit in the matter of being able to sue employers. I think there is a great advantage of being able to sue, say, a vindictive employer, who might try to break up or otherwise injure a union for his own benefit. If it can be shown that employers did such an act I should say that a good cause of action lay with the union against such an employer."

Mr. Bowerman delivered his inaugural address as President on Tuesday. The Congress afterwards proceeded to the consideration of the Parliamentary Committee's report.

Mr. Pete Curran (London) moved:—"That this Congress expresses its strong admiration at the courage and behaviour of the Bethesda quarrymen during their long and arduous struggle to free themselves from the trammels of serfdom and to establish the principle of combination, and further emphatically condemns those in authority who are responsible for the drafting of the military and police forces into that district, there being absolutely no ground for such unwarrantable action."

Mr. Brace (Monmouthshire Miners) seconded the resolution.

Mr. Moyses (London) moved an addition to the resolution recommending the societies represented at the Congress to contribute a sufficient regular income to the quarrymen so as to enable them to carry their struggle to a successful issue.

Mr. Sexton (Liverpool) seconded the addition, and the resolution, with the addition, was unanimously agreed to.

Mr. Steadman (London) moved that the standing orders should be suspended so that the Parliamentary Committee's recommendations on the Taff Vale case should be considered. These were that the Congress take a test case to the House of Lords to settle how far picketing may be carried out without infringing the law and rendering the funds of the societies liable for damages. The Committee further advised the establishment of a fund for the purpose of carrying this out, and also that each society should amend its rules to secure protection against some of the consequences of the House of Lords judgment in the Taff Vale case.

Mr. E. Browne, standing counsel to the Congress, explained the legal situation created by the decision of the House of Lords, and advised the delegates to agree to the recommendations of the Parliamentary Committee.

Mr. Galbraith (London) moved, and Mr. B. Turner (Batley) seconded, the resolution recommended by the Parliamentary Committee.

Mr. Baker (Stockton-on-Tees) moved as an addition "and urge each society to use their best endeavours to bring about such alteration in the law as will meet with the approval of this Congress."

Mr. R. Bell, M.P. (Secretary of the Railway Servants' Society), said they had no doubt all been startled by the announcement in the papers that an action for 20,000*l.* had been entered against his society. He could not go fully into the subject, as the case was *sub judice*. The present position was that there had been an argument before the Master of the Rolls with regard to the venue of the trial. The railway company wanted it in London, and the Railway Servants' Society wanted it in Glamorganshire. The Master of the Rolls had reserved his decision until after the Long Vacation. In his (Mr. Bell's) opinion, it was hopeless for the unions ever to get back the *status quo* that existed before the decision of the House of Lords. What they must do, however, was to secure an amendment of the Trades Union Act so as to protect all funds for a benevolent purpose.

Mr. Sexton (Liverpool) said that no man could have expected any other decision than that given by the House of Lords if he looked at the matter from an equitable point of view.

The president announced that the Parliamentary Committee were quite willing to accept the proposed addition.

The discussion was continued on Wednesday, when recommendations of the Parliamentary Committee were agreed to.

Resolutions were agreed to advocating the amendment of the Factory and Workshops Act in the following particulars:—By the appointment of inspectors in building trades; by the prohibition of women and young girls working overtime; and by raising the working age limit for children to fifteen.

A motion by Mr. B. Tillett in favour of the establishment of compulsory arbitration was defeated.

OBITUARY.

MR. BENNETT.—We regret to announce the death, on August 21, of Mr. Robert Isaac Bennett, of No. 17, Cooper-street, Manchester, partner of the firm of Messrs. Royle & Bennett, of that city. Mr. Bennett was elected a Fellow of the Royal Institute of British Architects in 1888, of which he was a member of the Council; he was also President during a long period of the Manchester Society of Architects. The firm of Messrs. Royle & Bennett planned and designed many schools and other buildings for the Manchester School Board, amongst them being the Moston-lane Board Schools, the offices at Deansgate, and the Higher Grade Schools at Cheetham. They also designed the block of warehouses and shops at the corner of Mount-street and Lloyd-street, and carried out the recent improvements of the approach into Albert-square, Manchester. He and his partner, Mr. A. Royle, had been employed in an adjudicatory capacity in respect of several important competitions—including those for the Constabulary Offices at Warrington, the Heaton Norris District Council public offices; the Accrington-road, Blackburn, Board Schools; and, a few months ago, the St. Matthias Schools, for the Salford School Board.

MR. C. DORMAN.—We regret to record the death of Mr. Charles Dorman, senior member of the firm of Messrs. Dorman & Son, architects and surveyors, Abington-street, Northampton, which took place at his residence early on Sunday morning. Mr. Dorman, who came to Northampton from Uppingham, started business in Northampton in 1882, and in 1897 he took his son into partnership with him. Prominent buildings, especially in Northampton, have been built from his designs. Mr. Dorman was sixty-three years of age, and leaves a widow with five daughters and one son—Mr. C. H. Dorman—who will carry on the business.

GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, SWINTON.—On the 29th ult. a new Congregational church, erected at a cost of about 2,200*l.*, was formally opened at Swinton. The architects were Messrs. Hemsoll & Paterson, of Sheffield, whilst the contract was let to Mr. Miles N. Brown, of Mexboro'. The building is faced with Mexboro' "rocky" stone. The windows are of leaded coloured glass by Messrs. Jeffrey & Foster, of Sheffield. The accommodation is for 500 persons, including a gallery at one end of the building.

CONGREGATIONAL CHURCH, BLACKPOOL.—A new Congregational chapel has just been opened in Warley-road, North Shore, Blackpool. This chapel has cost 5,000*l.*, and the land another 1,000*l.* It was built by the Mayor, Alderman T. H. Smith, from the designs of Messrs. Anderson, Symond, & Crawford, architects, of Edinburgh.

THE HIPPODROME, BRIGHTON.—A large building has been erected in Middle-street, Brighton, on the site of the late Ice Skating Rink, from the plans of Mr. F. Matcham, of London. The work has been carried out by Messrs. Griffith & Co., London.

COLLEGE OF DOMESTIC SCIENCE, LIVERPOOL.—A building has been erected on a site at the junction of Seel-street and Colquitt-street, Liverpool, for the School of Cookery. The entire scheme—land, buildings, furnishings, &c.—will cost upwards of 10,000*l.* The new college, which has been built from designs prepared by Messrs. Pain and Charles Blease, architects, Liverpool, will include all the different departments now carried on in separate buildings.

THE "CENTURY" THEATRE.—The old Adelphi Theatre in the Strand has been remodelled and renamed. The stage of the old "Adelphi" is left practically intact, but the auditorium, approaches, &c., have been rearranged, and included in the new structure is an adjoining property on the western side, enabling the architects to provide a more spacious crushroom, with managerial offices in addition, besides giving an opportunity for revising the approaches to the stalls. A subway now leads from the main entrance and crushroom to both prompt and O P. sides of this part of the house. Centrally situate in the crushroom is the main staircase leading to the foyer and dress circle, with its lounge and saloon, together with the ante-rooms. The Adam style of decoration has been the keynote of the architectural treatment. Considerable improvement has been effected in the auditorium. The private boxes are on the stalls and dress circle level only, eight in all. On the upper circle, in lieu of boxes, the seats have been continued around to the proscenium opening in the stalls. There are upwards of 200 seats. The pit is one of the largest in London; it has a refreshment saloon and emergency exits. The prevailing scheme of decoration is ivory white, yellow, old gold, and electric blue, developed in silk, velvet, and mural coverings and paintings. The stage was unusually large in the old days, and has been somewhat curtailed by the erection of dressing-rooms on the stage-level for the use of the principal artistes. In all there are twenty-four dressing-rooms. The heating is on the low-pressure system. There is a complete installation of electric light, with gas as a stand-by. Westward the elevation has been extended in keeping with the old façade, and a new glazed shelter has been provided over the principal approaches. The whole of the scheme for the reconstruction of the theatre has been prepared by Messrs. Ernest Runtz & Co., architects, of Walbrook, E.C.; and all the details of the plastic decoration, and the decorations themselves, have been designed by them. Mr. Frank Kirk was the contractor. The Florentine frieze over the proscenium was executed by Mr. Charles Buchel. Messrs. Maple & Co. were entrusted with the furnishing. Amongst other firms engaged are the following:—Electric installations, Vaughan & Brown; heating, &c., Vaughan & Brown; fireproof curtains and hydrants, Merryweather & Sons; act drop, Charles Hemsley; stained glass, Prest & Co.; sanitary arrangements, Barton. The whole of the decorative scheme has been carried out by Mr. Edward Bell, Castle-road, Kentish Town. The proscenium opening is 30 ft. by 31 ft.; the stage is 64 ft. wide and 87 ft. deep, extending back to Maiden-lane; the height of flies from stage 28 ft. 6 in.; the distance between fly-rails 46 ft.; the auditorium is 56 ft. wide and 77 ft. deep from curtain line; there are over 200 stalls, 170 dress circle seats, 250 upper circle seats, and the gallery and pit are very large; the crush room is 33 ft. long by 20 ft. wide, and the foyer 44 ft 6 in. long by 18 ft. wide, with deep columniated recesses at either end.

THE OLD HOLBORN WORKHOUSE.—The old workhouse, near the western end of Clerkenwell

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road, at the junction with Rosebery-avenue, is about to be pulled down. The site will be occupied by a block of casual wards in Little Gray's Inn-lane, which the Guardians of the Holborn Union are about to erect, after plans and designs prepared by Messrs. Smith & Coggin. The present building is one of the last of its kind that has remained in London

THE ST. HELEN'S TOWN HALL-SQUARE.—The work of re-arranging the property in front of the St. Helen's Town Hall, and clearing a space of about 4,000 square yards, in order to form an open space in front of the Town Hall and Gamble Institute, is, it is stated, being pushed on rapidly. Messrs. Briggs & Wolstenholme, the architects, have arranged a line of buildings in harmony with the building in which the free library and technical schools are housed. Immediately the disturbed parties are settled in their new premises, Mr. Joseph Ellison, the builder, who is carrying out the work, will have the new space cleared and the square finished as rapidly as possible.

THE BUILDING TRADE IN SHEFFIELD. — It is a matter of common knowledge that during 1899 and 1900 there was abnormal activity in the building trade of Sheffield, all parts of the city, and principally, of course, the suburbs, being affected. As a matter of fact, 2,616 new houses within the city boundaries were certified as fit for occupation during the former year, whilst during the succeeding twelve months the total rose to 2,797. An opinion seems now to prevail that a slump in the local building trade is inevitable at no distant date. The facts supporting such a contention are difficult to find. It is perfectly true that (as already stated) the number of houses erected in recent years has largely increased, but the real question to be considered is whether more houses have been built than were required to meet the demands of a growing population. On this point nothing could be more significant or conclusive than one fact: The percentage of losses on the district rate in consequence of houses being unoccupied was lower during the twelve months ended March 25 last than for any similar period during the last ten years. That the supply of housing accommodation has not exceeded the demand is further proved by the readiness with which owners of newly-completed houses are able to find occupiers. In most districts of the city at the present time there is such a demand that builders and owners have considerable difficulty in keeping their property free of tenants till it is properly inspected and certified as fit for occupation, whilst any one known to have houses to let is besieged by applicants.—*Sheffield Independent.*

SANITARY AND ENGINEERING NEWS.

DOCK, BURNTISLAND, FIFESHIRE.—The new deep water dock at Burntisland was opened on the 23rd ult. Its area is about 12 acres, which is twice the dimensions of the old basin; it is fitted with three hoists, each of which is expected to load about 400 tons an hour. The south wall of the dock is pitched, and from the slope a timber jetty is brought forward, on which the third hoist has been erected. Unlike the old dock, which is equal sided, the new basin is oblong in shape, extending to 1,270 ft. in length by 554 ft. broad at the widest part. Much of the reclaimed ground extending east from the dock quays to the Lammerlaws has not yet been levelled. It will afford storage room for waggons of coal waiting shipment. Temporary means of lighting the dock will be employed pending the installation of the electric light, which has been decided on as the illuminant. The engineers of the new dock were Messrs. P. W. Meek, Urquhart, and R. Henderson, and the contractors Sir John Jackson (Limited), with Messrs. H. C. Wynne Edwards and A. Whitley as local managers. Sir William Armstrong & Co., of Newcastle, have supplied the dock gates, hoists, and hydraulic machinery.

SEWERAGE DISPOSAL, BAILDON, YORKS.—The Urban District Council of Baildon has accepted the tender of Mr. Wm. Brigg, of Frizinghall, Bradford, at 11,900*l.* for works of sewerage and sewage disposal, for the districts of Baildon Wood Bottom, Baildon Green, Lower Holme, and Low Hill, and the works are to be proceeded with immediately. The engineers to the scheme are Messrs. Beesley, Son & Nichols, Westminster.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —The Pulsometer Engineering Company, Limited, have removed their works and offices from Nine Elms, S.W., to Nine Elms Ironworks, Reading, Berks. All communications should now be addressed to Reading, though the company are retaining their offices and showroom at Queen Victoria-street, E.C.

VOLUNTEERS' HEADQUARTERS.—It is announced that the War Office authorities have approved of a site in Whitecross-place, Shoreditch, for the erection thereon of new headquarters for the 3rd London Rifle Volunteers.

LONDON BRIDGE.—The Royal Assent having been given to the measure introduced last session by the Corporation of London, the work of widening the bridge will, we gather, be soon proceeded with. The plans and designs have been prepared by Mr. Andrew Murray, the City Surveyor, in conjunction with Mr. Cruttwell, Resident Engineer of the Tower Bridge. They provide for a widening of the structure from 53 ft. to 65 ft., the additional width—nearly 6 ft.—of each footpath being supported by granite corbels or shoulder-pieces, which will be bolted on to the main fabric of the bridge with steel work. A balustrade will replace the present stone wall on either side, and it is calculated that the increased weight to be laid upon the foundations will not exceed 67 lbs. to the square foot. It is estimated that the cost will amount to about 100,000*l.*

THE GLASGOW SCHOOL OF ART.—We have received the Prospectus and Prize Scheme of this school for session 1901-1902, the autumn term of which commenced on September 5. The work of the school is divided into four departments: (1) Drawing and Painting; (2) Architecture; (3) Modelling; (4) Design and Decoration. Courses of studies are arranged in groups for each of these departments. These courses are for the training of students as painters of landscape and the figure, architects, modellers, sculptors, designers and decorative artists, art masters and mistresses. Architect students learn the elements of construction; the nature of materials and the mechanics of architecture; draw from the cast; study the historical development of architecture in Europe; acquire a knowledge of the principles and growth of ornament; measure and sketch buildings and receive instruction in architectural design. Concurrently with this, they study drawing and modelling from the antique and life, and attend the lectures on ornamental design; anatomy and proportion and figure design and decoration. They are specially prepared for the examinations of the Royal Institute of British Architects. There is a museum of casts, containing examples of figure and ornament from the Classic, the Gothic, the Renaissance, and later styles. A large addition of casts—figure and ornament—was made last session. The casts are arranged under the heads of the various historic styles. Where possible, photographs are being added, showing the ornament or figure in its place in the building. The school reference library contains over 1,400 volumes of works on architecture, the graphic and the decorative and applied arts, together with portfolios of prints, drawings, and photographs. A collection of lantern slides for lecture purposes is being formed, and embraces an historical series of each of the following architectural styles:—(1) Greek, (2) Roman, (3) English Gothic, (4) Italian Renaissance, (5) French Renaissance, (6) English domestic work, (7) Scottish work. The reading-room is always open, and is free to all students of the school. A school museum of applied art is also a feature in the school building. A set of workshops fitted with the necessary appliances for dealing with designs in the material has been specially built. These fittings include kilns, muffles, stoves, and other appliances, so that students may carry their works to a completion. The subjects dealt with are stained glass, decoration of interiors, needlework, bookbinding, ceramic decoration, enamels, block cutting, mosaics, sgraffitto, gesso, lithographic design, posters, &c., metal work, wood carving, stone carving, furniture. The headmaster of the school is Mr. Francis H. Newbery. In the architectural section Mr. Alex M'Gibbon, A.R.I.B.A., is the director, and he and the following gentlemen are the instructors: Messrs. W. R. Watson, James Smith, and John Dunlop. The architectural classes have also the advantage of architect visitors.

THE NORTHAMPTON INSTITUTE, CLERKENWELL.—At the Northampton Institute (City Polytechnic), St. John-street-road, E.C., the arrangements have been completed for the educational course for the season 1901-1902. The aim of the Northampton Institute is to provide classes in Technological and Trade Subjects, and to this end attention is paid first to the immediate requirements of Clerkenwell. The educational courses fall into two distinct sections. The Engineering Day Courses for students who are willing to give the whole of their time for one, two, or more years to a thorough and systematic training in one of the branches of engineering dealt with, and the Evening Courses and Classes, which are provided for the needs of those who, on account of being engaged during the day, or for any other cause, are unable to devote the whole of their time to attendance at day courses. In the Artistic Crafts Department the subjects undertaken are those which will be serviceable to jewellers, gold and silversmiths, diamond mounters, engravers, chasers, decorative metal workers, modellers, and workers in plaster; wood, stone, and marble carvers; painters and decorators; sign writers, marblers, and grainers. In addition to the ordinary drawing and design classes held every evening, special courses have been arranged for those engaged in the gold and silversmiths, jewellery, decorative metal work, electric light fitting, building, and wood working trades. In each of these sections workshops are provided, fully equipped for carrying on practical work in the various branches of the trades, and open every evening to enable students to practise. In all classes students receive instruction in the design as well as in the practical work of their trades; short courses of lectures dealing with the artistic and technical characteristics of the various subjects will be given during the Session. The courses arranged for those engaged in the building trades are in conjunction with the lecture and practical classes in the Mechanical Engineering Department. These courses will deal with the architectural and decorative branches of the subjects and the artistic treatment of stone, wood, plaster, and similar materials used in the construction of buildings. A collection of casts, books, and photographs of examples of architectural ornament has been made, and will be further added to from time to time. It includes examples of ornament of all periods. Actual specimens of artistic handicraft productions will also be procured to illustrate special characteristics of work, and historical periods and styles. The following are the sections under which the various classes are held: mechanical engineering and metal trades; artistic crafts; electrical engineering and applied physics; technical chemistry; horological; miscellaneous trades; and domestic economy and women's trades. Judging from the book of "announcements" which has been sent us, very thorough work is being done at this institution.

THE DISMISSAL OF THE SURVEYOR OF FULHAM. —A meeting called to protest against the dismissal of the Surveyor of Fulham (Mr. Chas. Botterill) by the Borough Council was held at Fulham Town Hall on Tuesday night. Councillor McArthur moved a resolution protesting against the arbitrary and unjust action of the small majority of the members of the Council in dismissing, without reason, Mr. Botterill, A.M.Inst.C.E., after sixteen years' faithful service, placing on record their appreciation of his business abilities and courteous manner in the discharge of his duties, in the initiation and completion of the many important improvements made from time to time in the borough, and assuring him of the fact that he still retained the confidence of the general body of ratepayers. Mr. Stuart Barker seconded the resolution, and Councillors Cooney and Scriven having spoken, the resolution was put to the meeting and declared by the Chairman to be carried by the majority of the ratepayers present.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

8,239.—ENERGY AND QUANTITY METERS (ELECTRICITY): *Siemens and Halske, A. G.*—The conductor of an induction motor meter travels between laminated iron cores that are wound with coils that convey alternating currents in different phases and with closed circuits. In the inner cylindrical core are recesses rendered adjustable with an arm in engagement with screws in order that they may be placed near opposite poles of the core, so as to compensate for errors due to friction or other causes, without affecting the fields of one pair of poles. Round holes near the edge of the core may replace the recesses, and the main or a proportional current may be carried by the coils on the poles.

8,247.—ATTACHMENT OF HANDLES AND KNOBS: *H. W. Grove.*—The neck of the knob is pierced with holes or slots for a staple that will engage with a slot cut in the spindle when the knob has been put in its place, the head and ends of the staple being taken by grooves in the neck of the knob; in another form a split collar is used instead of a staple and holes are made through the knob and spindle.

8,265.—CONSUMPTION OF SMOKE: *C. H. Bryant, A. C. Rassler, F. M. Mitchell, and G. T. Augspurg.*—The invention is intended to deflect the gases downwards into the furnace where they may consume the smoke after they have been caused to circulate in the shape of a hollow tube as they flow upwards; within the chimney is placed a metal cylinder of which the two spiral guides are tapered downwards, and above it is a canopy divided into convoluted partitions which are shallow around their circumferences and deep around their centres, the vanes being produced down the shaft or cylinder to a short distance from the furnace.

8,275.—A SANITARY APPLIANCE: *W. Martin.*—Around the top of a commode is fashioned a trough to be filled with water for which a hanging flange forms a trap; the flange of the cover will dip into the water between it and the side of the container, and whenever the latter is inverted the seal may be perfected from a reservoir underneath.

8,289-90.—ELECTRICAL CONDUCTORS: *G. E. Heyl-Dia.*—For covering insulated or bare conductors they are passed, together with two strips of the insulating material, between grooved rollers of which the flanges are set so as to join together, without severing, the strips (the outside edges excepted) of the material. The rollers may have cutting edges that will divide the cables during the process of covering. 8,290.—In the case of multiple conductors the rollers will separate and re-cover them and a spacing-piece is placed between the conductors, a ridge being fashioned upon the upper roller which will make a groove into which nails or other fastenings can be inserted.

8,309.—MANUFACTURE OF GLASS: *H. E. Knospel.* —For the manufacture of glass containing calcium phosphate, so as to be opaque and coloured, the fluxes employed instead of potassium carbonate consist of barium or barium compounds, namely, carbonate, chlorate, hydrate, nitrate, sulphate, or oxide.

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8,376.—ROTARY ROCK DRILLS: *W. George.*—A twisted bar, having an I-section, constitutes the drill, and at its cutting-end are left thickened edges by the removal of a portion of the web. For driving purposes may be employed either a hand-crank with bevel gearing, or a motor, mounted upon the frame to which a crutch and a handle are attached.

8,394.—A CONTRIVANCE FOR STARTING SIPHONS: *T. G. Rhodes and R. Gaunt.*—A piston having a middle rod is fitted within a piston-starting cylinder, an opening for the admission of the flush being formed by the cutting away of a part of the screwed cap. The piston can be removed, without disturbance of the cap, by means of a slot which is cut in the latter.

8,409.—MAKING OF CEMENTS, &c.: *G. Warren.*—The slurry for plaster of Paris, cement, and so on, is cast in moulds having movable partitions, and of which the contents are dried upon a drying-floor or upon the roof of the kiln, after which the goods are taken out of the moulds and fired in the kiln. In order to reduce the space above the bricks, the arches of the kiln are flattened. An injecting-apparatus for liquid fuel may be advantageously used with the kiln, for which confer Nos. 9,607 and 24,946 of 1894.

8,410.—APPARATUS FOR WEIRS: *C. Fohr.*—The inventor furnishes means of directing to an overflow weir all materials that might clog a sluice or other portion of a canal or a similar conduit or channel; of two pairs of parallel and horizontal bars carried upon piles, one pair is disposed at the bottom and the other pair over the level of the water, and an intermediate pair of bars may be used upon occasion. Angle-iron brackets are fastened within the bars, and upon them are arranged, in the shape of a Venetian blind, a series of flat vertical bars. By another arrangement lugs, on to which the vertical bars are pivoted, are substituted for the brackets, by which means a relative displacement of the parallel bars horizontally will cause the vertical bars to turn about their axes.

8,419.—A FRAME FOR USE BY ARTISTS: *F. W. Schiller.*—The frame, to be used for painting upon canvas, is made (by preference) of aluminium, a cord is passed around the rollers of the frame, and also around loose rollers to which hooks are fastened, the hooks being secured in eyelets made in the canvas. A winding-roller, fitted with a handle, serves for the tightening of the cord.

8,433.—MATERIALS FOR USE IN INCANDESCENT LAMPS: *F. Dannert.*—For making a homogeneous conductive lighting body the inventor moulds and heats a plastic paste of sucrate of lime or some other chemical compound, which when carbonised will produce definite parts of carbon and a metallic oxide, whilst the ratio of resultant carbon can be reduced by adding to the material a concentrated solution of some inorganic metallic salt.

8,484.—SLABS FOR FLOORING PURPOSES: *F. Woas.*—Subsidiary draining-grooves are fashioned in the slabs, and are set to run into main diagonal channels which are laid with a slight incline.

8,518.—SOLDERING ALUMINIUM GOODS: *Y. Novel.*—For metal goods that have been firstly tinned are used an ordinary solder and a copper bit, with a flux, for tinning, composed of stearic acid 5 parts, resin 2 parts, and oleic acid 1 part; or else stearic acid 3 parts, and resin 1 part. For soldering purposes should be used stearic acid 1 part, and oleic acid 10 parts. The two fluxes are stated to be available for both purposes.

8,548.—PIPE AND TAP COUPLINGS: *G. Rydill.*—The socket for a tap or pipe outlet is fitted with indiarubber packing and a strainer. A nut that is screwed into the socket, and compresses the packing around the pipe, takes the nozzle. By another arrangement, a screwed cap may replace the nut, or the socket may be screwed on the outlet of a plug-cock.

8,609.—A HOLDER FOR USE IN SHARPENING TOOLS: *L. Lowndes.*—The holder, in which chisels, plane-irons, &c., can be clamped, has handles and an arm, of which the roller will run the tool upon the bench so as to maintain a uniform degree of inclination of the blade to the oil-stone.

8,633.—TILES FOR ROOFS: *G. Kistner.*—Under the lower edges of the tiles are fashioned ribs that will fit into recesses cut in the upper faces of the tiles next adjacent, and there are deeper ribs that will bear against the upper edges. The tiles, which are to be jointed with cement, have hanging ribs, feathers, and interlocking ribs, and raised ornamentations.

8,637.—FASTENINGS FOR WINDOW-SASHES, ELEVATOR-DOORS, &c.: *H. G. Carleton.*—A pivoted hook or catch is pressed forwards with a spring into engagement with a rack upon the sliding sash, which may thus be fastened at various positions. A cam-surface presses the catch back on to a magnet when the sash is closed. When the circuit is completed the magnet has sufficient strength to hold the catch back against the action of a spring, whereupon one can open the window; but if one tries to open the window when the circuit is broken, an alarm circuit will be closed through the drawing of the catch upwards by the rack-teeth, which causes a pin to touch a spring.

8,652.—A VENTILATOR FOR LARGE BUILDINGS: *C. F. Seward and H. G. Walton.*—Air outlets are formed in or near the roof so as to leave the spars untouched, and the openings are provided with shutters which consist of swinging flaps having hooked supports at their upper ends, so that they will become closed through their own weight; the shutters, however, may be closed by other means, such as rods fastened obliquely to rods that can be moved lengthwise, or bell-crank levers and rock-shafts.

8,659.—APPARATUS FOR CLEANING FLUES, TUBES, &c: *W. H. Ingersoll.*—A jet of steam is forced into the flue and so sets up a current of air within it; the egg-shaped head or nozzle of the steam-pipe will serve for scraping the interior of the flue. In another form of the cleaner its conical head is placed within an air-chamber formed by a sleeve upon a disc which engages with the head whereby air will be discharged around the flue and will mix with the middle jet of steam. Confer also No. 1,368 of 1900.

8,667.—APPLIANCE FOR USE IN EXTINCTEURS: *E. F. Steck.*—The invention concerns the mounting of the acid bottle in an extincteur. A metallic casing for the bottle is pivoted with two pins on to the cap of the receiver, which can therefore be turned backwards after it has been removed for the filling of the bottle. The falling out of the bottle upon an inversion of the extincteur is prevented by the bending inwards of one of the hangers of the bottles, whilst the turning of the case upon the pivots, when inverted, is prevented by the friction of the end of the other hanger. The stopper of the bottle will fall out, and so allow the acid and alkaline solution to become mixed, when the extincteur is inverted.

8,670.—A GUARD FOR CLOSET SEATS: *L. Spelkens.*—A sheet of paper is drawn over the opening of the seat from a pair of rollers behind it by means of spur-gearing which is driven by a pawl and a pivoted arm grooved for the working of a pin upon the side of the lid of the seat, which is hinged. The used paper is gathered around a roller and a cutting edge fitted underneath the lid cuts out a suitably-sized piece of paper whenever the lid is turned downwards.

8,680.—A SAFETY VALVE FOR HYDRAULIC CRANES AND SIMILAR MACHINES: *H. Berry.*—In order that the rams shall not return with an accidental falling of the pressure in the mains, the inventor joins the spindle of the valve in the supply-passage to a ram that works in a chamber placed in communication with the main; a reduction of the pressure will effect the closing of the valve by the pressure through the supply-passage from the principal cylinders and that of a spring which is set within an extension from the valve, and is rendered adjustable by means of a screw which is passed through a removable capping; the valve in the supply-passage may be opened for the exhausting of the water or other fluid by a supplementary valve, which is joined on to the main at a point beyond the main valves, so as to regulate the amount of supply to the chamber which contains the ram already mentioned.

MEETINGS.

SATURDAY, SEPTEMBER 7.

Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection at Morden Hall Dairy Farm, Morden, Surrey. 3 p.m.

MONDAY, SEPTEMBER 9.

Clerks of Works Association (Carpenters' Hall, London Wall).—Monthly meeting. 7.30.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. W. Marriott, F.R.Met.Soc., on "Meteorology." 7 p.m.

WEDNESDAY, SEPTEMBER 11.

Institute of Sanitary Engineers.—Examination and Literary Committee at 3.0 p.m. General Purposes and Finance Committee at 4.0 p.m. Opening Sessional Meeting at 7.0 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley, M.D., on "Sanitary Law." I. 7 p.m.

FRIDAY, SEPTEMBER 13.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley, M.D., on "Sanitary Law." II. 7 p.m.

SATURDAY, SEPTEMBER 14.

Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection at Southwark and Vauxhall Waterworks, Hampton. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 3.—By J. HOWELL THOMAS & SON (at Carmarthen).

Llanstephan, Carmarthen.—The Cottage and 24 a. 3 r. 7 p., f. £3,200
Orchard House and 7 a. 0 r. 17 p., f. 1,000
Church House, f. 360
Underhill Cottage, u.t. 52 yrs., g.r. 3*l.* 200
Pilrhoth, Tirbach, Maesgwyn, Tynewydd, Darkway, Park-Cnwc, Trehiddion, and Tygwynne Farms, 505 a. 1 r. 27 p., f. 20,050
Llangunnock, Carmarthen.—Penplas and Llanygorse Farms, 125 a. 0 r. 6 p., f. 1,925
Trelech-ar-Bettws, Carmarthen.—Cilhir-issa Farm, 110 a. 1 r. 30 p., f. 1,400
Carmarthen, Carmarthen. — Lammas-st., City House, f., r. 50*l.* 860

August 20.—By H. F. RUSSELL & SON (at Kington).

Almeley, Hereford. — Spearmarsh House and Windless Cottage and 12 a. 3 r. 6 p., f. 1,475

August 21.—By THOMAS MARTIN & SON (at Exeter).

Ide, Devonshire —Pole House and 7½ a., f. £1,300

August 22.—By T. W. GAZE & SON (at Stowmarket).

Cotton, Suffolk.—The Hill Farm, 205 a. 3 r. 4 p., f. 1,940

By EDWIN J. GILDERS (at Thorpe-le-Soken).

Thorpe-le-Soken, Essex. — Four cottages and enclosure, 7 a. 1 r. 17 p., c. 460
High-st, three houses (two with shops), f. 235

August 27.—By FRITH, GARLAND & CO.

Tottenham —King's Cliff Villas, f.g.r.'s 65*l.*, reversion in 99 yrs. 1,630
4, 6, 8, 16, 18, 20, 22 and 48, Drayton-rd., u.t. 98 yrs., g.r. 44*l.* 2,050

August 28.—By F. ELLEN & SON.

Houghton, Hants. — Houghton Down Estate, 411 a. 3 r. 17 p., f. 4,000
Kingsomborne, Hants.—Teg Down Farm, 137 a. 2 r. 36 p., f. 1,400
Stockbridge, Hants.—Lower Sandy Down Farm, 200 a. 3 r. 38 p., f. 1,750

August 29.—By JOHN BOTT & SONS.

Peckham.—71, Rye Hill Park, u.t. 65 yrs., g.r. 8*l.* 8s., e.r. 40*l.* 360

By STIMSON & SONS.

Camberwell.—93, 95, and 109, Southampton-st., f., r. 102*l.* 1,240
97, Avenue-rd., u.t. 48 yrs., g.r. 3*l.* 10s., e.r. 32*l.* 355
Old Ford.—77 to 87 (odd), Monier-rd., u.t. 72½ yrs., g.r. 3*l.* 695
Commercial-rd., East.—107, Brook-st., f. 455
Wood Green.—4 to 10 (even), High-rd., u.t. 61 yrs., g.r. 19*l.* 4s., r. 172*l.* 1,800
Norwood.—Beulah Spa-ter., f.g. rents 27*l.*, reversions in 95 and 97 yrs. 600
16 and 17, Beulah Spa-ter., f. 500
Beulah Spa-ter., plot of land, f. 250
Notting Hill.—37 to 43 (odd), Princes-rd., u.t. 42 yrs., g.r. 24*l.* 1,000

By DOUGLAS YOUNG & CO. (on the estate)

Finchley. — Stanhope-av., &c., 73 freehold building sites 9,100

August 30.—By ROBERT NEWMAN.

Regent's Park.—83, Upper Gloucester-pl., and 48, Huntsworth-mews, u.t. 19½ yrs., g.r. 16*l.* 16s., r. 119*l.* 550

By A. J. SHEFFIELD.

Spitalfields.—50 and 52, Brushfield-st., u.t. 20½ yrs., g.r. 120*l.*, r. 292*l.* 860
Tottenham.—1, 6 to 9, Hartington-ter., u.t. 61 yrs., g.r. 19*l.* 10s., r. 131*l.* 665

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000 alongside, in river.	
Rough Stocks and Grizzles	1 11 0	"	" "
Facing Stocks	2 12 0	"	" "
Shippers	2 8 0	"	" "
Flettons	1 8 6	"	at railway depôt.
Red Wire Cuts	1 14 6	"	" "
Best Fareham Red	3 11 0	"	" "
Best Red pressed Ruabon Facing	5 5 0	"	" "
Best Blue Pressed Staffordshire	4 4 6	"	" "
Do., Bullnose	4 9 0	"	" "
Best Stourbridge Fire Bricks	4 2 6	"	" "
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	"	" "
Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats	17 0 0	"	" "
Double Stretchers	19 0 0	"	" "
Double Headers	16 0 0	"	"
One Side and two Ends	19 0 0	"	" "
Two Sides and one End	20 0 0	"	" "
Splays, Chamfered, Squints	20 0 0	"	" "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats	14 0 0	"	" "
Double Stretchers	15 0 0	"	" "
Double Headers	14 0 0	"	" "
One Side and two Ends	15 0 0	"	" "
Two Sides and one End	15 0 0	"	" "
plays, Chamfered, Squints	14 0 0	"	" "
Seconds Quality White and Dipped Salt Glazed	8 0 0	"	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	34 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. 0d. per ton at rly. dpt.

[*See also page 221.*

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Sinking Well	Malling Union	The Clerk, Workhouse, West Malling	Sept. 10
Tall Chimneys	Manchester Corporation	C. S. Allott & Son, Engineers, 46, Brown-street, Manchester	do.
Bridge Works, Ulverston	Lancashire County Council	County Bridgemaster, Preston	do.
Stable, Lawrence Hill, Bristol	Great Western Railway Company.	G. K. Mills, Paddington Station, W.	do.
Road Works	Barking U.D.C.	C. F. Dawson, Surveyor, Public Offices, Barking	do.
Quartzite (200 tons)	Christchurch Town Council	E. J. Legg, Surveyor, Town Hall, Christchurch	do.
Warehouse, King-street	Glasgow Corporation	M'Kissack & Sons, Architects, 68, West Regent-street, Glasgow	do.
Coastguard Station, Kilkeel, co. Down	Office of Works	A. Ferguson, Donegall-square West, Belfast	do.
Cemetery Works	New Wortley Burial Board	H. Williams, Board Room, New Wortley, Leeds	do.
Two Footbridges	Normanton (Yorks) U.D.C.	C. B. L. Fernandes, Council Offices, Normanton	do.
Wrought-iron Railings	Gosport U.D.C.	H. Frost, Surveyor, Town Hall, Gosport	Sept. 11
Sewerage Works	Godstone R.D.C.	T. C. Barralet, Surveyor, New Oxted	do.
Street Works	Todmorden Corporation	C. R. Pease, Engineer, Town Hall, Todmorden	do.
Additions to Schools, near Newbury	...	W. H. Bell, Architect, Market Place, Newbury	do.
Swimming Bath	Norton (Yorks) U.D.C.	W. Botterill, Council Buildings, Norton	do.
Chimney Stack, &c.	Stoke-on-Trent Guardians	Mr. Lynam, Architect, Stoke-on-Trent	do.
House & Shop, Tantobie, Durham	Miss Laidler	G. T. Wilson, Architect, 121, Durham-road, Blackhill	do.
30 Houses, Dewe-road	Brighton Town Council	F. J. C. May, Civil Engineer, Town Hall, Brighton	Sept. 12
Electrical Works Station	Bristol Corporation	H. F. Proctor, Engineer, Temple Back, Bristol	do.
Homes, Langho, near Blackburn	Lancashire County Council	H. Littler, Architect, County Offices, Preston	do.
Footbridge, Anton River	Andover R.D.C.	J. Wormald, Surveyor, South Cottage, Andover	do.
Church, Alexander-road, Penzance	...	Rev. M. May, Finland House, Penzance	do.
Outfall Sewer	Weymouth Corporation	W. B. Morgan, Engineer, Weymouth	do.
Boundary Walls, &c., Blaydon	Winlaton School Board	W. Scott, 28, Mary-street, Blaydon	do.
Two Shops, West Vale, Halifax	...	Walsh & Nicholas, Architects, Halifax	do.
Billiard Room, &c., Ilkley	...	Hope & Son, Architects, 23, Bank-street, Bradford	do.
School, Tycroes	Llanedy School Board	J. Davies & Son, Architects, Cowell House, Llanelly	Sept. 13
School, Canterbury-road	Colchester School Board	Goodey & Cressall, Architects, Colchester	do.
Additions to Cottages, Trowbridge-road	...	J. Rubie, Castle Hotel, Bath	do.
Shed, Ovenden, Yorks	...	Walsh & Nicholas, Architects, Halifax	do.
Business Premises, near Sunderland	Hetton Downs Co-op. Society	W. & T. R. Milburn, Architects, 20, Fawcett-street, Sunderland	Sept. 14
Business Premises, Llanfairfechan	Mr. W. Eames	R. Davies, Architect, 125, High-street, Bangor	do.
Sewer	Maldon (Essex) R.D.C.	H. G. Heywood, Civil Engineer, Maldon	do.
Street Works, Springfield	Chelmsford R.D.C.	H. G. Warne, Surveyor, Avenue Chambers, Chelmsford	do.
Road Widening, Newlands	Cockermouth R.D.C.	J. B. Wilson, Civil Engineer, Court Buildings, Cockermouth	do.
Police Station, Patterdale, Westmorland	...	J. Bentley, Surveyor, 7, Lowther-street, Kendal	do.
Houses, The Shore	Perth Town Council	R. M'Killop, Surveyor, Perth	do.
Pipes (750 tons)	Glasgow Corporation	J. M. Gale, Engineer, 45, John-street, Glasgow	do.
Farm Buildings, Flookburgh, Lancs	Miss Seath	C. P. Chambers, 34, Cornwallis-street, Barrow	do.
*Mortuary Buildings and Chapel	Paddington Metropolitan Borough	Surveyor's Department, Town Hall, Paddington	Sept. 16
178 Cottages, &c., Caeracca, Dowlais	...	W. Dowdeswell, Architect, Treharris	do.
Additions to Inn, Crumlin, Mon.	Messrs. Webb & Co.	R. L. Roberts, Architect, Abercorn	do.
Two Cottages, Marston Green	Birmingham Guardians	Whitwell & Sons, Architects, 23, Temple-row, Birmingham	do.
School, Northumberland-road	Newcastle Town Council	J. W. Dyson, Architect, 67, Grey-street, Newcastle	do.
Two Houses, Pontlottyn	...	W. Davies, Architect, Pontlottyn	do.
Asylum Works, Kirkburton, Yorks	West Riding County Council	J. V. Edwards, Surveyor, Wakefield	do.
Additions to Schools	Houghton Regis School Board	Brown & Son, Architects, Luton	do.
*Wood Paving Carriageways	London Corporation	The Engineer, Guildhall	Sept. 17
*Alterations to Underground Convenience	do.	do.	do.
*Asphalte Paving Works	do.	do.	do.
Road Works	Croydon Town Council	E. Mawdesley, Town Hall, Croydon	do.
Road Works, George-road	Amble U.D.C.	W. Gibson, Surveyor, 31, Queen-street, Amble	do.
Water Main, Wellwood-street	do.	do.	do.
*Wood Paving	Willesden District Council	O. Claude Robson, Public Offices, Dyne-road, Kilburn	do.
*New Harbour Offices	Swansea Harbour Trust	Harbour Offices, Swansea	Sept. 18
*Casual Wards, Gray's Inn-road	Holborn Union	W. Mellor, 17, Buckingham-street, Adelphi, W.C.	do.
*Road Works	Wimbledon U.D.C.	C. H. Cooper, Esq., Council Offices, The Broadway, Wimbledon	do.
*Making-up Roads	Chiswick U.D.C.	Surveyor of Council, Town Hall, Chiswick	do.
Wood Paving, Central Station, Newcastle	North-Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne	do.
*Extension of Kitchen Accommodation	Lambeth Guardians	Woodward & Brooks, Architects, 69, Kennington-oval, S.E.	do.
*Slop Vans, &c.	Woolwich Metropolitan Borough	F. Sumner, Borough Engineer, Maxey-road, Plumstead	Sept. 19
Rebuilding Hotel, Kirkmichael, N.B.	...	J. Sim, Architect, Montrose	do.
Steel Rails (5,000 tons)	British Electric Traction Co., Ltd.	Engineer, Donington House, Norfolk-street, W.C.	Sept. 20
Gasworks	Buxton Town Council	H. Barker, Engineer, Town Hall, Buxton	Sept. 21
Public Offices, &c.	Ince-in-Makerfield U.D.C.	Heaton & Co., Architects, Wigan	do.
*Pulling Down and Clearing Site	Bermondsey Borough Council	Borough Surveyor, Town Hall, Spa-road, Bermondsey, S.E.	Sept. 23
*Kerbing, Channelling, &c., St. Ann's-road	Tottenham U.D.C.	Engineer to Council, Offices, 712, High-road, Tottenham	Sept. 24
*Mortuary Buildings, &c.	Poplar, &c., Sick Asylum District	Messrs. J. & S. F. Clarkson, 136, High-street, Poplar, E.	do.
*Cookery Room, Fencing, and Partitions	Walthamstow School Board	H. Prosser, Architect, School Board Offices, Walthamstow	do.
*Electricity Works	Willesden District Council	O. Claude Robson, Public Offices, Dyne-road, Kilburn	do.
*Underground Convenience, Forest Gate	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	do.
*Making-up Streets	do.	do.	do.
*Painting Work at Hospital, Dagenham	do.	do.	do.
Pumping Engines	Middlesbrough Town Council	F. Baker, Civil Engineer, Municipal Buildings, Middlesbrough	Sept. 25
*Timber Staith	Gateshead County Borough	Borough Engineer, Town Hall, Gateshead	Sept. 26
*Wall	Lewisham Metropolitan Borough	Surveyor, Town Hall, Catford	do.
*Iron Fencing, carriage paid	do.	do.	do.
*Water Works, &c.	Strutton and Bude U.D.C.	Baldwin Latham, Parliament Mansions, Victoria-st., Westminster	do.
*New Coast Guard Buildings, Whitstable	Admiralty	Coast Guard Station, Whitstable	Sept. 27
Pumping Machinery	Leicester Corporation	E. G. Mawbey, Civil Engineer, Town Hall, Leicester	Oct. 1
*Mortuary	Woolwich Metropolitan Borough	F. Sumner, Borough Engineer, Maxey-road, Plumstead	Oct. 3
*Cottages, Totterdown Fields, Tooting	London County Council	Architect's Department, 18, Pall-mall East, S.W.	Oct. 8
Harbour Improvements, Annalong	Down County Council	County Surveyor, Court House, Downpatrick	Oct. 19
Villa, Biggar, N.B.	...	J. R. & E. Pearson, Architects, 27, Castle-street, Edinburgh	No date
Additions to Schools, Chester	...	J. H. Davies & Sons, Architects, Newgate-street, Chester	do.
*House, Canons' Park Estate, Edgware	...	H. M. Lawson, Architect, 40, The Broadway, Ealing, W.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Hackney Union	3*l.* 3*s.* per week	Sept. 11
*Assistant Examiner in Patent Office	Civil Service Commission	Not stated	Sept. 19
*Clerk of Works	Carlisle, &c., Co-op. Society, Ltd.	Not stated	Sept. 21
*Manual Training Instructors in Woodwork	School Board for London	100*l.* per annum	Sept. 26
*Clerk of Works	Midland Counties Idiot Asylum	Not stated	No date
*Clerk of Works	Gillingham & Grange U.D.Sch.Bd.	3*l.* 3*s.* per week	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. —.* *Contracts, pp. iv. vi. viii. x. & xx.* *Public Appointments, pp. xviii. & xx.*

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PRICES CURRENT (*Continued*).

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath "	1 7	" "
Farleigh Down Bath	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks	2 2½	" "
Red Corsehill "	2 3	" "
Red Mansfield "	2 4½	" "
Hard York in blocks	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt
" " 6 in. Rubbed Ditto	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" " 2 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt
" " " 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3-in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep.
" best seconds "	10 15 0	" "
16× 8 best "	6 2 6	" "
20×10 best blue Portmadoc	10 18 0	" "
16× 8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green	11 2 6	" "
16× 8 " "	6 15 0	" "
20×10 Permanent green	10 0 0	" "
16× 8 " "	5 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	4 1 6	per 1,000 at rly. depôt
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	4 8 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	37 6	per 1,000 " "
Do. ornamental Do.	60 0	" "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" "
Best Red or Mottled Staffordshire Do. (Peakes)	30 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	more than battens.

	At per load of 50 ft.	
Fir timber: Best middling Dansig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 18 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
" " 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	15 0 0	16 0 0
" " " 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
" " " 3 in. by 9 in.	13 0 0	14 0 0
" " battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine— First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Dansig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	" "

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

	Per square	
Prepared Flooring— 1 in. by 7 in. yellow, planed and shot	0 13 6	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 14 0	0 16 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders " "	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
" " galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 17 6	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0½	- - -
Thin "	0 1 2	- - -
Copper nails "	0 1 2	- - -
BRASS— Strong Sheet "	0 0 11	- - -
Thin "	0 1 1	- - -
TIN—English Ingots "	0 1 4½	- - -
SOLDER—Plumbers' "	0 0 7	- - -
Tinmen's "	0 0 8	- - -
Blowpipe "	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 0	per ton delivered.
Fine "	38 0	" "
Superfine "	42 0	" "
Coarse Keenes and Parian cement	55 0	" "
Fine do. do.	60 0	" "
Robinson's Fireproof Cement	50 0	" "
Do. Fine white, finishing (Exclusive of the ordinary charge for sacks.	55 0	" "
Whiting	27 0 to	30 0 " "
Cow hair for plastering	£9 0 0	" "

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
" " fourths	2¾d.	" "
21 oz. thirds	3¾d.	" "
" " fourths	3½d.	" "
26 oz. thirds	5d.	" "
" " fourths	4½d.	" "
32 oz. thirds	6d.	" "
" " fourths	5½d.	" "
Fluted sheet, 15 oz.	3½d.	" "
" " 21 "	4½d.	" "
½ Hartley's Rolled Plate	3d.	" "
⅜ " " "	3½d.	" "
¼ " "	4d.	" "

PRICES R

LS, &c.

	£ s. d	
Raw Linseed Oil in pipes	per gallon	0 2 10
" " " in barrels		0 2 11
" " " in drums	"	0 3 1
Boiled " in pipes	"	0 3 0
" " " in barrels		0 3 1
" " " in drums	"	0 3 3
Turpentine, in barrels	"	0 2 3
" in drums	"	0 2 5
Genuine Ground English White Lead	per ton	22 0 0
Red Lead, Dry	"	22 10 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 18 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

H. W. (Below our limit.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BLAYDON.—For rebuilding the Black Ball Inn, for the trustees of the late Robert Newton. Mr. A. Gibson Kyle, architect, 1, St. Nicholas Buildings, Newcastle. Quantities by the architect:—

Ross & Son	£2,091 16 0	Woodall & Wilson	£1,818 10 8
Thompson & Co.	2,015 6 6	Armstrong	1,685 3 8
Elliott Bros.	1,880 2 9	H. & B. Arkless, Gateshead*	1,649 16 9
Hunting & George	1,857 13 11		

BRANKSOME.—For the execution of road works, Cromer, Station, and Cardigan roads, for the Urban District Council. Mr. S. J. Newman, Surveyor, Council Buildings, Branksome:—

S. Saunders	£928 15 3	Grounds & Newton	£688 0 0
G. Maidment	785 11 2	H. C. Brixey, Branksome*	683 11 5
G. T. Budden	752 7 3		

BRISTOL.—For the erection of sanitary annexe at Stapleton Workhouse, Bristol, for the Guardians of the Poor of the City and County of Bristol. Mr. F. W. Brock, architect, St. Peter's Hospital, Bristol. Quantities by the architect:—

F. Wall	£980	M. Durnford	£847
Foster	945	J. Browning	845
Daltry & Son	930	E. Clark, Fishponds, Bristol*	795
Gorvett	882	I. Hatherly	763
A. Dowling	863		

[Architect's estimate, £806.]

CARDIFF.—For the erection of a school, Whitchurch, for the School Board. Messrs. R. & S. Williams, architects, Wharton-street, Cardiff. Quantities by architects:—

J. E. Evans	£4,800 0 0	G. Griffiths	£4,445 0 0
H. Gibbon	4 770 0 0	C. Dunn	4,440 0 0
James Allan	4,739 0 0	Evans & Bros.	4,345 10 0
F. Small	4,700 0 0	Couzens & Co.	4,296 18 0
David Davies	4,610 0 0	Thomas & Co.	4,227 0 0
E. Williams	4,555 9 8	Thomas Bevan	4,195 8 0
Turner & Sons	4,488 0 0	W. T. Morgan, Cardiff*	4,045 0 0
Cox & Bardo	4,466 4 0		

CLEVEDON (Somerset).—For the erection of main buildings, boiler-house, and chimney-stack, for Clevedon Steam Laundry Company. Mr. T. J. Moss-Flower, C.E., engineer, 2, Victoria Mansions, Westminster, S.W., and Baldwin-street, Bristol:—

W. A. Green, Clevedon* £1,845

See also next page.

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EDMONTON.—For building three new water-closets and erecting fence, walls, and iron railings at Millfield House Schools Silver-street, Upper Edmonton, for the Guardians of the Strand Union. Mr. A. A. Kekwick, architect, 18 and 19, Outer Temple, Strand :—

Pollard & Brand	£533	T. G. Sharpington, Nunhead*	£355
J. Pavey	469	Colton & Co.	275
A. Monk	415		
H. C. Horswill	405		

EDMONTON.—For sundry alterations at the workhouse, Silver-street, Upper Edmonton, for the Guardians of the Strand Union. Mr. A. A. Kekwick, architect, 18 and 19, Outer Temple, Strand :—

Finch & Co.	£1,083	A. H. Inns	£725
Love & Co.	1,065	R. P. Beattie, Victoria-street*	675
Dent & Hellyer	995	Stapleton & Sons	669
Doulton & Co.	914	Strange & Sons	618
F. H. Miller	907	H. C. Horswill	530
Lighting Corporation	887	Davis & Bennett	512
W. H. Tilley	792		

ERITH.—For Roman Catholic Monastery :—

Goddard & Sons	£5,032	Minter	£4,825
Longley & Son	4,989	Ennes Bros., Erith*	4,600

HUNSLET.—For the construction of settling tanks, filters, &c., for the Rural District Council. Messrs. Marriott, Son, & Shaw, engineers, Dewsbury :—
John Leightley, Carlton, Wakefield £260 3

LECHLADE.—For alterations and additions to the Swan Hotel, Lechlade, Gloucestershire, for Messrs. R. B. Bowby & Co., Limited, Swindon. Messrs. William Drew & Sons, architects, Swindon :—
Joseph Williams, Swindon* £384 10 6

LEYTON.—For the erection of a block of school buildings, to be known as the Farmers-road Schools, for the Leyton School Board. Mr. William Jacques, architect, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Sons :—

Watts, Johnson, & Co.	£30,914	W. J. Maddison	£28,094
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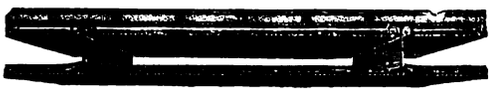

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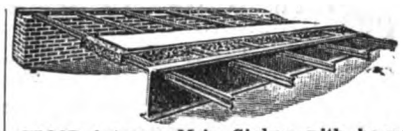

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The Vaulting of the Crypt of Glasgow Cathedral.

Of the many beautiful examples of thirteenth century work which survive to us in England and Scotland none is more successful in design, more original in plan and elevation, and more beset with archæological difficulties than the double choir of Glasgow Cathedral. In his new book Mr. Watson* has gone far, if not finally to dispel ancient illusions and misconceptions, at any rate to provide copious material for a full elucidation of the growth and uprearing of this remarkable work. He has provided seventy-eight illustrations, some of them measured drawings, some photographs, others coloured plans, by the aid of which it is possible to test the theories proposed by himself and others. His own theory, first propounded in 1886, has not yet made converts of other experts. Messrs. MacGibbon and Ross, in the third edition of their work on the "Ecclesiastical Architecture of Scotland," withdraw the modified approval which they had expressed in previous editions. Mr. Thomas Ross, in the third Rhind lecture, delivered in 1900, says, "Probably the original plan of the crypt is the plan we see to-day." Mr. John Honeyman, in the "Book of Glasgow Cathedral," retains his opinion that in the crypt we have the original design. All this is naturally very disheartening to the author of a theory. Nevertheless, we think that it hardly justifies Mr. Watson in asserting that "a change of design in the middle compartment of the crypt is not within the range of intelligent controversy." This is perilously close to bad language; and it is unnecessary, for Mr. Watson has a strong case. It may be stated as follows:

What documentary evidence there is as to the building of the present cathedral, as is only too often the case, is conflicting and misleading. Bishop Jocelin is recorded to have built a choir or a part of a choir between 1175 and 1179; and to him the whole of the present choir used to be ascribed. This is manifestly impossible. From him the credit was transferred to Bishop Bodington, who ruled from 1233 to 1258. Now Mr. Watson, with much likelihood, ascribes the earlier part of the work to Bishop Walter, who ruled just when the great Gothic building period was at its zenith, from 1208 to 1232. His guidance lies in the analysis of the plan of the vaults, the curvature and mouldings of the ribs, and the construction of the springers. From a consideration of these he arrives at the conclusion that the work was done in five instalments, with, possibly, short intervals between them, between the years 1220 and 1270 or thereabouts. To the first period belongs the south-western compartment of the crypt. Here the ribs are pointed in section; and in order to bring them all to the same height the diagonals are segmental, while the transverse arches remain semicircular. To the second period belong the north and south aisles of the crypt. Here the diagonals are semicircular; the other arches of the vault are pointed. To the third period belong the north, south, and eastern aisles, and the eastern chapels of the choir above. The mouldings of the ribs here are of later character; and ridge-ribs, both longitudinal and transverse, are introduced. To the fourth period belongs the famous and intricate vault of the middle compartment of the crypt. Here the mouldings of many of the ribs are again later in type, and the ribs are interwoven into geometrical patterns by the addition of liernes. The fifth period includes the stair vaults in the crypt, which have tiercerons or intermediate ribs, and late angular mouldings. To these must be added much of the vaulting in the eastern chapels and aisle of the crypt, as the same late mouldings occur there.

Two objections present themselves to the above order of operations. First, why was the middle of the crypt left open, and not vaulted, till the choir above was finished? Second, why were the eastern aisle and chapels of the crypt left to be vaulted last of all? The answers of the author are interesting. As to the first, he tells us that the clearstory of the choir was built *from inside*, and that it contains stones many of which are nearly half a ton in weight. These were raised, not by a crane, but by a screw-jack. Obviously, if the crypt had been already vaulted, its slight vault would have collapsed at once under the weight of the screw-jack and the blocks of stone. Secondly, all these blocks had to be wheeled in to their places on the floor of the crypt just beneath the screw-jack. The builders, therefore, had to leave an opening somewhere in the walls of the crypt. That they left an opening for a long time in the east wall of the crypt is plain from the fact not only that the vaulting hereabouts is late, but that the middle piers of some of the two-light windows have later mouldings than the jambs, and, therefore, were not built till much later than the latter, so as to leave passage for the carts.

As to the peculiar vault of the middle crypt, it has no doubt its rationale, if we could find it. Probably it is partly due to constructional reasons, partly to considerations of ritual. In the first place, its plan is conditioned by the fact that the middle crypt has three arches to the west but only two to the east; these two conditions have to be brought into harmony. Secondly, it was necessary to glorify one part of the crypt where was to stand the famous shrine of St. Kentigern, and another part where was to be placed the altar of the Virgin Mary (owing to the fall of the ground there could be no projecting Lady Chapel in the upper choir). To the west, therefore, but nearly central in the crypt, in a small square compartment, surrounded by four pillars, was placed the shrine. And to the east and west of it two large compartments were vaulted, after the manner of Lincoln Morning Chapel, with a central stalk; while in front and to the west of the altar of the Virgin, that there might be no obstruction,

* "The Double Choir of Glasgow Cathedral; a Study of Rib-vaulting." By T. L. Watson, F.R.I.B.A. Glasgow: James Hedderwick & Sons. 1901.

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Glasgow Crypt. East.

another large compartment was vaulted, like the Lincoln Consistory or Southwell Chapter House, *without* a central pier. Hence the exceedingly bewildering plan of this crypt.

Mr. Watson's hypothesis is coherent and well argued. How far his evidence is trustworthy could only be ascertained by a detailed examination *in situ*. It will be little to the credit of the Scottish architects if they fail to test rigorously the mass of detail which is now laid before them. For ourselves, it must be said that Mr. Watson's treatment appears now and then not to be rigorously critical. It is altogether unscientific to appeal to French Gothic as a guide to English chronology (p. 105). The two Gothics, English and French, went on in the main independently and at a different pace. Moreover, in England itself, as Mr. Prior has well shown in his "Gothic Art in England," there was not one school of Early English Gothic, but several. Mr. Watson must make up his mind whether Glasgow is to be correlated with the Canterbury and Chichester Gothic or with that of Wells and Cwm Hir, or with Lincoln, or with Yorkshire Cistercian. He must not appeal to them all at random. Moreover, he has an objectionable way of turning his probabilities a few pages later into certainties, *e.g.*, "The church of Jocelin must have been pulled down by Walter," p. 20, becomes on p. 22, "We have seen that Jocelin began by pulling down the unfinished church of Jocelin." What he ought to have said is, "We hazarded the conjecture," and a very unlikely conjecture it is. For he tells us that the portion of the church carried out either wholly or in part by Jocelin between 1175 and 1179 was a choir with vaulted crypt, and probably also with vaulted aisles. We should want a great deal of evidence, of which Mr. Watson adduces next to none, to induce us to believe that such a great mass of recent work was pulled down only twenty years later; builders, at any rate in England, were practical men, nor were their employers millionaires. On several minor points the book gives us pause. Viollet-le-Duc is quoted as saying that all the great cathedrals of central France were commenced between 1180 and 1240. It is well known that Notre Dame, Paris, was commenced in 1162, and Sens nearly twenty years earlier. The ridge-rib is said (p. 72) not to be found in our earlier vaults; it occurs in Ripon transept (c. 1170). Nor is it likely that the tierceron or intermediate rib was introduced because some additional support was needed for the ridge-rib in the larger vaults (p. 90); rather it was introduced to facilitate filling in, especially by panels. We are told that the stair-vaults, with tiercerons and abbreviated ridge-ribs, could not have been produced earlier than 1270; both forms of rib occur in the vault of Lincoln nave. Nor is there any reason to assume that the foliated capital shown in fig. 11 is of later date than its twelfth-century base; simple trefoil capitals of this character occur sporadically throughout England and Wales in the last twenty years of the twelfth century—*e.g.*, in Chichester presbytery, St. Anne's, Lewes, Llandaff, Cwm Hir.

Nevertheless, the book is a most valuable

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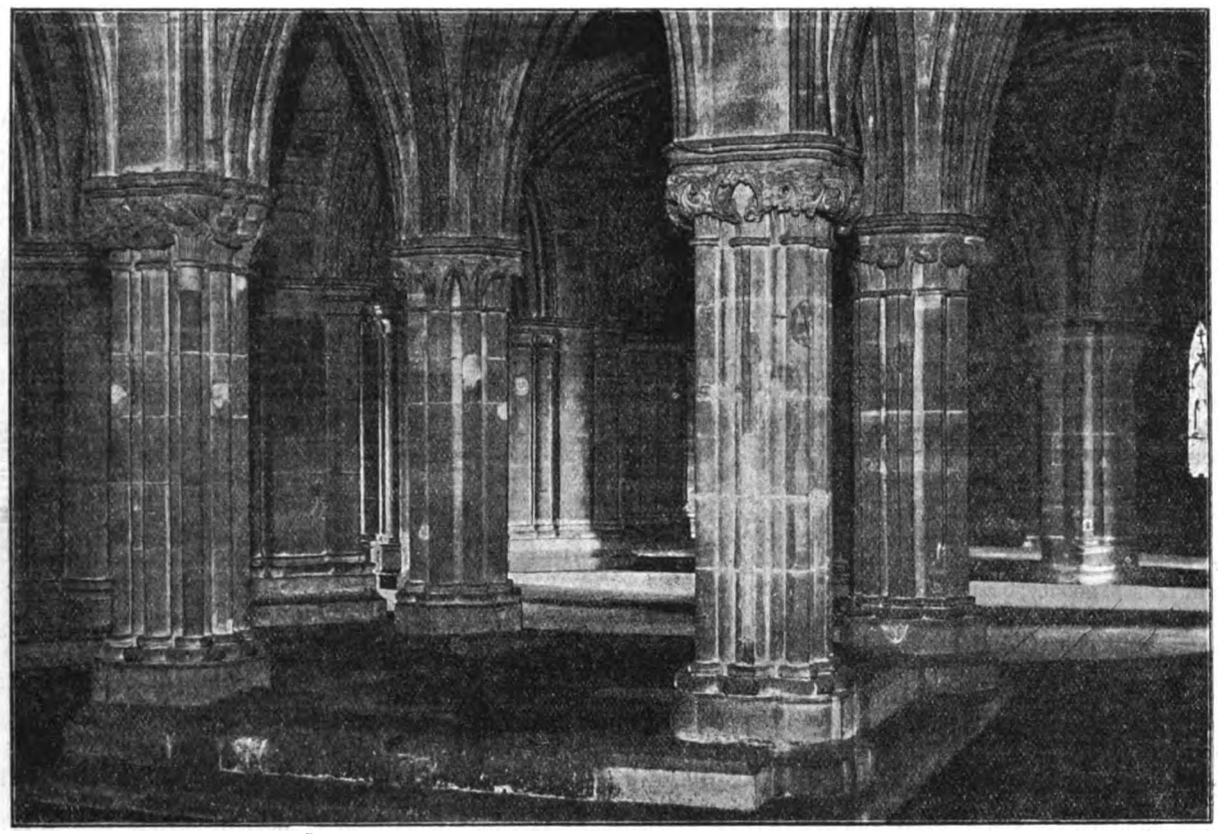

Glasgow Crypt. Site of the Shrine of St. Kentigern.

contribution to architectural literature, and especially to the history of Gothic vaulting in Great Britain. But it is plain that, in any final attempt to settle the disputable chronologies of Glasgow choir, attention must not be fixed on the vaulting alone. Plan, bay design, piers, capitals, bases, indeed every architectural member, will have to be studied; and from a synthesis of the whole a conclusive determination may be arrived at.*

CAN WE DATE OUR SAXON CHURCHES?—II.

By PROFESSOR BALDWIN BROWN.

IN the last paper attention was called to the importance for Anglo-Saxon art of the connexion of England with the Carolingian Empire. England gave in learning and religion what she received back again in another form in architecture. The term "Carolingian" is, geographically speaking, a very wide one, for the Empire of Charles the Great extended from Spain to the Danube and the Elbe. This vast region, however, fell naturally into two halves, the earlier Neustria and Austrasia, prefiguring the later France and Germany. The English came in contact with both west and east, for Alcuin was settled at Tours and planted in its school his own Northumbrian learning, while Willebrord and Boniface wrought the conversion of Frisia and Central Germany. Willebrord and Boniface were accompanied and followed by such a large number of Anglo-Saxon ecclesiastics, like Pirmin the founder of Reichenau, and Lul who succeeded Boniface in the See of Mainz, that it was specially with the regions beyond the Rhine that our countrymen became connected, and our architectural forms in consequence take after those of the east rather than of the west.

Putting aside the crypt or chapel at St. Gervais above Rouen as being still essentially Roman, we may divide the early mediæval monuments of the Frankish empire into two groups. One is marked by the Gallo-Roman *petit-appareil*, sometimes with lines of brick (Basse Œuvre, Beauvais; Vieux-Pont-au-Auge), and especially by an elaborate mosaic-like treatment of facing-stones (St. Christophe, Suèvres; Cravant; St. Jean, Poitiers). These kinds of work are almost entirely confined to the western regions, the only two examples eastward being the so-called Clara-Thurm at Cologne, and the entrance gatehouse to the cloister of Lorsch, near Worms. The careful monograph on the latter, by R. Adamy, has recently thrown a welcome light on the origin of this notable little monument. It is of earlier date by some thirty years than Charles the Great's minster at Aachen, and was built under the rule of a brother of Chrodogang, Bishop of Metz, and with the help of monks transferred to Lorsch from a convent near Metz, from the neighbourhood of which part of the material was conveyed. It is therefore not a local architectural product, but really belongs to the region west of the Rhine. It thus falls into line with the other mosaic-faced structures already referred to, for which the name "Merovingian" has been with some reason suggested. In any case, the architectural tradition known as "Carolingian" does not begin with Lorsch, which is exceptional, but with the minster at Aachen of about the year 800.

From this time onwards there are differences growing more and more marked as time advances, between the Romanesque of the western and eastern provinces. The Frankish architecture of the west gives birth in the fulness of time to the Norman style. This preserves the old facing technique with *petit-appareil* and decorative herring-bone work and *opus reticulatum*, whereas we could hardly find an example of these east of the Rhine. Normandy employs the buttress, while this feature, after Aachen which has it at the corners of the Octagon, does not appear in early German Romanesque, its place being taken by the decorative pilaster, or *Lisene*. Germany employs the double-splayed window, while the Normans confine themselves to the internally-splayed form. In Germany the column is in frequent use in nave arcades, while in Normandy we find almost exclusively the pier. The characteristic *early* Norman cap is a rude Ionic; the cubical cap is just as characteristic of the eastern province. The mid-wall work universal in Germany is modified in Normandy by recessing. Finally, in the composition of western ends, though the twin-towered scheme is equally characterestic of west and east, yet Germany alternates with this the single western tower not found in the western province, and derived by some from the tower-shaped frontal of the minster at Aachen.

Turning from the west to the east, we find that the monuments which represent the eastern tradition are as a rule dateable, and form a continuous series from Aachen onwards. The so-called Eginhard-Basilica at Michelstadt in the Odenwald, begun in 827 A.D., though only partially preserved, is especially valuable. A little later we have the fine churches of Saxony, of which Gernrode, of the tenth century, is the earliest and most interesting; and from this date onwards to the culmination of German Romanesque in the twelfth century examples are too numerous to mention. It is suggested here that Anglo-Saxon architecture in all but its earliest forms has strong affinities with this early Romanesque of the eastern parts of the Frankish realm, and is out of all

* A plan of the crypt appeared in the *Builder* on July 1, 1893.

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historical relation to the Romanesque of the west as displayed in Normandy.

Upon this basis we can understand why it is that, whenever definite details are forthcoming, it is comparatively easy to tell late Anglo-Saxon work from Norman, and why the character of our architecture was so decisively changed at the Conquest. We can understand, too, how, in spite of this change, there are features in our English Norman that do not appear in the Duchy, such features representing to some small extent (for the west greatly predominates) a fusion of the styles of the two provinces. With these questions we are not now concerned, and it remains to draw out some of the consequences for Anglo-Saxon chronology of what has just been put forward. We will deal in turn with *Lisenen*, with the various forms of window-openings, and with mid-wall work, including the caps of dividing shafts.

I. *The Lisenen.*—These appear as we have seen at Lorsch, about 770 A.D., but have here the distinctly Classical form of short fluted pilasters with debased but somewhat elaborate Ionic caps. They do not appear at Aachen or Michelstadt or at Eginhard's other basilica at Seligenstadt, but we find them again, and still with Classical bases and caps, on the lower stages of the west front of St. Castor, Coblenz, dating from the end of the ninth century. A little later, at the west end of Gernrode of about 960 A.D., the lisenen are losing the character of Classical pilasters and becoming long upright strips either ending under a flat string-course or joined at the top by an arcading of small arches. On the north-west tower of Gernrode these arches are straight-sided, on the other round-headed, and where they spring from the pilasters these last have imposts with a hollow chamfer. Later on the lisenen are often quite plain, but are generally joined by the round-arched arcade, and in this shape, no longer suggesting antique pilasters, they are established features of German Romanesque in the eleventh and twelfth centuries. Occasionally, however, the Classical caps and bases still appear, as at the east end of Mainz and the west end of Trier, both of the eleventh century. At the latter some of the carved caps are of Corinthian design.

Assuming that architectural influence of Germany on England which the connexion of the two countries renders probable, we can use the chronology thus gained for our own purposes. Many English examples of stripwork exhibit, not indeed classically shaped caps and bases, but rude blocks which are meant to do duty for such, and many others plain strips, with sometimes an indication of the arcading. We cannot suppose that our builders borrowed directly from Lorsch or other eighth-century examples a feature that was not taken up in the far more important Carolingian buildings of a generation later. It is reasonable to suppose that the borrowing would take place when the particular feature had become established in the region whence the influence proceeded, and we are directed in this way to the tenth century as the earliest date to which we can ascribe any of our buildings that show this feature, and this will practically mean the time of Edgar and Dunstan. A comparison between the stripwork on the north-west tower at Gernrode with that on the tower at Earls Barton will be instructive (see fig. 2). In both cases the pilaster caps and the string-course have a hollow chamfer. Such correspondence may seem a trifling matter, but trifles of the kind are often of considerable value in the settlement of architectural chronology. It may be pointed out that the peculiarly Anglo-Saxon plan of carrying a flat strip as a sort of frame round an opening is a refinement on the use of the upright pilaster. Any chronological inference which applies to the latter will be equally available for the "stripwork round openings."

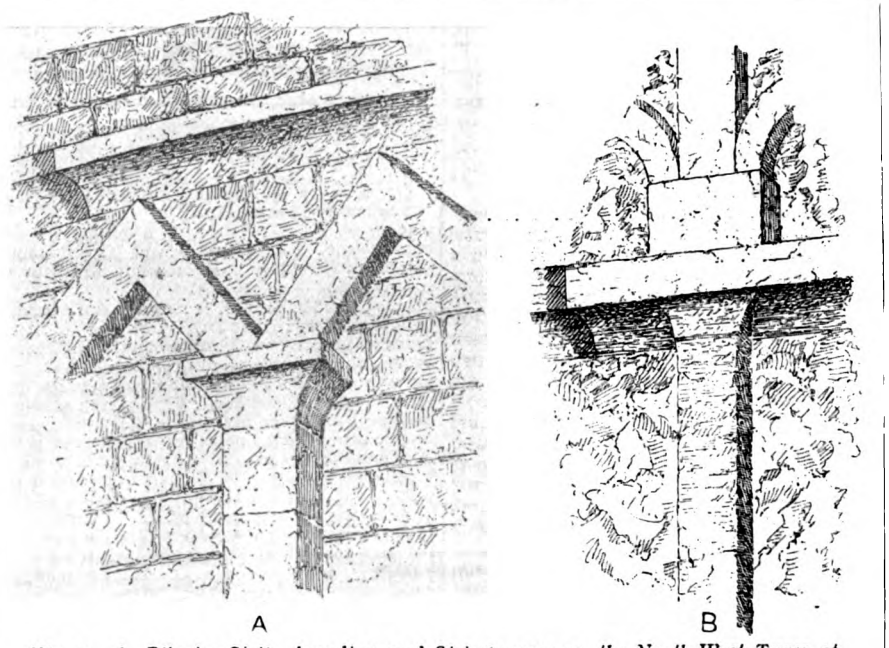

Fig. 2.—A. *Pilaster Strip, Arcading and String-course on the North-West Tower at Gernrode.* B. *Pilaster Strip and String-course at Earls Barton.*

II. *Windows.*—The double-splayed light in the form in which we are familiar

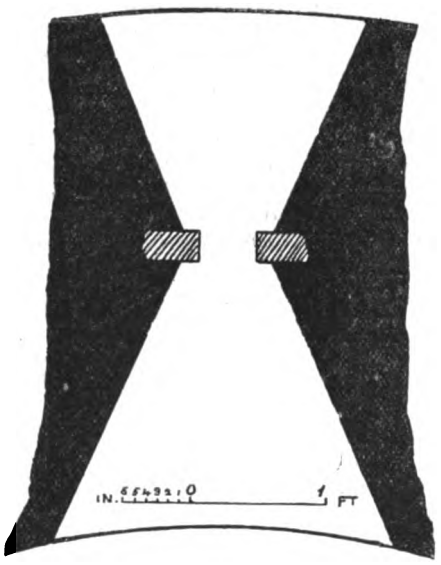

Fig. 3.—Double-splayed Light in the West Front of Trier.

with it, where the central aperture is comparatively narrow, is common enough in Early German Romanesque, but it would be hard to say where it first makes its appearance. The lower stage of the Rotunda at Fulda, of 820 A.D., possesses it, and if Adler is right the east end of the interesting little church of Niederzell, in Reichenau, has still earlier specimens. On the other hand, and this fact is of no little importance, there is nothing of the kind at Michelstadt. This basilica of about 827 A.D. possesses its original nave lights. They are of both the round-headed and the circular form, and are all internally splayed and furnished on the outside with a rebate for a shutter. The windows at Aachen, save some slits in the western flanking towers, are of the large-apertured Early Christian type. In the north flanking turret of the west front of St. Pantaleon, Cologne, there is an example from about 980 A.D. In the north wall of Bishop Meinwerk's Bartholomeus Kapelle at Paderborn of the early eleventh century is an original blocked double-splayed light, while in the west front of Trier, of about the middle of the century, they appear abundantly in a common Anglo-Saxon form (see fig. 3). Here again, the absence of the feature at Michelstadt seems to show that the doubled-splayed was not as early as the single-splayed window, and would lead us to date at least as late as the tenth century any example in our own country.

The shape of aperture in the ordinary internally-splayed windows with round heads is a matter to notice. In England, taking the Anglo-Saxon and Norman periods together, the apertures vary from those of comparatively broad proportions to narrow slits. Norman windows are sometimes very narrow. The smallest in the vaulted chancel at Darenth, Kent, measure 8 in. in width of aperture by a height of 2 ft. 1 in. In late Norman work they are much broader. The accepted early Anglo-Saxon churches which have internally-splayed lights—Monkwearmouth, west front; Jarrow, south side of present chancel; and Escomb—have them of broad proportions, and these appear also in the west wall of the nave of St. Martin, Canterbury, the technique of which suggests an early date. The aperture at Monkwearmouth was about 1 ft. 8 in. by 2 ft. 10 in. of height. This agrees with the German evidence, for the Michelstadt windows and those in the sister basilica at Seligenstadt are of broad proportions. It is true that tall narrow loops give light to the turret stairs in the west front at Aachen, but the imitation of arrow-slits in towers of defence is here the probable motive. On the whole, we should probably be right to regard narrow, internally-splayed lights in Pre-Conquest churches as decidedly late indications.

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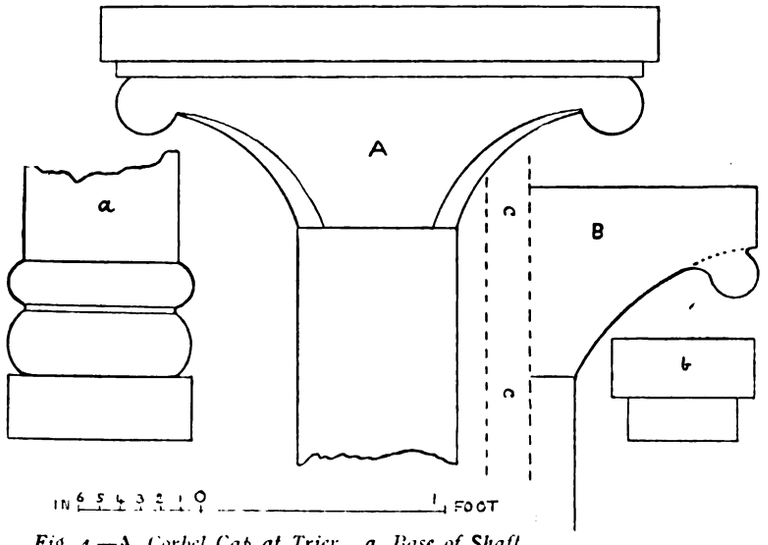

Fig. 4.—A. Corbel Cap at Trier. a. Base of Shaft.
B. Corbel Cap at Sompting. b. Front View of Top of Cap.
c. c. Grating that Fills in the Window Opening.

III. *Belfry and other Openings Divided by Mid-Wall Shafts.*—In connexion with this feature it is of special moment to test the theory of German influence, for what has been termed for brevity "mid-wall work" makes its appearance in Italy much earlier than beside the Rhine. If the pre-Conquest builders may have borrowed this directly from Italy there are no chronological data to be obtained from it. There is nothing, however in which the derivation from Germany seems more sure, for in the first place we find the feature in the vast majority of cases in the single western tower, the connexion of which with that region can hardly be doubted, and in the second there is a correspondence in details that is still more convincing. At Sompting, in the tower which carries a German "helm," we find in the south-west opening of the belfry stage a corbel cap that strikingly resembles a very common German form. The example from Trier, a sketch of which was given in fig. 1, p. 208 *ante*, is drawn to scale for comparison with the Sompting cap in fig. 4. The only difference is that the roll under the abacus is narrower in front view than the abacus. The base of the shaft at Trier is also quite familiar. Furthermore many of the cubical caps employed in our bell-towers of the Lincolnshire type can be matched pretty exactly in the numerous Romanesque towers in Germany. One of our most curious shapes, that in the western belfry opening at Glentworth, occurs at Gelnhausen and at Gernrode. The Scartho cap illustrated in the *Builder* of August 6, 1898, p. 118, fig. 8, is found, with the leaves rather more freely treated, in the oldest part of Werden a. d. Ruhr; the east cap at Glentworth, *ibid*, fig. 7, at Quedlinburg, &c.

The history of German "mid-wall work" is somewhat as follows. The Minster at Aachen introduced the large opening subdivided by columns after a fashion known in Roman times. The smaller aperture divided by a single shaft occurs in some subsidiary buildings thereto attached, and we find it again in the western part of the Minster at Essen, of the middle of the tenth century. It then becomes very common, especially in belfries, and in the matter of chronology may be regarded as in line with the *Lisenen* and the double-splayed window. It would not be safe to date any example of it in this country earlier than the epoch which seems to be indicated by the other evidence already passed in review. No building, in other words, that exhibits any of these three features can be safely placed earlier than the third period, opening with the reign of King Edgar, who, we are specially informed, "rebuilt and endowed churches."

Regarding now from this point of view the 170 Anglo-Saxon churches in the list published last autumn in the *Builder*, we find that the double-splayed window and the pilaster-strip or strip-work round openings) would exclude about fifty examples from any early period, and forty more would be rejected by the appearance or previous existence in them of the double openings with mid-wall shafts, so that n the evidence of these three criteria about ninety churches would be pronounced not earlier than the time of Edgar. There are about a score of others that without these special marks have indications of comparatively late date in the possession (or traces) of western towers, in advanced doorways or chancel arches, or in developed cruciform plans in which the side chapels have grown into complete transepts, as at St. Mary, Dover Castle.

This process of elimination leaves us with about sixty examples for which the above criteria are not available. Of these eleven constitute the acknowledged early list recorded at the opening of this paper, and nothing has transpired in the course of this survey to throw doubt on the received ascription. The only dubious feature is the great height of the nave walls at Monkwearmouth. The dozen might be rounded off by the inclusion, on the ground of its technique, of Stone-by-Faversham, though the late Mr. J. T. Irvine thought it a later fragment. Of the remaining half-hundred examples about a score present long-and-short work in quoins as sole indications of pre-Conquest date. These may be middle or late Saxon, but hardly early, for this quoining does not make its appearance on any of the first group.

Lastly, there is an interesting residuum of a couple of dozen examples, some mere fragments, about which there are no distinctive marks of either middle or late date, and which may, conceivably, therefore, go back to the earliest period. The principal of these are the following: St. Mildred at Canterbury, Stoke d'Abernon, Avebury, Somerford Keynes, St. Michael at St. Albans, Oxford Cathedral, Wroxeter, Heysham Church, Heysham Chapel, Bardsey porch, Sockburn, Hart, and Corbridge. St. Mildred has the big stones at the quoins, which as being in many cases Roman may have been used at an early date. It is a large building, but Brixworth in the seventh century was larger, and Canterbury is a place where ambitious efforts might be looked for. At Stoke d'Abernon the south wall of the nave, 2 ft. 7 in. thick, and part of the adjoining chancel wall claim attention. The technique is flint rubble, irregularly disposed in which are blocks of free stone, and on one of these is a projecting boss with the lines of a Saxon-looking sundial. This seems *in situ*, and its position over an old south door is normal. There are near it also the marks of an old flat-headed light like the one at Wroxeter. Nothing at Avebury seems incompatible with considerable antiquity, for the traces of long-and-short in the quoins are slight, and if, at St. Michael's, St. Albans, we assume the nave arcades to have been cut through pre-existing walls, these walls, with their internally-splayed lights, may be early. Oxford there is not space to discuss. The north wall of the present church at Wroxeter may be early Anglo-Saxon, for the square-headed opening can be paralleled at Escomb. Somerford Keynes should be taken in connexion with Heysham Chapel. The construction of the jambs of both doorways resembles that of the west door of the porch at Monkwearmouth and the chancel arch at Escomb, and the cable ornament on the head of the Wiltshire example may be of any date. The old north door of Heysham Parish Church is also of the same early form, but it must be admitted, on the other hand, that the jamb construction in question occurs also in later monuments, such as Earls Barton. Bardsey porch, if it existed before the tower, may be quite early, as it has the plan of Monkwearmouth and Corbridge, very thin walls and an internally-splayed light. Sockburn-on-Tees bears, in technique though not in proportions of plan, a resemblance to Escomb, and may be of the same generation. Hart, Durham, by the discovery of turned baluster-shafts like those at Monkwearmouth and Jarrow, seems to be linked with these acknowledged early examples. Finally, Corbridge, in virtue of its porch and Roman arch of entrance to the church, which has internally splayed windows, has a good claim to its place in the same rank accorded to it by northern antiquaries.

The intention of the foregoing remarks has been to call attention to some of the points that have to be considered in any attempt to form a chronology of Anglo-Saxon architecture. It makes no pretence to be more than a contribution to the work, in which so many are engaged, of building up some substantial knowledge of the earliest phase of English architecture. The list of examples offered recently is certainly far from an exhaustive one, and there may exist many buildings in the country that have as good a claim to a place on the early roll as these now noticed. Such a claim would, however, be barred by the appearance of any of the definite features that point to a more advanced epoch. There is no space here for any further attempt to distinguish subdivisions in the last and most

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prolific period of the three adopted, or to suggest special criteria by which to identify works of the central or Danish period. We learn of St. Swithun, in the early part of this period, that he "gave great attention to the construction of churches in those places that were without them, as well as to the restoration of those that were ruined and broken down," and it is natural to seek for evidence of his activity in some existing monument. His diocese of Winchester included only Hampshire and Surrey, and had he gone over his borders he would have got into trouble with his brethren of Sherborne and Selsey. Of the Anglo-Saxon churches on the list in Hants and Surrey, Boarhunt, Corhampton, Headbourne Worthey, Hinton Ampner, Little Sombourne, Braemore, Guildford, Godalming, Stoke d'Abernon, all but the last two have pilaster strips, and on the evidence relied on in these papers cannot be of his time; still less, of course, of the time of Wilfrid. Godalming has been so much altered that a criticism is difficult, and at Stoke d'Abernon we have only a bit of walling without definite architectural features, though this may possibly be of his date. On the other hand, Somerford Keynes and Avebury, in the Sherborne diocese, have just the character that might fit them for this epoch. Avebury, in fact, with its suggestion of long-and-short and its single-splayed lights, would suit the Swithun period to a nicety, but it is unfortunately out of his beat.

NOTES.

Trade-Unions and the Taff Vale Case.

THE now celebrated Taff Vale case was, of course, the subject of discussion at the Trades Union Congress last week, and the fact that the House of Lords by their decision in that judgment have made trade-unions legally liable for the acts of their agents rendered necessary a consideration of the new position of these bodies. It was decided to take a test case to the House of Lords to ascertain how far picketing may be carried on without rendering the funds of a trade-union liable for damages. It seems, however, to have been overlooked that these questions of damages do not depend on pure questions of law. That which actually damages an employer is the strike, the cessation of work. But it is perfectly lawful for workmen to enter into combinations and to strike, and it is easy to think of a very flagrant case of picketing which may be unlawful, but which may at the same time be a legal wrong without carrying with it, under the circumstances, any right to damages; for an act of picketing would not be such as would carry with it damages unless some substantial loss could be proved to have flowed from it. We are inclined, indeed, to think that the Taff Vale case will have little effect on the funds of unions, because the very fact that an injunction may be obtained against a union in respect of the acts of its agents will have the effect of enabling employers to protect themselves before serious injury has accrued to them. So-called test cases are usually unsatisfactory and are frequently misleading, because when a real struggle arises the facts may be different, perhaps only slightly, but sufficient to render a decision in a previous "test" case inapplicable. We believe that trade-unions would be well advised merely to watch the action of employers and to keep a careful eye on this branch of law, the development of which in favour of employers is probably more difficult than they think.

Welbeck Abbey.

WE learn that the Duke of Portland will employ Messrs. Trollope & Co. for the rebuilding of the "Oxford" wing at Welbeck Abbey, rendered necessary by the disastrous fire in October last year. The "Oxford" wing was built by the Countess of Oxford (who also restored the ancient Gothic Hall in 1751) after the marriage of her only daughter and heir, Lady Margaret Harley, to William, second Duke of Portland. It is also stated that the new works will comprise the pulling down of the "tan gallop," a long arcade roofed with glass, of which the stones will be utilised for the reconstruction of the "Oxford" wing, and the site will be planted with an avenue of trees. The "tan gallop," with its east and west pavilions, is nearly 1,300 ft. long, and contains upwards of 64,000 ft. superficial of glass. It was erected for exercising the horses during the winter and on rainy days. The property derives its name from the abbey which was founded in King Stephen's day for Premonstratensian Canons of the Cistercian order by Thomas le Flemangh. At the Dissolution, when the revenues were computed as of the value of 298*l.* per annum, Henry VIII. gave a grant of the abbey to Richard Whalley, a wealthy clothier, who sold it to Sir Edward Osborne, of London, citizen and clothworker. From Osborne it passed, through some intermediate hands, to Sir Charles Cavendish, father of William, first Duke of Newcastle, who, in 1623, built the great riding house at Welbeck, which the late Duke of Portland altered and enlarged for a picture-gallery and chapel.

Tintern Abbey.

IT is satisfactory to know that Tintern Abbey has now been transferred by the Duke of Beaufort to a public trust, for, unless a private owner is very public-spirited and wealthy, historical or architectural monuments are less well cared for by private individuals than by some public or semi-public body. The surroundings of Tintern Abbey are not altogether satisfactory, and if, as we understand, some of the adjacent buildings are to be removed, it will be a distinct gain. The whole Abbey should also be carefully surveyed, not with a view to its restoration, but with the object of preventing further decay. Ivy is a picturesque addition to a ruin, but when allowed to grow in masses it has a bad habit of loosening mortar. A ruin so beautiful in itself and its surroundings as Tintern demands the most careful guardianship. It should never be forgotten that it is a ruin, but it should equally be borne in mind that it should be preserved as far as possible from further decay. Every information should also be given to the self-guiding visitor by hand cards, and the loquacious and parrot-like human guide should be prevented from troubling those who do not demand his services.

London Roadways.

IN a city like London, where the traffic is of so varied a character and where control is vested in a number of independent municipalities, it is not at all surprising that different methods of paving should be adopted. In many comparatively quiet thoroughfares macadam is still perpetuated in spite of its manifest disadvantages; in other streets and roads over which heavy traffic passes, granite setts remain in evidence; but in the principal highways asphalt and wood paving are predominant. Yet none of the paving systems in use can be said to fulfil all the essential conditions. These are necessarily of conflicting nature, for any material that is hard and unyielding, like granite, is resonant, and readily becomes smooth and slippery; another such as asphalt, that is compressible and has a fine surface affords practically no foothold in bad weather and becomes depressed in softer parts or flaked in harder parts; another again, such as wood, which is quiet and safe for animals, wears out quickly and is non-sanitary. Putting ordinary roadmaking materials into one category we find all the required characteristics, but the trouble is to combine them in any one form of material. Successful results reported from American and Continental cities cannot be obtained in London whose traffic is unapproached by that of any other place in the world. Moreover it must be remembered that the London omnibus carrying a very heavy load on extremely narrow wheels plays sad havoc with, and places a very unfair strain upon, any type of roadway. No doubt the enforcement of regulations by which the width of wheel tyres should be made proportionate to the maximum load, would vastly facilitate the work of municipal engineers, although such a policy would by no means constitute a solution of the problem presented. One step in this direction is recorded by Mr. Livingstone in a recent letter to the *Times*. Mr. Livingstone, who has had considerable experience of paving operations, directs attention to the "sanitary block" paving. Each block consists of Lake Trinidad bitumen mixed with small fragments of hard stone, the process of manufacture being performed at a temperature of 300 deg. Fahr., and the block is formed under a pressure of 125 tons. So far as our experience of this material extends, it undoubtedly combines most of the advantages possessed by asphalt and wood. It is non-absorbent, gives a good foothold in all weathers, and shows signs of considerable durability. On the latter point it should be said that the only sample subject to really heavy traffic, including omnibuses, has not been laid for a sufficient time to afford reliable data. The example in Carlos-place, which has been in use for four years without repair, shows no sign of wear, and the surface is fully equal to that of the adjoining wood pavement laid only two years ago in Mount-street. The effect of traffic seems to be that the blocks are slightly compressed and spread laterally, thus closing up the joints and making the surface even smoother than at first. Possibly the sanitary block system may not be of sufficient durability to stand exceptionally heavy traffic. That remains to be proved, but in the meantime it appears to be clear that the material is quite suitable for many roadways where neither wood nor asphalt is entirely free from disadvantage.

Australian Hard Woods.

A RECENT number of the "Bulletin of Miscellaneous Information," which is issued at irregular intervals from the Royal Botanic

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Gardens, Kew, contains a Report of a good deal of interest by the late Mr. Ednie Brown, Conservator of Forests, on the Australian hard woods Jarrah and Karri, which are of much value for all kinds of out-of-door work. Of the Jarrah wood Mr. Brown states that—he is speaking of wood which had already been in use for sixty years—"it seems capable of standing wear and tear for another 100 years." Water seems to have no effect upon it. Of the Karri wood the Report says:—"For bridge planking, shafts, spokes, felloes, and large planking of any sort, flooring, general waggon work, beams, it is unequalled in this colony." The whole Report should, therefore, be carefully studied by those who are interested professionally in matters having to do with the construction of buildings, for it is open to doubt whether sufficient attention has been paid in this country to the Australian hard woods, and at the present time, when we hear so much of trade within the bounds of the Empire, it is desirable to use this feeling for the spread in the mother country of really sound commercial products.

Safety of the Brooklyn Bridge.

PUBLIC opinion in New York has been much agitated latterly by a comparatively small, but still sufficiently significant, mishap to the Brooklyn Suspension Bridge, and the alarm felt has been somewhat naturally increased by the fact that another failure occurred two or three years ago. When the bridge was opened for traffic in May, 1883, it afforded five passage-ways between the opposite sides of the East River: one footway, two cable-car tracks, and two carriage-ways. Since then two tracks for trolley-cars have been added, and there can be no reasonable doubt whatever that the structure has been loaded fully up to, and possibly beyond, the safe limit. Under such circumstances it is hardly fair to throw blame upon the original designers, although, in the light of more recent engineering experience, we may be able to see where some details of construction might be improved. Examples of bridge building such as the Newcastle High-level and the Menai Tubular bridges have neither developed faults nor signs of weakness under greatly-increased loads, but this happy circumstance may be traced in no small measure to the ample margin of strength which has always been allowed by British engineers. On the other side of the Atlantic the tendency has been, and still is, to regard the factor of safety with a certain amount of suspicion, as a thing that may conduce to waste of material if not carefully watched. The effect of this policy, as applied to bridge construction, is obviously to place a strict limit on any increase of load or variation of stress, but no such consideration appears to have entered the minds of those responsible for the safety of the Brooklyn bridge. It was bad enough to add nearly 50 per cent. to the original load, but it was much worse to admit to the additional roadways trolley-cars capable of powerful dynamical effect, and no one need be in the slightest degree surprised to hear of repeated failures. The first warning was given by the buckling of the stiffening trusses of the floor system, and the second by the breaking of nine suspenders by which the roadway is hung from the main cables. At the centre of the main span the trusses have slip joints, permitting a maximum longitudinal movement of about 7 in., and the cables also move, but in a vertical direction. Therefore the lower ends of the suspension rods move backward and forward as temperature varies. At the points of connexion, trunnion blocks are provided to which the rods are secured. Owing to inefficient action of the trunnions, largely due to want of proper supervision, a heavy bending strain has been brought upon the suspension rods, the strain being first in one direction and then in the other. Unfortunately these reverse strains were greatest at the centre of the span where the rods were shortest, and consequently possessed the minimum degree of flexibility, and the mischief was aggravated by the rusting of the screwed ends. The most extraordinary feature revealed in connexion with the present mishap is the inadequate nature of the supervision exercised by the responsible officials, and it is clear that in future a thorough system of inspection must be continually maintained. Some modification of structural details is also required to guard against the recurrence of failure. The main trusses should be made continuous across the centre of the span, and expansion joints might be formed at a short distance from each tower. Then no necessity would exist for hinged joints, as the great length and flexibility of the suspension rods would prevent the existence of injurious strains at the points of connexion.

High Speed Railways.

THE paper read last week at the International Engineering Congress at Glasgow by Mr. Lasche on high speed railways is a very important one. He describes fully the experiments on high speed electric cars which are being carried out at great expense by the Allgemeine Elektricitäts-Gesellschaft of Berlin. The details given are of great practical value to engineers. For example, liquid starting resistances have been found feasible, and this device will get over many difficulties. In the experimental line at the Berlin works the pressure used is 12,000 volts, but Mr. Lasche contemplates a pressure of 40,000 or 50,000 volts on the three-phase system. The speed for which the car has been constructed is 200 kilometres (124 miles) per hour. If this high speed is to be used on railways it will be absolutely necessary to have a separate track with lines in both directions for the express trains. The present system of signalling will also need altering, and crossings and switches will have to be abandoned. In the discussion Sir William Preece praised the way experiments were made in Germany, and complained that in England large sums of money were spent in trying to prevent experiments being made at all. He instanced the proposed electrical mono-rail between Liverpool and Manchester, and the costly opposition the promoters experienced in getting their Bill through Parliament. In our opinion, however, there would not have been so much opposition if the promoters could have referred to successful experiments. Professor Silvanus Thompson was of opinion that the conversion of railways from steam to electricity was the most important field of research for electricians at the present time. He deprecated the spending of a great deal of money in useless experiments like the one recently made at Earl's Court. He hoped that English manufacturers would equip practical research departments on the same lines as those in which the author had conducted his experiments. Professor Carhart mentioned that an entirely novel single-phase high-pressure system was shortly to be tried in Michigan, U.S.A. In this system, when the train pulled up, the motors would not be stopped, and hence the load on the line could be kept fairly constant.

Stained Glass.

MESSRS. POWELL & SONS have just completed a stained glass window which is on view at the Whitefriars Glass Works; besides its artistic treatment, the interest of this window lies in the fact that it is a German order and is going to the German church of Immanuelskirche, Frankfurt. The glass is of the mosaic treatment, similar to that done by Messrs. Powell & Sons at St. Paul's for Sir Wm. Richmond. This treatment was specially chosen by the donor in contradistinction to the Modern German style. The window will probably be regarded rather as a curiosity in Germany, but we hope it may draw favourable attention to a more rational treatment of glass decoration in that country. The scattered way that stained glass is nowadays introduced into churches makes it a difficult form of modern decoration to accept seriously. Sometimes the poetic completeness of the old Gothic churches is realised, but we fear they are too often disturbed by unsuitable innovations. In the case of a modern church the mosaic treatment has several advantages: one is the peculiar opalescent and jewel-like effect which is obtained and makes it suitable for concentrated decoration; it is also displayed to the best advantage among simple surroundings. We do not know whether its immense weight is likely to render it less durable from the "creeping" of the lead; for this reason, at any rate, it is probably undesirable for large windows such as those of the fourteenth or fifteenth centuries.

Stirling.

WHEN so many tourists are returning from holidays in the Highlands it is not untimely to suggest that those who are concerned with architecture should not pass Stirling by unvisited. This there is certainly a tendency to do, and it is not perhaps surprising, since it lies so closely on the border line of the Highlands that tourists are inclined to leave this town on one side and make either for Edinburgh or some Lowland place. The situation of the castle is remarkable, but what is more noticeable architecturally is the influence of French art. The house popularly called Argyle's Lodging, but once the home of Sir William Alexander, the poet, who was created Earl of Stirling in 1632, might have been transferred bodily from the banks of the Loire. The remains of the mansion known as Mars Work is as ornate as anything in Touraine, whilst the palace itself is distinctly reminiscent of France. No place more strikingly marks the connexion between Scotland and France before the Union, and there is something remarkable in seeing architecture which is so suitable to and so characteristic of the sunny climate of France struggling, so to speak, for existence in the uncongenial and stern atmosphere of Scotland. The Grey-

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friars' Church equally shows traces of the same influence, so that a student who will spend a morning in Stirling will find matter for interesting and suggestive study.

THE RUSSIAN PAVILIONS AT THE GLASGOW EXHIBITION.

APART from the forestry exhibits, the portions of the Russian section which will prove of most interest to our readers are the buildings themselves. These are six in number, but two of them—devoted to flour and cereals—are very small, and need not be further referred to. The other four buildings are large wooden structures, built in the national style, garishly coloured, but undoubtedly picturesque, although to English eyes somewhat bizarre. They were all designed by Schechtel, a Moscow architect, and are worth careful study.

The building devoted to agriculture is perhaps the most important, and consists of a lofty nave about 11 yards wide, and two aisles, each about 7 yards wide, with large windows in the aisles and clearstory. The principal entrance is in the centre of one side, and two other entrances are provided in the extreme bays on the same side. The walls are painted —chiefly in pale green and salmon—and the shingles are coloured Indian red to imitate tiles. The forestry building consists of a lofty hall about 60 ft. wide with high-pitched roof having half-hipped gables, and has a verandah along one side, with a square tower rising from the end bay. The tower has a simple pyramidal roof, and forms (on the ground floor) a vestibule between the projecting porch and hall. The walls are painted light-brown and buff, and the shingles blue. The building devoted to mining industries is still more like a church, and has a nave and one aisle and an octagonal tower and spire masking the front end of the aisle ; the shingles here are green. The most characteristic building of all is that devoted to miscellaneous exhibits. It is an ecclesiastical-looking structure on what is known as the central type of plan, and has an octagonal tower over the central area with tiers of sharply-pointed gablets and a lofty octagonal spire. The picturesqueness is increased by various annexes. The walls are salmon colour, and the shingles reddish brown.

It is not likely that the architectural details will be imitated in this country, but the construction of the roofs may serve as instructive types. That over the Agricultural Pavilion is roughly shown in figs. 1 and 2, which have been redrawn from rough sketches, and not from accurate measurements. The span of the nave is about 11 yds., and that of each aisle about 7 yds. The supporting posts measure 10 in. by 10 in., and are about 20 ft. apart. As shown in fig. 2, intermediate trusses are supported on cross timbers and struts midway between the posts. The dimensions of the various timbers forming the trusses are only approximate. The truss is of the hammer-beam type, each hammer-beam being composed of two pieces (about 9 in. by 2 in.) bolted to the foot of the principal rafter and to the sides of the raking strut. The common rafters are fixed horizontally, purlins being thus rendered unnecessary.

The roof over the Forestry Pavilion (figs. 3 and 4) is more peculiar, being a combination of the hammer-beam and scissor-beam types. The span is about 20 yds., and the framing is approximately as shown in the drawings. The main trusses (fig. 3) are about 17 ft. apart, and the intermediate trusses (fig. 4) are placed midway between them. The intermediate trusses are of the scissor-beam type, with a collar at one-third of the height. The main trusses are similar, but with long raking struts carried up from the posts to the ends of the collars. The raking struts are braced to the rafters and posts by two pairs of pieces measuring about 6 in. by 2 in. Iron straps are bolted to the timbers at the ends of the collars, and at the intersections of the scissor-beams on the king-post. At every other intersection, a single bolt is fixed. Each scissor-beam is composed of two pieces, about 9 in. by 2 in., one on each side of the main timbers.

The Forestry Pavilion contains by far the most interesting exhibits. They are all, or nearly all, supplied by the Imperial Appanages Ministry of Russia. These Appanages, by the way, were originally State lands, which were

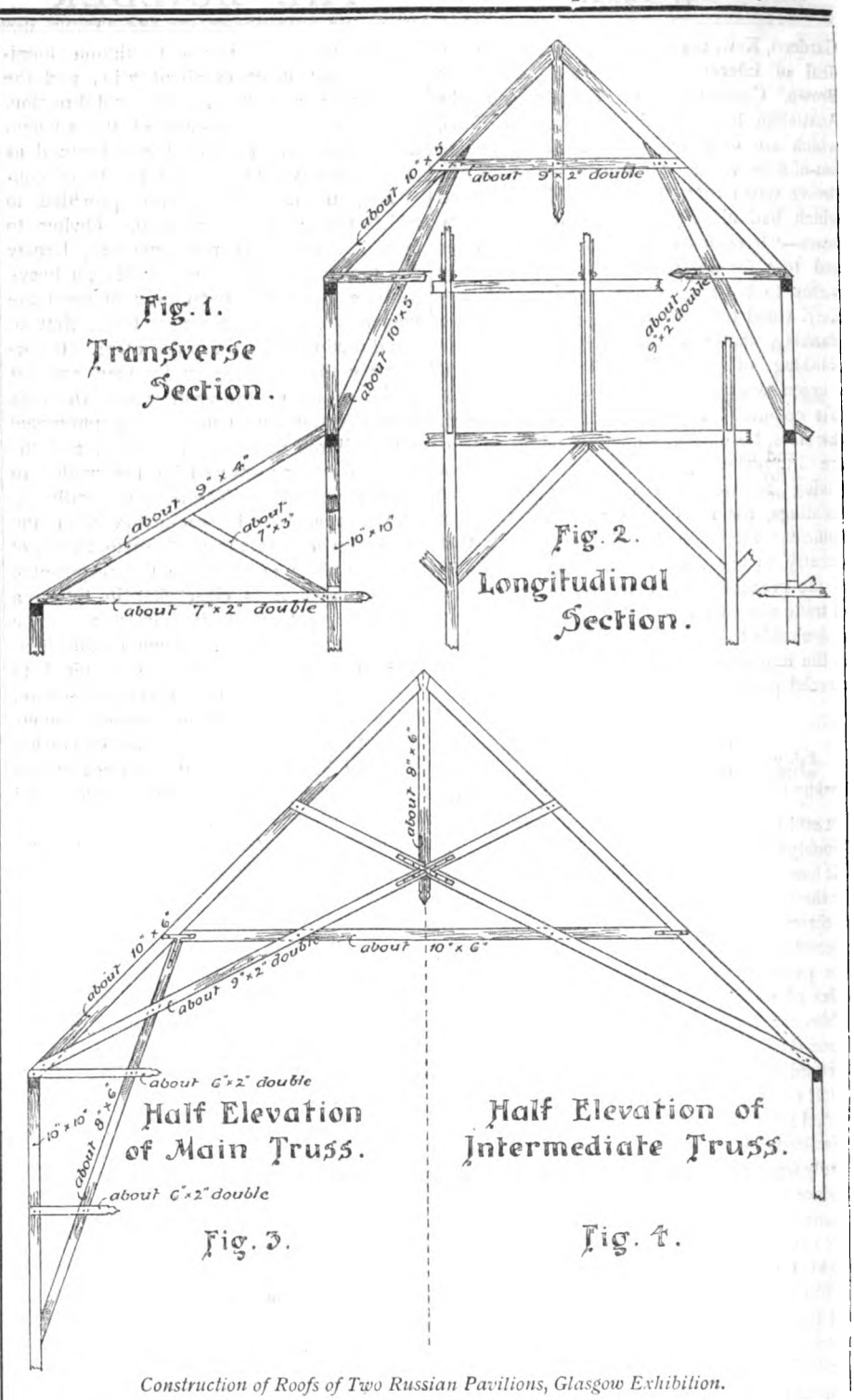

Fig. 1. Transverse Section.

Fig. 2. Longitudinal Section.

Half Elevation of Main Truss.

Fig. 3.

Half Elevation of Intermediate Truss.

Fig. 4.

Construction of Roofs of Two Russian Pavilions, Glasgow Exhibition.

set apart in 1797 by the Emperor Paul I. (who evidently knew what he was about) for the members of the Imperial family, other than the Emperor and his eldest son. The annual revenues have not always been spent, and the surpluses have been devoted to the development of the estates, and also to the purchase of new estates, so that at the present time the Appanages are very valuable properties, producing minerals, timber, vines, and cereals in great abundance. Some idea of their extent may be gathered from the fact that the area of the forests of the Appanages exceeds 150,000,000 acres. About two-thirds of this area is now under management. Regulations are made in order to preserve the forests from depletion. Each portion of a forest passes through a cycle of growth, cutting, and replanting, the duration of the cycle being regulated by the rate of growth in that particular district and other factors ; thus, the "minima revolutions" for pine intended for the market is 160 years in the northern districts and 120 years in the southern. The cycles for firewood trees are much shorter, varying from about thirty to eighty years, according to the locality and the kind of tree.

Most of the timber is sold standing, the average price per deciatine (2·7 acres) being 94 roubles (9*l.* 16s. 0d.) in 1885, 99 roubles 10 copecks (10*l.* 5s. 6d.) in 1895, and no less than 134 roubles (13*l.* 19s. 0d.) in prosperous 1899. The net income from the forests was about 1,640,000 roubles in 1885, 1,900,000 in 1895, and 4,069,000 in 1898. Only about 10 per cent. of the annual production of the forests is converted in the saw-mills belonging to the Appanages, but the proportion is steadily increasing, as new saw-mills are being erected. At Archangel there is a saw-mill for the northern forests of Velsk ; the forests of Vologda supply a saw-mill on the Kovja, a river of the Marie basin, whence the converted stuff passes to St. Petersburg or (for foreign markets) to the port of Kronstadt ; the logs from the Nijni-Novgorod forests are floated down the Volga to the mill at Kaptarski ; and another mill at Strablia serves the forest of Svislotchskaia. There is now a fifth mill at Astrakhan for converting the timber required in the Transcaspian districts. The mills at Archangel and on the Kovja are of more interest to English readers, of the output of that at Archangel from 1894 to 1898 inclusive, 70·7 per cent. was exported to England, the remainder going to Holland, France, Spain, Belgium, and Germany. Of the "pine and silver fir" (*i.e.*, red or yellow deal or fir, and white deal or spruce) exported from the mill on the Kovja, during the period 1897-9, about

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60 per cent. was shipped to England, and about 27 per cent. to Germany.

A comparison of the woods grown in the different forests can be made by examining the 231 specimens collected in the two stands marked No. 7. The specimens are numbered, but unfortunately they are not placed in consecutive order, and it is, therefore, a difficult matter to find any particular number. The specimens are all 10½ in. long, but of various widths and thicknesses, and are polished on one side only. Fifteen different Appanages and Imperial estates are represented, ranging from Velsk and Vologda in the north to the forests adjoining the Black and Caspian Seas in the south. The soft woods, which are, of course, chiefly from the central and northern forests, include "common pine" (*Pinus sylvestris*), "silver fir" (*Picea excelsa*), "Siberian spruce fir" (*Abies sibirica*), and "Siberian larch" (*Larix sibirica*). Among the hard woods are oak, birches, alders, poplars, elms, sycamore and maples, willows, ash, linden, rowan-tree, palm-tree, apple and pear-tree, chestnut, hornbeam, box, hazel, fig-tree, walnut, holly, yew, almond-tree, and others. The student will find it interesting to compare the different varieties of the same species, as well as the different species.

Another series of exhibits (Nos. 8 to 53) is restricted to the timbers most commonly found in the forests, and important from the commercial point of view. The specimens in this series are about a yard long, and are cut from the lower parts of trees which have arrived at the age for exploitation. They are shaped as shown in fig. 5, one half of the face being polished, and include nearly all the common softwoods and hardwoods. In a third series (Nos. 54 to 66), confined to oak, aspen, and softwoods, the specimens are discs, a few inches thick, cut from the lower parts of tree trunks of large diameter; these specimens are "skied," and cannot be properly seen. Among the other exhibits are planks of various kinds of timber, oak stavewood, models of log rafts, &c. At Stand No. 199, which is not mentioned in the catalogue, are some fine unbarked logs of oak, pine, silver fir, and larch, about five yards long and 2 ft. in diameter, but some of the most interesting exhibits are the three series on the "defects and technical vices" of timber, as exemplified in the Velsk forests. The first series is numbered 159 (1 to 44), and deals only with common pine; the second series (No. 159, 45 to 73) is confined to silver fir; and the third (No. 159, 74 to 79) to larch. Thirty-four different names of defects are recognised in the sorting of timber at Velsk, but these may be classified in ten groups:—(1) Knotty wood, (2) rot, (3) curvatures, (4) rot at the foot, (5) clefts, (6) sunstroke, (7) recovered wounds, (8) soft wood, (9) irregularity of the structure, and deformity, (10) dead timber. As the specimens are not placed in consecutive order, it is difficult to follow them according to the catalogue, but the time taken in examining them will be well spent.

Fig. 5.

We have not by any means exhausted the exhibits in the Forestry Pavilion, but sufficient has been said to show that they are of great interest, not only to the timber-merchant and builder, but also to the architect.

In the other pavilions there is little which calls for notice. The exhibits in what we may call the miscellaneous pavilion consist of furs, carpets, trinkets, &c., and some inlaid cabinets and screens, which are, perhaps, more useful than beautiful, but this is not saying a great deal. In the agricultural pavilion the most interesting exhibits are the photographs of the ruins in the vast Imperial domain of Mourghab in Asia, and the relief map of the domain showing the system of irrigation. The pavilion devoted to mining industries contains twenty cases of minerals lent by the Mining Institute of St. Petersburg, some geological maps, and a large stand of building and ornamental stones, including polished granites of various colours, besides minor exhibits.

Undoubtedly the forestry pavilion is of most interest to our readers, and we recommend a study of the materials collected within its walls.

TRADES UNION CONGRESS.

THE fifth sitting of the Trades Union Congress was held on the 6th inst. in the Albert Hall, Swansea, Alderman C. W. Bowerman (London) presiding.

Mr. Fisher (Cardiff Coal Trimmers) moved a resolution re-endorsing the necessity for the extension of the principle of the Workmen's Compensation Act to all trades and occupations, abolition of the fourteen days' qualifying period, and that the basis of claim be fixed on the average wage per hour as representing a week's earnings, instead of the average week as at present; that appeals to the House of Lords be allowed against decisions of the Scotch Courts, that all workpeople be brought within the operations of the Act, that compensation be paid for all injuries sustained in the course of employment, that the 30 ft. limit as regards buildings, &c., be deleted from the Act, and also that the fourteen days' limit as regards liability be abolished, and that compensation be paid as from the date of the injury; that schedule 1B be amended, so that where total or partial incapacity for work results from the injury, a weekly payment shall be made during incapacity of not less than 50 per cent. of the recognised rate of wage of the trade or calling to which the injured person may belong, but in no case shall the compensation paid fall below 10s. per week for persons over eighteen years of age, young persons under the age of eighteen injured in the course of their employment to have their compensation fixed on prospective earnings; in no case shall a person who is in receipt of compensation be compelled to undertake any work other than that in which he was engaged when he met with the injury; also that the subsection as to serious and wilful misconduct of that workman be deleted, and emphatically protesting against the attempt now being made by the House of Lords to abolish the right of appeal to that body in cases of workmen's compensation in England. He said there were many limitations and restrictions to compensation paid under the Act which required to be swept away.

Mr. Markin (Liverpool Carpenters), who seconded the motion, dwelt upon the importance of the elimination of the 30-ft. limit to the workmen engaged in the building trade.

Mr. J. Holmes (Leicester Hosiery Federation) thought it inequitable to ask for the elimination of the serious and wilful misconduct clause. Supposing a man met with an accident when drunk, was the employer to pay him compensation?

Mr. John Ward (London Navvies) was surprised that workmen should have tacitly agreed to the 50 per cent. limitation of their claim for compensation for injury. It was a principle new to British law, and he hoped they would insist upon receiving compensation to the full amount of damage sustained.

Mr Edmund Browne (Standing Counsel to the Parliamentary Committee) said he had drafted a Bill to amend the Workmen's Compensation Act, which included the majority of the points in the resolution. The Bill aboilshed the fourteen days' limit, and the average wage per hour was also met. Mr. Ward's point was not in the Bill, but the Parliamentary Committee had no objection to altering the amount of compensation from 50 per cent. to the full wages. Casual labourers were now included, but the House of Lords had not yet decided how the wages were to be assessed. If a man had worked for however short a length of time his average weekly earnings could be very easily computed. It was one of the most extraordinary things in this most extraordinary Act that it entirely left out the right of appeal to Scotland. They had heard a lot about the House of Lords, but he was bound to say, so far as decisions under the Workmen's Compensation Act were concerned, they had been absolutely right, while the Court of Appeal had been absolutely wrong with reference to the clause asking the courts to estimate the prospective earnings of young persons who were permanently injured. He was of opinion that they ought to be reasonable in their demand. It was a very serious thing to ask any one to estimate what a young person of eighteen would be earning at twenty-five. With respect to the serious and wilful misconduct clause he felt Mr. Holmes was about the only person in the Congress who would leave it in the Bill. It was not so much a matter of suicide or of getting drunk, but if they once allowed an employer to raise the point of wilful and serious misconduct he would raise it as a defence in every action.

Mr. O'Grady (London Upholsterers) wished to know whether his amendment asking that the Compensation Act should be amended to cover all accidents sustained and sickness contracted through ill-ventilated and insanitary workshops, or arising from working at dangerous trades, was included in the draft Bill.

Mr. Browne stated that provision was made and compensation for illness arising from employment.

The resolution was carried.

Mr. W. Brace (Monmouth Miners) moved a resolution in favour of the amendment of the Miners Act by enforcing an eight-hour day for boy labour and colliery winners, and for securing improved working conditions in the mine. He said that in asking for the restriction of boy labour in mines to eight hours per day they were asking for a reform that Parliament ought to grant.

Mr. Carter (Castleford Colliery Enginemen) seconded the resolution, which was carried.

Mr. T. Smith (West Ham Gasworkers) moved a resolution in favour of a general eight-hour working day.

Mr. Honney (Fulham Shop Assistants) seconded the resolution, which was carried.

Mr. Albert Stanley (Cannock Chase Miners) proposed "That the Parliamentary Committee render all assistance possible to the Miners' Federation in pressing forward the Miners' Eight Hours Bill."

Mr. Walsh (Yorkshire Miners) seconded the resolution, which was carried.

The concluding sitting of the Congress was held on the 7th inst., Mr. Bowerman presided.

Mr. W. C. Steadman moved:—"That as the housing problem demands drastic solution, we, the organised workers, call upon the Government to amend parts one and eleven of the 1890 Act Amendment Bill, to make provision for dealing with the owners of unhealthy houses, to extend the time for repayment of loans to 100 years, and the establishment of fair rent courts. Further, that this congress thoroughly endorses the principles contained in the Bill promoted by the Workmen's National Housing Council, and introduced into Parliament by Dr. Macnamara, and demands of the Legislature that no time be lost in dealing with overcrowding and excessive rents. The congress further instructs the Parliamentary Committee to press the Government for facilities and support for the passing of this Bill in the next session of Parliament; and to take steps with a view to the amalgamation and concentration of labour forces on the housing question, not only for the purposes of legislation, but so that in any district where a slum or house famine exists the local authority shall take the necessary steps to provide proper accommodation at the cost of construction and maintenance." A good many people imagined that the whole of the 1890 Act was practically a Housing of the Working Classes Act. But parts one and two of the Act did not apply so much to housing schemes as to clearance schemes. In his experience of clearance schemes, it was impossible to rehouse on the site the same number of people as had been displaced. Municipalities put in force clauses 1 and 2 of the Act to clear away a slum district, but, unfortunately, under the present law they found it a very costly operation. In all clearance schemes they had got to compensate the owners of the property to the fullest extent unless they could prove to the Local Government Board that the area they were going to clear was an unhealthy one, when the owners of the property did not come within the Land Clauses Act. Apart from that one exception, it cost to put the Act into operation 80 per cent. more than it otherwise would do in adopting Clauses 1 and 2 of the Act. As the law gave municipalities power to prosecute a butcher or a fishmonger if he sold food unfit for human consumption, he contended that the same law should apply to the owner of slum property, and instead of compensating the slum-owner he should be prosecuted. The only land that was vacant to-day was agricultural land, and they could purchase that land for agricultural purposes for a very nominal amount. The County Council of Sussex purchased some land for 1*l.* per acre, but when they wanted land on which to build a lunatic asylum they had to pay 100*l.* per acre. He maintained that before they could solve in a practical manner the housing problem they had got to tackle the land question, and if the owner was going to demand more than agricultural value for his land when required for housing schemes, then he ought to be taxed now on the amount which he intended to ask as the value of the land.

Mr. Walsh (London Tinplate Workers), who seconded the motion, said that for the first time they were asking a Parliamentary Committee to take this matter up with a view of securing local action for improving the housing of the working classes.

The resolution was carried unanimously.

Mr. E. C. Gibbs (London House Decorators) moved, "This congress, having in mind the importance of cheap transit as a means towards the solution of the housing problem, instructs the Parliamentary Committee to urge upon the Board of Trade the necessity of bringing pressure to bear upon the railway companies to strictly comply with the Cheap Trains Act, 1883, by issuing cheap tickets to all classes of workmen, and further to take such steps as may be necessary to cause all railway companies to issue third-class season tickets at the correspondingly cheap rates at which they now issue first and second class season tickets."

Mr. Cheeseman (London Fawcett Association) seconded the motion, which was agreed to.

CHURCH FOR LEA AND HOLLOWAY, SHEFFIELD.—It is proposed to erect a new church for the newly-created parish of Dethick, Lea, and Holloway. The architect is Mr. Percy H. Currey, of Derby, and the contractor, who has started work, is Mr. J. W. Wildgoose, of Matlock.

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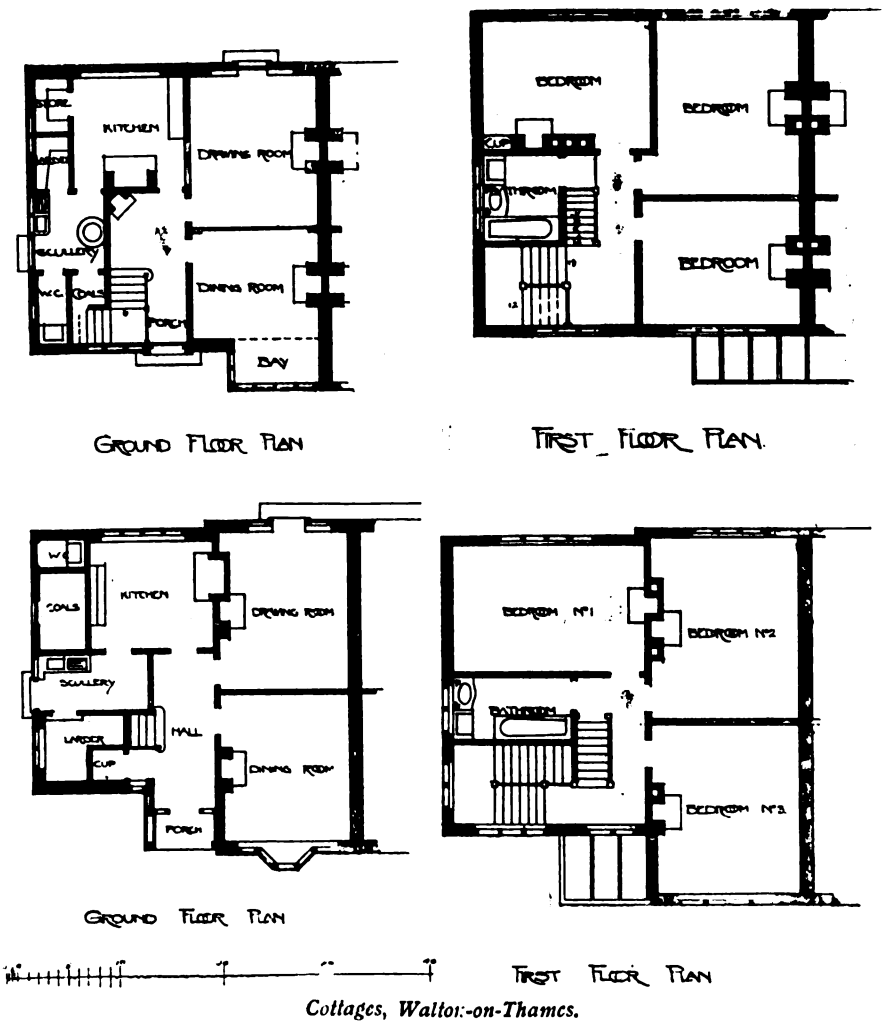

Cottages, Walton-on-Thames.

Illustrations.

"GLEBELANDS," WOKINGHAM.

THIS house, the illustration of which appeared in the Royal Academy Exhibition this year, is red and white. Messrs. Bottrill & Son, of Reading, were the builders; Messrs. Longden did the heating, &c.; Messrs. Wenham & Waters did the glazing and casements and the cast leadwork generally. Mr. Ernest Newton was the architect.

GRIMSTON COURT, YORK.

THIS house is in course of erection for Mr. J. J. Hunt on a fine site in the centre of his estate about three miles east of York. The site was laid out and planted some years ago for a smaller house, which somewhat restricted the arrangement of the present one.

The house will have fine views over the Plain of York, the Yorkshire Wolds, and the Vale of Derwent.

It is being built of 2-in. red Leicestershire bricks and Ketton stone, with oak for timbering. The works also include lodges, stables, electric light station, &c.

Mr. Anelay, of York and Doncaster, is the builder, and Mr. W. H. Brierley is the architect.

The drawing was in this year's Academy.

RUSSIAN PAVILIONS, GLASGOW EXHIBITION.

THE Wood Industries Pavilion and the Mining Pavilion which we illustrate are two of the Russian pavilions at the Glasgow Exhibition. An article on the Russian pavilions at the Exhibition will be found on another page of this issue.

ROADSIDE COTTAGES, WALTON-ON-THAMES.

THESE cottages are built very simply of local material, and quietly finished in every particular. Messrs. Niven & Wigglesworth are the architects.

DESIGN FOR A BILLIARD-ROOM.

THIS design is sufficiently explained by the drawing and the plan illustrated. It is the work of Mr. W. J. Tapper, architect.

COMPETITIONS.

INFANT SCHOOL, ST. ALBANS.—The local competition at St. Albans for the new infants' school at Garden Fields has resulted in the work being given to Messrs. Smee & Mence. Mr. S. Doddimeade Edmunds received the only premium awarded.

THERMAL WATER PUMP, BUXTON.—The first premiated design in the competition for thermal water pump, Buxton, was that by Mr. Gustave Agate, Pendleton, Manchester. The second premiated design was by Mr. C. Swain, Buxton, and the third by Messrs. Warren & Cargill, Matlock Bridge.

MUNICIPAL ENGINEERS AT GLASGOW.

THE Municipal Engineering Section, Section VII. of the International Congress of Engineering, was opened in the Engineering Lecture Theatre at the University, Glasgow, on Tuesday morning last week. The section was arranged by the Incorporated Association of Municipal and County Engineers, and the President (Mr. E. G. Mawbey, C.E., of Leicester) occupied the chair. There was a large and representative gathering of members of the Association present from all parts of the kingdom.

The President, in his inaugural address, said,—As representatives of that branch of engineering practice which is, perhaps, more closely identified than any other with the health of the people of the United Kingdom and our Colonies, it is fitting that we municipal engineers should take a duly prominent part in this International Congress, at what is possibly the greatest exhibition ever held away from London in the British Isles.

And I may here remark that it would have been difficult, if not impossible, to have selected a more suitable site for a great exhibition, and particularly for a congress of civil and sanitary engineers, than this city, which is the commercial capital of Scotland, the Manchester and Liverpool of the North, a seat of profound learning and a veritable hive of industry. Indeed, comprehensive as are the scope and character of the exhibition, it is doubtful whether it can convey more vividly and strikingly an adequate idea of the indomitable energy, pluck, skill, and enterprise of the British race than is conveyed by the great manufacturing works of Glasgow itself and the world-famed ship-building establishments and other gigantic centres of production on the Clyde; for a mere enumeration of the vast and varied industries so successfully carried on in this city and its environs would occupy much more time than I can devote to my brief address.

You will, however, I am sure, pardon me for alluding to one typical instance of the enterprise of the citizens of Glasgow. I feel that I must take this opportunity of congratulating the Civic Fathers of the city, who have been pioneers of British municipal tramways, upon the inception and completion of one of the most important tramway undertakings in the United Kingdom, and in these congratulations must be specially included Mr. Young, the eminent tramways general manager, and Mr. Clark, the able engineer. Even those of us who live at a remote distance from this city have watched with the keenest interest the progress of the undertaking, and if our admiration had not been voluntary it would have been compelled by the splendid way in which really phenomenal difficulties have been overcome as they have arisen. The principal characteristic of the scheme may be said to be that it is so thoroughly up-to-date in every particular, and it is evident that neither pains nor money have been spared to ensure complete success. The equipment of the Pinkston Power Station is especially interesting and instructive, for the plant includes both British and American engines of the highest types produced in their respective countries, and an unique opportunity is here afforded of judging of their relative merits when working under precisely identical conditions. I would strongly advise our members to take the fullest advantage of the facilities afforded for obtaining every possible information as to this grand undertaking and the admirable system of working and management.

Sewage Treatment.

Lieut.-Col. A. S. Jones, V.C., A.M.Inst.C.E., then read a paper on "Sewage Treatment." After a careful review of the numerous experiments in sewage treatment during the past thirty years, the author said it was almost a truism to say that in the matter of sewage disposal each locality required special plans and treatment, and he only pretended to put forward a few general conclusions. 1. In works of sewerage, limit and regulate as far as possible the volume of sewage by excluding sub-soil and clean surface water. 2. Interpose a narrow, deep catch pit or grit chamber at some convenient spot for taking clean heavy matter out of sewer, and then an iron screen (§ in. opening between bars) before the sewer discharges into the deepest part of tank large enough to hold two or more hours' flow. 3. The tank outlet should be over a level weir 1 in. below level of invert of sewer mouth, and as long as convenient; the floor of tank should slope up to this weir from deepest part under inlet of sewer. 4. Such a tank will be quite inoffensive for fifteen or twenty days, and be then nearly full of sludge, to be run off, if level permits, or pumped out. Or it can be left to act as a "septic tank" for six months or more, if it is desired to encourage anaërobic action, with its advantage of less sludge and drawback in offensive smell. 5. There is no practical difference, as regards the subsequent aërobic process, between the tank effluents resulting from the clean and the dirty alternative modes of working the depositing tank described in the last conclusion (4).

6. The essential point in the aërobic process, whether in land or "contact-bed," is sufficient aëration (excess, as by blowing, has no result commensurate with cost of its introduction), and it can be attained by intermittence of sewage and rest, or by continuous passage of sewage through a contact-bed kept always just moist in all its atoms by rain-like dropping on the surface so carefully adjusted as to moisten all parts, and not to form a water seal in any part of the bed. Intermittence is easily arranged on any scale of working, and continuous filtra-

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tion, on the contrary, is difficult even for a few thousand gallons a day. 7. A low estimate for the construction of contact-bed may be taken as 5,000*l.** per acre, but 131 acres of land may often be purchased for that sum (at 38*l.* per acre), and we know that area of land, at Aldershot, to have dealt with about 1,000,000 gallons of sewage a day for nearly forty years, and to be more efficient than ever, while Mr. Dibdin's formula, "one acre of contact-bed to 1,000,000 gallons a day," has been cut down by most of his disciples to 500,000 or 250,000 gallons, and we have yet to learn what the fate of such bed will be ten years hence. The heavy first outlay of capital for land purchase often deters Councils from a freehold investment which must be of great value to a future generation, and leads them into hand-to-mouth expedients which will leave little or no asset when the sewage problem has at last to be faced in real earnest. Since the paper was written the interim Report of Lord Iddesleigh's Royal Commission had been published, and he could not send it to press without adding an expression of his satisfaction with the conclusions set forth by that authority. Land therein evidently held its position as the only natural process, and all other modes of sewage treatment were conveniently classified together as "the artificial processes." They were assured that the latter were in the experimental stage, and were promised a continuance of the careful examination commenced three years ago of the problems involved "which are so many and varied that only investigation and, we may add, experience of a prolonged and varied character will suffice to solve them."

Mr. K. F. Campbell, M.Inst.C.E., Huddersfield, contributed a paper on "Researches into the System of Sewage Purification at Huddersfield by Bacterial and other Methods." The staple trade of Huddersfield is woollen, the waste from which contains fat, soaps, dyes, and a variety of chemicals used chiefly in the dyeing and finishing of the goods, resulting in a highly-coloured soapy liquid. The dry-weather flow of sewage contains 30 per cent. of trade waste, of which but a very small proportion is derived from other than the woollen industries. For a number of years a portion of the sewage was purified by means of chemical precipitation and subsequent filtration through beds composed to a great extent of sand. These, however, rapidly became clogged, and although elaborate provision was made for the cleansing of the filtering material by upward washing, it became impossible thoroughly to do so unless removed from the beds, and as this would have been of frequent occurrence the process was abandoned, the cost of working being already prohibitive. Attention was then directed to the more modern systems of sewage purification, and experiments have since been conducted with three methods, which are as follows:—1. The treatment of the raw sewage in contact-beds. 2. The purification of the effluent produced by chemical treatment in contact-beds. 3. The treatment of the sewage in an open septic tank and contact-beds. The following table shows the loss of capacity of various beds at Huddersfield, and also the period they had been in operation:—

—	Initial Capacity (gallons).	Latest Capacity (gallons).	Loss of Capacity (per cent.).	Period (weeks).
Rough contact-bed, treating crude sewage	19,000	4,800	75	76
No. 7 bed, treating chemically-treated sewage ..	19,230	11,425	41	110
No. 10 bed, ditto	19,940	9,703	51	142
No. 12 bed, ditto	19,200	8,829	54	133
No. 15 bed, ditto	18,072	11,425	37	68
Rough contact-bed, treating septic effluent.....	3,990	2,030	49	34

After the above observations were taken the rough contact-bed treating septic effluent was allowed to rest one month, during which its capacity increased to 2,560 gallons (36 per cent. of original); after five days' working and the tenth filling the capacity decreased to 2,220 gallons (45 per cent. of original); and after a fortnight to 2,130 gallons (47 per cent. of the original capacity). The author, after three years' careful investigation of the subject, has arrived at the following conclusions:—1. That by no process can the formation of sludge be obviated. 2. When the crude sewage is treated in contact-beds the rapid accumulation of matter in the beds renders the process impracticable. 3. That by the use of a small quantity of lime and copperas, followed by contact-bed treatment, a satisfactory effluent can be produced. 4. That the contact-beds used for the purification of the effluent after chemical precipitation will not retain their capacity indefinitely, and that in the course of a number of years it will be reduced to such an extent as to render necessary the washing or riddling of the material. 5. That by the open septic process about 40 per cent. of the sludge is destroyed. 6. The septic effluent is not as amenable to subsequent contact-bed treatment as the effluent from chemical precipitation. 7. The capacity of the beds treating the septic effluent decreases more rapidly than that of the beds treating the effluent after chemical precipitation owing to the excessive amount of suspended matter in the septic effluent. 8. The septic effluent after double contact is frequently unsatisfactory. The results obtained tended to show that the sewage problem is one which, even to-day, requires further investigation on the part of the engineer and chemist before the hidden mysteries in connexion with it are properly solved and accepted in practice.

Mr. Fowler, London, moved a vote of thanks to the authors of the papers, and said the delicate process of bacteriological treatment must really come to nothing if they had not an efficient manager to carry out properly the engineer's design. He suggested that the filtering material in the coarse contact-beds should be of bricks, finished off with clinkers and cinders; and he was in favour of a periodical cleaning of the filtering material.

Mr. Midgley Taylor, Westminster, who seconded, predicted that any experimental works put up for bacterial treatment of sewage would be a failure unless they dealt with the whole of the area, thus rendering it possible to obtain a true sample of the sewage to be treated. The question of cleaning bacterial beds had been closely gone into by him, and he calculated that it cost something between 200*l.* and 300*l.* per annum per acre to keep a bacterial contact-bed in order. This annual expense was very much lost sight of by engineers recommending authorities to put in bacterial installations.

Mr. A. J. Martin, Exeter, said the results which Colonel Jones had obtained with land treatment at Wrexham and Aldershot entitled his opinions on the subject to a great deal of respect, and the results which Mr. Mawbey had obtained at Leicester also showed what could be done with land treatment. Possibly the weakest point in connexion with land treatment was that it laid itself open more than any other system to being tampered with in the supposed interest of the rates. Colonel Jones had slightly misrepresented Mr. Cameron's septic-tank system. The great object of the septic tank was to exclude the atmosphere and to preserve an equable temperature in the lower layers of the tank.

Mr. J. Price, Birmingham, said the detritus tank was an absolute necessity of the septic system in Birmingham. Colonel Jones was consistent in having always advocated the land, and he thought he was right. Fortunately, at Birmingham they had been able to get a sufficient area of land up to the present to deal with their sewage, but the next twenty years might force them either to go to a larger area or to bacterial treatment.

Mr. S. Platt, Rochdale, admitted that sludge could not be entirely removed, but it could be to a very great extent reduced. He had been experimentally dealing with 200,000 gallons per day, and the sludge was 2 ft. deep in the tanks after two years' working, a quantity which would be obtained in a week's work by the ordinary precipitation process.

Mr. T. Stewart, Cape Town, who claimed to be the first to introduce the bacterial treatment in South Africa, gave some particulars of the working there.

Mr. Corbett, Salford, said that in beds filled with sprinklers and used practically continuously for five years he had found no deterioration whatever. They had no difficulty with sludge. They disposed of it at 8d. per ton, sending it to sea by way of the Ship Canal.

The vote of thanks having been agreed to,

The President said it was too late to discuss the question of bacterial treatment versus land. They had proved beyond doubt that they could satisfactorily deal with the sewage of manufacturing towns, as well as domestic sewage, by bacterial treatment. But his own idea was that where they had excellent land available, and plenty of it, at reasonable cost the time had not come to disregard such an opportunity and go in recklessly for bacterial treatment. If they had job land at their doors the proper thing was to make the best use of it, and supplement it by bacterial methods where land in sufficient quantity could not be obtained.

Water Supply Works for Birmingham.

The sitting was resumed on the 4th inst. under the presidency of Mr. E. G. Mawbey, C.E., when Mr. Mansergh, C.E., President of the Institution of Civil Engineers, delivered a lecture on the works which are now in progress in the Elan Valley for supplying water to the city of Birmingham. Having explained that the present daily water needs of Birmingham were 18 or 19 million gallons, which in the present dry season rose to 24 million gallons a day, Mr. Mansergh said the source of the new supply was the river Elan, a tributary of the Wye. The distance from the lowest reservoir to the centre of Birmingham was eighty miles, divided pretty equally between tunnel, cut and cover, on the one hand, and iron and steel pipes crossing valleys. Mr. Mansergh then showed by means of lantern slides the position of Birmingham and the Elan watershed, Manchester and Thirlmere, Liverpool and Vyrnwy, and the scheme which Sir Alexander Binnie has suggested for London. The mean rainfall on the watershed was 68 in., rising to 94 in. in years of heavy rainfall and falling to 44 in. in times of drought. The reservoir at Caban Coch, with the submerged dam, was then shown on the screen, Mr. Mansergh stating that from this reservoir they expected to get 27 million gallons of water a day and to send down the stream a further 27 million gallons as compensation water. Mr. Mansergh next showed by slides the means by which the flood water was dealt with during construction, and followed this with an interesting description of the village built to accommodate the workmen. It contains about 1,200 people, with schools, recreation-hall, wash-houses, and hospitals. One of the hospitals was intended for infectious diseases, but was not used much on account of the precautions to keep out smallpox and typhoid. There was also a doss-house, in which all men who came on tramp had to go for a week. They were put in quarantine, in fact, under the supervision of the doctor. They had also to have a bath, and were given a clean nightshirt. This had proved most useful in keeping the village free from infectious disease. The canteen-keeper had no interest in the sale of beer, and the Corporation was able to make 1,500*l.* a year, which was being spent for the benefit of the men employed upon the works.

Mr. Harpur, Cardiff, moved a hearty vote of thanks to Mr. Mansergh for his lecture. He did so with great pleasure as a frequent visitor to the works, and one who had considerable knowledge of the district. He considered the works to be the finest of the kind which up to the present had been attempted.

Mr. W. Weaver, Kensington, seconded the vote of thanks, which was accorded with acclamation.

Municipal Sanitation.

Mr. W. Weaver, Kensington, then read a paper on "Municipal Sanitation." He said, included in the duties of a municipal authority, those appertaining to sanitation ranked as most important, inasmuch as upon their efficient discharge the health and comfort of the community to a very large extent depended. House drainage, as far as consistent with efficiency, should be made as simple as possible. Complication necessitated extra expense, and this, with other details of sanitary administration, meant extra rent. It could not be disputed that sanitary inspection had been an active factor in bringing about the present difficulty of making house-room too expensive for the poor. Water, like air, was a necessity of life, and both should be pure, free, and unstinted. The two latter qualifications might be unattainable, but there should be no question as to the purity, and only by municipal ownership could there be any future chance for a free and unstinted water supply. Most of the provincial towns own their respective water supplies, but in London, where the supply, pure and efficient, was in the hands of private enterprise, many inconveniences were inflicted upon

* Such beds at Salford and Birmingham cost 10,000*l.* and upwards per acre.

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the consumers, arising to a large extent from the somewhat absolute statutory powers conferred upon the companies, and the manner in which those powers were exercised. Quite recently, at enormous trouble and expense, the Metropolitan authorities had had to make a determined stand (fortunately with success) against the water companies, who were submitting for State approval by-laws dealing with water supply and fittings. Although the London County Council, innocently or otherwise, had interpreted the storm of indignation thus aroused with regard to the fittings as having been directed against the supply, it could not be gainsaid that whatever arguments (and they were many) might be urged in favour of the Metropolitan water companies, it remained a sound principle that a vital public necessity such as water should not be left to the supply and control of private enterprise for purposes of profit. With reference to sanitary administration, one of the great difficulties arose from inability to enforce cleanly and sanitary habits on the occupiers. Some slight remedial effort in this direction had been made within the past two years by the passing of the Verminous Persons Act, but the practical application of the measure was extremely limited owing to its inherent difficulties.

Subject to wise use, the power to acquire land generally would be a great boon, if conferred on Local Authorities, instead of being, as at present, restricted to special Acts for special purposes. If each municipality owned the site of its town and its environs, the enhancement of the value of the latter by the work and prosperity of the former would form a valuable corporation asset in reduction of rates, and corporation land stock would form a popular and profitable investment for the savings of the inhabitants, encouraging local energy and habits of thrift. Main paved streets should be thoroughly washed at night and the solids prevented from passing into the sewers, unless the latter were large with a good flow to outlet independent of pumping. Machine brooms should thoroughly sweep the surface whilst saturated, leaving the refuse in ridges about 2 ft. from kerbs. Such refuse after draining should be heaped and picked up in the early morning. By following this system of cleansing, the surface water flushed the sewers during their minimum flow, and only comparatively solid refuse had to be carted away—an economical consideration. The prompt and regular removal and sanitary disposal of towns' refuse was an imperative necessity.

Mr. Macdonald, Glasgow, also contributed a paper on the disposal of sewage.

Mr. Midgley Taylor, Westminster, moved a vote of thanks to the authors of the paper.

Mr. George Chatterton, Westminster, seconded. The vote of thanks was accorded unanimously and briefly acknowledged.

The meeting then adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the Building Act Committee of the London County Council, held on the 29th ult., the proceedings were governed by the clause in the Order of Reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the Order of Reference. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage and Projections.

Fulham.—That the application of Messrs. Flew & Co. for an extension of the period within which the erection of one-story shops on part of the forecourts of Nos. 83, 85, and 87, North-end-road, and No. 1, Beaumont-crescent, Fulham, and the erection of a block of flats with one-story shops in front, on a site between No. 83, North-end-road and Beaumont-mansions were required to be completed, be granted.—Agreed.

Bermondsey.—That the application of Mr. A. Murray for an extension of the period within which the erection of buildings on the site of Nos. 73 to 101 (odd numbers only), inclusive, Old Kent-road, Southwark, was required to be completed, be granted.—Agreed.

Clapham.—Buildings on the south side of Clapham Park-road, Clapham, to abut upon Park Hill (the Council of the Metropolitan Borough of Wandsworth).—Consent.

Clapham.—A school building on the site of Nos. 62 and 63, Clapham Common South-side (Mr. J. O. Smith for the Girls' Public Day School Company, Limited).—Consent.

Deptford.—The retention of a newspaper stall and book stands in front of No. 151, New Cross-road, Deptford (Mr. J. H. Waterworth for Mr. F. Hulbert).—Consent.

Finsbury, Central.—That the application of Mr. T. H. Watson on behalf of Capt. F. T. Penton, for an extension of the periods within which the rebuilding of Nos. 2 to 5 inclusive, White Lion-street, Pentonville, was required to be commenced and completed, be granted.—Agreed.

Hammersmith.—Three houses in the north-west side of Dalling-road and four houses on the north side of Wellesley-avenue, Hammersmith (Mr. G Trotman for Mr. W. Hide).—Consent.

Hampstead.—Bay windows to twelve houses on the south side and eight houses on the north side of Hollycroft-avenue, Hampstead (Mr. W. J. King).—Consent.

Kennington.—A one-story addition at the rear of No. 71, The Grove, Harleyford-road, Vauxhall (Mr. W. Head).—Consent.

Lewisham.—That the application of Mr. E. C. Christmas for an extension of the period within which the erection of houses, with bay windows and shops, on the site of Nos. 49 and 51, Dartmouth-road, Forest-hill, was required to be completed, be granted.—Agreed.

Lewisham.—Three one-story shops on the north side of Stanstead-road, Forest-hill, westward of No. 129 (Mr. R. E. Crossland for Mr. E. Paul).—Consent.

Lewisham.—The retention of the dwelling-houses numbered 335, 337, 339, and 341, with one-story shops in front, on the east side of Brockley-road, Lewisham (Mr. E. Tompkins for Mr. G. Lawrence).—Consent.

Lewisham.—Wood and tile pents over the entrances to a pair of semi-detached houses on the north side of Micheldever-road, Lee, westward of No. 8 (Mr. J. S. Blunt for Mr. W. Marsden).—Consent.

Peckham.—Four houses, with one-story shops, on the site of Nos. 194, 196, and 198, Rye-lane, Peckham (Mr. T. Wilkins for Mr. W. Wilson).—Consent.

Woolwich.—The retention of an addition to a coachhouse and stabling at the rear of No. 23, High-street, Plumstead, abutting on Reidhaven-road (Mr. H. O. Thomas for Mr. J. J. Messent).—Consent.

Haggerston.—Iron and steel balconies at the first, second, and third floor levels in front of the new wing to the North-Eastern Hospital, on the north side of Hackney-road, Bethnal Green (Messrs. Marshall & Vickers for the Committee of Management of the North-Eastern Hospital).—Consent.

Strand.—Two iron and glass shelters at the entrances to an extension of the Trocadero Restaurant, Shaftesbury-avenue, Piccadilly-circus (Mr. G. W. Booth for Messrs. J. Lyons & Co., Limited).—Refused.

Greenwich.—One-story shop fronts to thirteen proposed houses on the north side of Woolwich-road, Greenwich, between Nos. 461 and 491 (Mr. T. N. Dinwiddy for Mr. T. Dinwiddy).—Refused.

Hackney, South.—The retention of a one-story shop front to No. 121, Daubeney-road, Hackney (Messrs. Lamb, Son, & Prance for Mr. G. T. Poole).—Refused.

Islington, North.—A one-story addition on the north side of No. 122, Dartmouth Park Hill, Islington, to abut upon Langdon-road (Mr. R. Midworth for Mr. F. Bryen).—Refused.

Kensington, South.—A one-story addition at the rear of No. 67, Marloes-road, Kensington, to abut upon Scarsdale Villas (Messrs. J. Surrey & Son for Mrs. M. Surrey).—Refused.

Kensington, South.—A two-story building on the south side of No. 7, Cathcart-road, Kensington (Messrs. Law & Allen for Mrs. E. Ward).—Refused.

Marylebone, West.—A one-story porch on the north side of No. 33, Montagu-square, to abut upon Montagu-place (Mr. F. W. Foster).—Refused.

Norwood.—A school building and additions to the clergy-house at the rear of Corpus Christi Church, Brixton-road, Brixton, to abut upon Horsford-road and Trent-road (Mr. J. F. Bentley for the Right Rev. F. Bourne).—Refused.

St. George, Hanover-square.—An addition to the one-story shop in front of No. 225, Regent-street, St. George, Hanover-square (Messrs. H. G. Lancaster & Co., for the Orchestrelle Company).—Refused.

St. George, Hanover-square.—An iron and glass verandah at the first floor level in front of No. 9, Queen-street, Mayfair (Messrs. Spillman & Co.).—Refused.

Strand.—A projecting lamp and iron sign in front of Nos. 7 and 8, Rupert-street, St. James's (Mr. C. Manzie).—Refused.

Woolwich.—A one-story addition at the rear of No. 8A, High-street, Plumstead, to abut upon Mineral-street (Mr. A. L. Guy, for Messrs. Pearks, Gunston & Tee, Ltd.)—Refused.

Width of Way.

Bermondsey.—A one-story shop addition to No. 2, Millstream-road, Dockhead, Bermondsey (Mr. J. A. Stayner).—Consent.

Deptford.—That the application of Messrs. Douglas Young & Co., for an extension of the periods within which the erection of three two-story houses with shops on the east side of Watergate-street, Deptford, at the corner of Trevithick-street, was required to be commenced and completed, be granted.—Agreed.

Fulham.—The retention of an addition to a laundry building on the south side of Garden-row, Fulham-road, with the forecourt fence at less than the prescribed distance from the centre of that street (Mr. A. Howard for Mr. A. Chubb).—Consent.

Hackney, South.—The rebuilding of Nos. 56, 58, and 60, High-street, and No. 1, Bridge-street, Homerton, at less than the prescribed distance from the centre of Bridge-street (Mr. J. Hamilton for Mr. W. E. Stevens).—Consent.

Hampstead.—Two one-story additions to the George public-house, No. 210, Haverstock-hill, Hampstead, with the boundary fence at less than the prescribed distance from the centre of the roadway leading from Haverstock Hill to the North-Western Fever Hospital (Mr. D. W. Crawford for Messrs. W. Younger & Co., Limited).—Consent.

Lambeth, North.—An additional story on the one-story addition at the side of No. 10, Juxon-street, Lambeth-walk, Lambeth (Mr. F. A. Powell for Mr. A. Wyatt).—Consent.

Peckham.—A laundry building and a house at the rear of Nos. 881, 883, and 885, Old Kent-road, Peckham, with the forecourt boundary at less than the prescribed distance from the centre of Wagner-street (Mr. E. Crosse for Mr. F. Cole).—Consent.

Rotherhithe.—A church and a clergy-house on the south side of Paradise-street, Rotherhithe (Mr. F. W. Taskar for the Rev. Canon St. John).—Consent.

Whitechapel.—A building and a boundary-fence at less than the prescribed distance from the centre of Vine-court, Whitechapel-road, Whitechapel (Mr. J. R. Smith for Mr. A. W. Brown).—Consent.

Whitechapel.—A slaughter-house, boiler-house, and chimney-shaft on the south side of Winthorp-street, Whitechapel, westward of Nelson-court, with the boundary-fence at less than the prescribed distance from the centre of the street (Mr. A. Roe for Messrs. Harrison, Barber, & Co., Limited).—Consent.

Deptford.—Two houses at the rear of Nos. 45, 47, and 49, Kender-street, New Cross, and the rebuilding of two houses on the east side of Kender-street, southward of No. 49, at less than the prescribed distance from the centre of a passage-way leading to Esther-cottages (Mr. J. H. Waterworth for Mr. W. Falkner).—Refused.

Space at Rear.

Islington, North.—A modification of the provisions of Section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of an addition to No. 6, Ebury-street, Junction-road, Islington, with an irregular open space at the rear (Mr. J. D. Hunter for Mr. F. Cousins).—Consent.

St. George, Hanover-square.—A further deviation from the plans approved on July 31, 1899, under Section 41 (1) (vi.) of the Act, for the erection of a block of residential flats on the site of No. 25, Hanover-square, at the corner of George-street, St. George, Hanover-square, with an irregular open space at the rear, so far as relates to the erection of an addition at the ground floor level at the rear of the premises (Messrs. C. Bell, Withers, & Meredith for Mr. G. H. Schofield).—Consent.

Width of Way, Lines of Frontage, and Projections.

Westminster.—An iron and glass shelter at the Westminster Fire Brigade Station, Francis-street, Howick-place, Westminster (Mr. O. Fleming for the Fire Brigade Committee of the Council).—Consent.

Holborn.—An iron and glass hood over the entrance to the Caledonian Temperance Hotel, No. 5, Harpur-street, Theobald's-road, Holborn (Mr. J. A. Tregelles for Mrs. M. F. Anderson).—Refused.

Kensington, South.—An addition to consist of a projecting wooden frame and doorway in front of No. 2, Cranley-mews, South Kensington (Mr. M. King for Mr. J. D. Hill).—Refused.

Woolwich.—Five houses on the north-west side of Red Lion-lane, Shooter's Hill, Woolwich (Mr. A. E. Parnell for Mr. J. Sanford).—Refused.

City.—An oriel window at the first, second, third, fourth, and fifth floor levels of the Saracen's Head Hotel, Snow Hill, City, to abut on King-street (Messrs. Wilkinson & Parker for Mr. F. Dreage).—Refused.

Width of Way and Space at Rear.

Woolwich.—Three houses on the west side of Barnfield-road, Plumstead, at the corner of a roadway leading from Barnfield-road to Princes-road (Mr. H. Roe for Mr. W. Sutch).—Consent.

Lines of Frontage and Construction.

Hackney, South.—An iron and glass covered-way in front of Nos. 8 and 10, Southwold-road, Hackney, to connect the basement entrances of those premises (Mr. J. Hamilton for the executors of the late Mr. C. Butters).—Consent.

Islington, North.—A wood and glass photographic show-case on the forecourt of No. 48, Junction-road, Islington (Mr. J. D. Hunter for Mr. F. Kotch).—Refused.

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Line of Frontage, Width of Way, and Construction.

Holborn.—A temporary wood and iron motor-car shed on the forecourt of No. 20, Red Lion-square, Holborn (Mr. M. Dukas).—Refused.

Line of Frontage and Space at Rear.

St. Pancras, West.—A deviation from the plans approved on October 9, 1900, under Sections 22 and 41 of the Act, for the erection of six buildings on the north-east side of a proposed diversion of Mornington-road and two buildings on the south side of Mornington-place, St. Pancras, so far as relates to the open space at the rear of such buildings (Mr. A. Whitelaw for London and North-Western Railway Company).—Consent.

Width of Way, Line of Frontage, and Construction.

Southwark, West.—An open iron and concrete gangway across Pontypool-place, Blackfriars-road, Southwark (Messrs. J. Hoare & Son for Messrs. J. Pascall, Limited).—Consent.

Formation of Streets.

Hammersmith.—That an order be issued to Messrs. Clutton sanctioning the formation or laying out of a new street for carriage traffic to lead from Emlyn-road to Hartswood-road, Stamford Brook-road, Hammersmith (for the Ecclesiastical Commissioners). That the name Palgrave-street be approved for the new street.—Consent.

Wandsworth.—A deviation from the plans sanctioned on February 19, 1901, for the formation or laying out of new streets for carriage traffic upon the Totterdown Fields estate, Upper Tooting-road, Wandsworth, so far as relates to an alteration in the position of roads A, C, and D on such plans (Mr. J. Briggs for the Housing Committee of the Council).—Consent.

Woolwich.—A deviation from the plans sanctioned on October 10, 1899, for the formation or laying out of new streets for carriage traffic upon the Eltham Park estate, High-street, Eltham, so far as relates to an alteration in the position of the road to be named Glenlea-road (Messrs. Logsdail & Beale for Mr. A. Cameron Corbett, M.P.).—Consent.

Greenwich.—That an order be issued to Mr. A. Roberts refusing to sanction the formation or laying out of new streets for carriage traffic out of the north side of Woolwich-road, Greenwich, westward of Lombard-road (for Mr. E. T. Fysh).—Agreed.

Hampstead.—That an order be issued to Messrs. Tuckett & Son refusing to sanction the formation or laying out of new streets for carriage traffic on the Powell-Cotton estate on the north side of Westbere-road and north-west side of Minster-road, Hampstead (for Mr. P. H. G. Powell-Cotton).—Agreed.

Lewisham.—That an order be issued to Mr. E. W. Evans refusing to sanction the formation or laying out of new streets for carriage traffic on the Grange estate, on the north side of Sydenham-road, near its junction with Elderton-road.—Agreed.

Lewisham.—That an order be issued to Mr. G. Tolley refusing to sanction the formation or laying out of a new street for carriage traffic in continuation of Oaksford-avenue, Wells-road, Sydenham.—(for Mr. A. Covell).—Agreed.

Wandsworth.—That an order be issued to Mr. J. C. Radford refusing to sanction the formation or laying out of two new streets for carriage traffic out of the east side of Putney Park-lane, Putney (for Mr. J. T. Leader and Mr. S. Taylor).—Agreed.

Wandsworth.—That an order be issued to Mr. W. Rivett-Carnac refusing to sanction the formation or laying out of new streets for carriage traffic to lead out of Gwendolen-avenue and Howard's-lane, Putney (for Mr. J. T. Leader).—Agreed.

Means of Escape from Top of High Buildings.

Southwark, West.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the topmost story of a warehouse proposed to be erected at Vallongo Wharf, Upper Ground-street, Blackfriars (Mr. E. R. Hewitt for Messrs. Vestey Bros.).—Consent.

Westminster.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the sixth and seventh floors of St. James's-court, James-street, Westminster (Mr. A. Blackford).—Refused.

Separation of Buildings.

Bermondsey.—The retention on the ground floor of an opening in the party wall between Nos. 215-217 and 219, Borough High-street, Borough, without making the buildings in conformity with Sections 74 (2) and 77 of the Act (Mr. T. W. Willis for Mr. F. H. Barker).—Consent.

Cubical Extent and Construction of Building.

Whitechapel and Bethnal Green, South-West.—The erection on the east side of Brady-street, Mile End, Whitechapel, between Thomas-passage and Bath-street, and extending back to Foster-street, of a beer store in two divisions, each division to exceed in extent 250,000, but not 450,000 cubic feet, and the erection of a cask-washing shed at such premises (Messrs. W. Bradford & Sons for Messrs. Mann, Crossman, & Paulin).—Consent.

Buildings for the Supply of Electricity.

Marylebone, East.—A chimney shaft and the permanent brick walls of a portion of a proposed electricity generating station on the east side of Grove-road, St. John's Wood, between the Regent's Canal and Lodge-place (Mr. C. S. Peach for the Central Electric Supply Company, Limited).—Consent.

Alteration to Building.

Dulwich.—A lumber-room in the roof of No. 19, Stradella-road, Herne-hill, without the walls of the building being thickened so as to make such walls comply with the first schedule of the said Act (Mr. A. T. Shorey).—Consent.

BOOKS RECEIVED.

BUILDING CONSTRUCTION: ADVANCED COURSE. By Charles F. Mitchell, assisted by G. A. Mitchell. (London: B. T. Batsford.)

CLASSIC ARCHITECTURE: A SERIES OF TEN PLATES ILLUSTRATING TYPICAL EXAMPLES OF THE GRECIAN AND ROMAN ORDERS. By Charles F. Mitchell and George A. Mitchell. (London: B. T. Batsford.)

OBLIQUE BRIDGES IN STONE AND BRICK. By Francis Campin, C.E. (Publishers of the *Railway Engineer*, 3, Ludgate Circus Buildings, E.C.)

THE SANITARY INSPECTOR'S HANDBOOK. Third Edition. By Albert Taylor. (London: H. K. Lewis.)

DIRECTORY OF AMERICANS RESIDENT IN LONDON, AMERICAN FIRMS AND AGENCIES. (London: Eden, Fisher, & Co., Limited.)

The Student's Column.

GAS AND GAS FITTINGS.

II.—ARGAND, REGENERATIVE, AND VENTILATING BURNERS. THE ALBO-CARBON LIGHT.

ARGAND BURNERS.—The Argand gas-burner is a modification of the Argand burner for oil-lamps invented by Argand about a hundred years ago, and many of the earliest Argand gas-burners were, in fact, merely Argand oil-burners altered to gas-burners. A perforated top was fitted in the position previously occupied by the wick, and the gas was admitted through the oil-inlet. Those primitive burners have, however, long been superseded by improved forms invented by Mr. William Sugg.

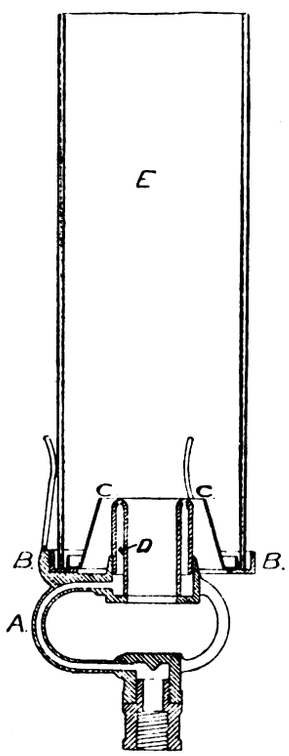

Fig. 22.—Sugg's London Argand.

The City of London Gas Act of 1868 stipulated that "The gas referees shall prescribe the burner for testing the illuminating power of the gas, and it shall be such as shall be the most suitable for obtaining from the gas the greatest amount of light, and shall be practicable for use by the consumer." This proviso still remains in force, and the burner selected by the referees is "Sugg's London Argand No. 1." The Argand burners commonly used by gas consumers differ slightly in their dimensions from the standard Argand, but a description of this burner will serve to illustrate the principles upon which all Argand burners are constructed.

Sugg's London Argand No. 1 is shown in sectional elevation in fig 22. The burner consists of an annular hollow steatite ring (D) pierced with twenty-four holes for the passage of the gas, and connected with a metal body having three small supply tubes (A) and terminating in the socket which is screwed upon the gas service pipe. Above the supply tubes is a gallery (B) which carries a glass chimney 6 in. in height and 1⅞ in. in internal diameter (E). Around the steatite ring within the glass chimney is a metal cone which deflects the upward current of air upon the outer surface of the flame. Another supply of air flows to the flame through the central passage enclosed by the steatite ring, and thus is produced a hollow cylindrical flame supplied with air upon both its internal and external surfaces. Argand burners give the greatest light efficiency when supplied with gas under a pressure of less that 0·5 of an inch, and the dimensions of the chimney and burner orifices must be varied in accordance with the quality of the gas to be consumed. The holes in a burner for gas of low illuminating power must be larger than those made for a richer gas. The London Argand was intended to be used with 16-candle coal gas consumed at a rate of 5 cubic feet per hour, but the highest efficiency is always obtained by adjusting the gas cock to give a flame 3 in. in height. Argand burners are very sensitive to variations of gas pressure, and should therefore always be provided with a governor. The light efficiency obtained by the use of an Argand burner is usually appreciably higher than that obtained by the use of flat flame burners, but the necessity of using a glass chimney with each burner considerably detracts from its practical utility; and the heat emitted from the Argand flame and chimney also tends to make this form of burner unpopular.

It is sometimes argued that as the incandescent gas-light is now "practicable for use by the consumer," and gives six or seven times more light per unit of gas consumed than the Argand, the gas referees in selecting the burner "most suitable for obtaining from the gas the greatest amount of light" should select some form of incandescent burner. When the Act was passed the incandescent system of lighting was not in vogue, and the referees are undoubtedly acting in accordance with the intention of the Act in prescribing the Argand burner for testing purposes, but when comparing the relative cost of lighting by different illuminants London gas must now be accredited with an illuminating power of at least 20 candles per cubic foot instead of the 3·2 candles per cubic foot obtained with the use of the Argand burner.

Regenerative Burners.—The higher the temperature of an illuminating flame the greater is the intensity of the light emitted. Instead of allowing the gas to be consumed by admixture with air supplied to the flame at normal atmospheric temperatures, the air may be previously heated by the heat of the waste combustion products escaping from the flame, and by its radiant heat. By thus heating the air before allowing it to come in contact with the flame, the temperature of the flame may be raised, and its illuminating power thereby increased. Burners constructed to utilise the waste heat in this manner are termed "regenerative burners," and it is found that the light emitted from high-class burners of this description, such as those of Wenham or Siemens, is about three times greater per unit of gas consumed than that emitted from ordinary Argand or flat flames.

The simplest forms of regenerative burner are those constructed on the principle employed by Dr. Frankland in 1853, and by the Rev. W. R. Bowditch in 1854. They enclosed an Argand burner with two glass cylinders, one inside the other, and fitted a plate beneath the burner and outer cylinder so that the air admitted to the flame had to pass down between the two chimneys, and in its passage became strongly heated. Modern modifications of this burner have recently been placed on the market under such names as "the non-mantle incandescent gas-burner," the "mantleless gas-burner," and the like.

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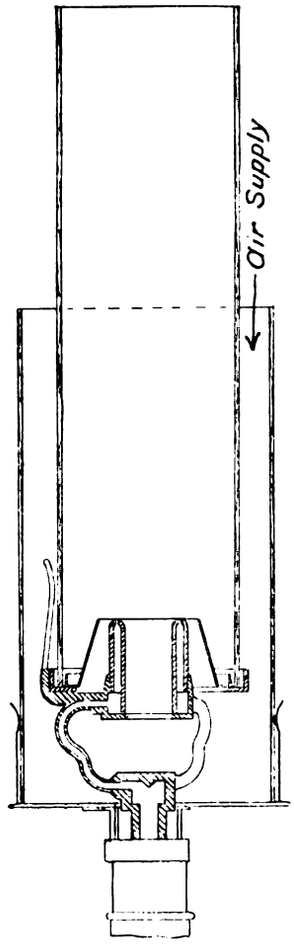

Fig. 23.—Regenerative Argand Burner.

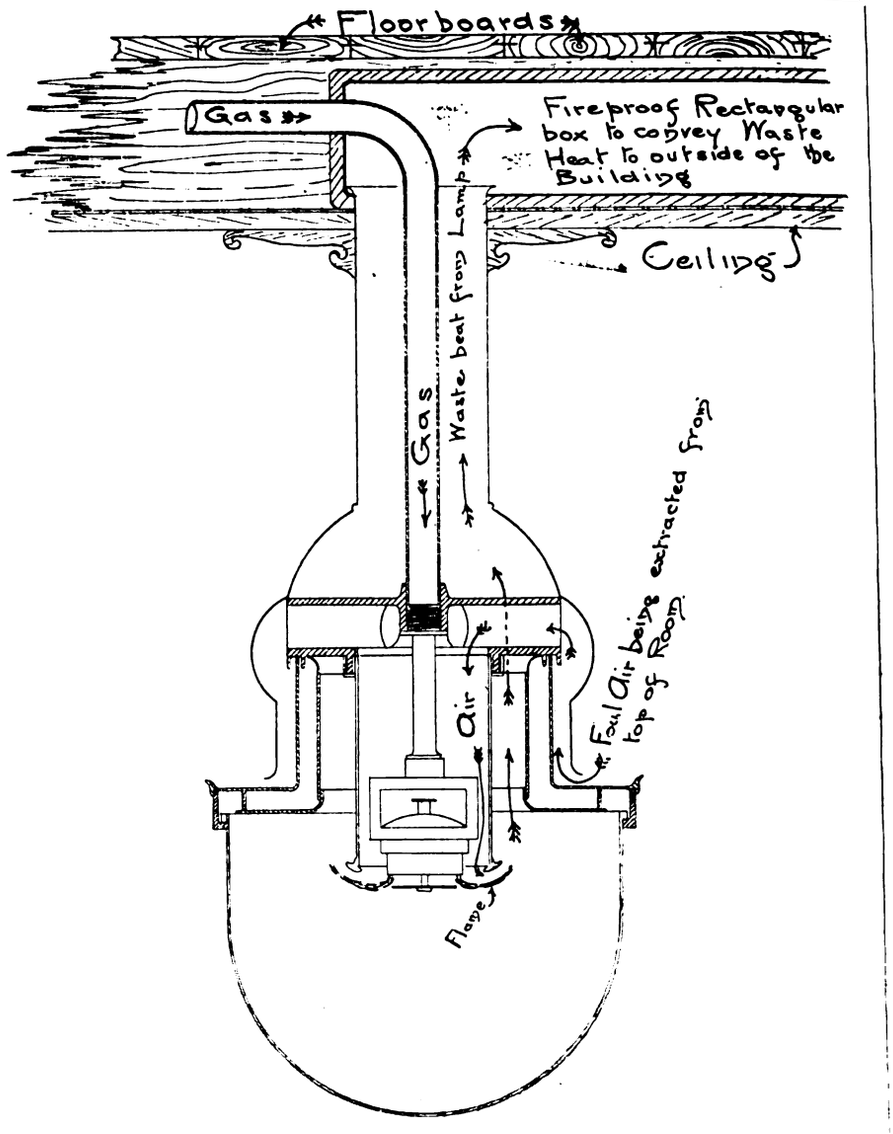

Fig. 24.—Regenerative Lamp used for Ventilating Purposes.

These regenerative Argand burners (fig. 23) do not approach the large Wenham or Siemens type of burner in efficiency, but if well constructed give appreciably higher results than the ordinary Argands. The advantage gained in increased illuminating power is not, however, sufficiently great to compensate for the cost of the frequent renewals of the inner chimney, which is soon destroyed by the high temperature to which it is subjected, or for the inconvenience of having to periodically clean the two chimneys.

Regenerative lamps of the Wenham or Siemens type (fig. 24) also owe their increased lighting efficiency to the heating of the air supplied to the flame. The air is made to pass through a number of flues or passages heated by the products of combustion escaping from the flame. The burners are placed at a considerable height above the floor, and most of the light emitted from them is thrown in a downward direction. They are usually provided with flues to carry away the waste combustion products, after they have been deprived of as much heat as is practicable.

The regenerative lamp is often made to assist in the ventilation of a room (fig. 24). A perforated metal case is placed around the upper part of the lamp, and has its upper end sunk into the space between the ceiling and the overhead floor. The waste products of combustion passing from the lamp into the flue create an updraught, and increase the rate of flow of air through the room. The flue is carried in a horizontal direction between the ceiling and the floor overhead into a brick chimney, or into the open air. It is usually constructed of sheet iron, and must be carefully encased in non-conducting fireproof material.

Different persons have different notions as to what constitutes effective lighting, but Professor Lewes, in the Cantor Lectures delivered in 1897, refers to some experiments made in that year by Major Scott Moncrieff on the suitability of various burners for illuminating the interior of barracks and buildings of a similar character, and the deductions made by Major Scott Moncrieff from the results of his experiments may serve as a guide in estimating the amount of illumination required in other circumstances.

The barrack-room in which the experiments were conducted was 40 ft. long by 20 ft. wide, and the source of light was fixed 8 ft. above the floor. The illumination on a horizontal plane 2 ft. above the floor was then determined by means of a specially-constructed photometer. The height of 2 ft. was selected as representing the lowest level at which it would be necessary to be able to read printed matter.

The following table shows the practical results yielded by the different burners :—

Illumination of a Barrack-room, 40 ft. by 20 ft., at a height of 2 ft. above the floor.

Description of burner.	Total gas consumption per hour, cubic feet.	Illumination
Two Bray burners....	16	Whole room insufficiently lighted, nowhere possible to read small print 6 ft. below gaslamp.
Two flat-flame burners fitted with caps	11·4	About one-quarter the working space illuminated.
Two Stott-Thorpe reflex lights	18	Eight-tenths of working level efficiently lighted.
Two Sugg's workshop lights.....	16	About one-quarter the working space efficiently lighted.
Siemens' regenerative	11	Whole room well illuminated.
Diemel regenerative..	9	Two-thirds working space efficiently lighted.
Two Schulke lamps ..	10	Practically whole working space illuminated.
Welsbach incandescent, with glazed conical reflector	4·3	Whole room brilliantly lighted.

The following conclusions were drawn from the results of the investigation :—

1. The present illumination of the barrack-rooms by means of No. 5 Bray burners is wasteful of gas and inefficient as regards illumination.

2. The Bray burner may be retained if used with caps and grouped as in the "Stott-Thorpe" arrangement. This may in some cases be extravagant in gas, but the illumination is good and the arrangement is not easily damaged, and ventilation is assisted.

3. For reading-rooms, sergeants' messes, officers' messes, and other accessory buildings, the incandescent light is the best illuminant.

4. For places where the light source is some height above the floor, as in gymnasia, lecture-halls, and churches, regenerative lamps give very satisfactory results.

Burners for Illuminating and Ventilating.—The initial cost of ventilating regenerative lamps of good quality is somewhat heavy, and lamps of this description have the disadvantage of requiring occasional cleaning by a skilled workman. For simultaneously lighting and ventilating large halls and theatres gas lamps of the "sun" or "sunlight" class are still extensively used. Strode's sunlight (fig. 25) may be regarded as a typical example of lamps of this kind. It consists of a number of flat-flame burners horizontally inclined and arranged in rings near the mouth of a ventilating shaft. The illuminating value per unit of gas consumed obtained from these burners is rather low owing to the cooling effect of the upward current of air, and the distance of the flame above the floor, but the general lighting effect is good, and where economy is not of the first importance they are often preferred to more economical burners. They are very simple in construction, and any of the burners which may become unfit for use may readily be replaced by new ones at very small cost.

Ventilating by Gas Flames.—When gas is

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required solely for ventilating purposes, it is immaterial whether a luminous or a non-luminous "atmospheric" flame be employed. Chemical laboratories, for example, are sometimes ventilated by shafts in which gas burners are provided to produce a strong upward current, and in such cases luminous and non-luminous flames are of equal value. Mr. Thomas Fletcher found that with a vertical flue 6 in. in diameter and 12 ft. in height a gas flame had the ventilating values indicated in the following table :—

Gas consumed per hour. Cubic feet.	Speed of air current per minute.	Total air exhausted per hour.	Air exhausted per cubic foot of gas consumed.	Temperature at outlet of flue. Normal 63° F.
1	205	2,460	2,460	81° F.
2	245	2,940	1,470	92° F.
4	325	3,900	975	110° F.
8	415	4,980	622	137° F.

The most economical speed of air current for a flue of these dimensions is, therefore, that of 200 ft. per minute, obtained by consuming gas at the rate of one cubic foot per hour. Mr. Fletcher concluded from his experiments that for each circular foot of section in a ventilating flue the consumption of gas should not be allowed to exceed 5 cubic feet per hour.

The Albo-Carbon Light.—Albo-carbon is recrystallised naphthalene, one of the distillates obtained from coal tar. It is solid at atmospheric temperatures, but melts when heated to 174 deg. Fahr., a temperature considerably below the boiling point of water. In the albo-carbon lighting system the naphthalene is melted by the waste heat of the gas flame, and is used for enriching the gas as it passes to the burner. Lumps of albo-carbon are placed in a spherical metal reservoir fitted with a gas-tight screw cap. The gas enters the reservoir and passes through it to the burner. The flame raises the temperature of a copper conductor, which is located a short distance above it, and connected to the reservoir in such a manner that heat is rapidly conducted from the copper to the reservoir. In a few minutes the temperature of the reservoir rises above the melting point of the albo-carbon, and the gas flowing through the reservoir mixes with the naphthalene vapour, and its illuminating power is thereby increased. The burners used are flat flame burners with very small orifices, such as are used for consuming oil gas, and, according to Butterfield, a light of 25 candles is obtained with a gas consumption of 4¾ cubic feet per hour, and a consumption of 0·02 lb. of albo-carbon per hour. One albo-carbon reservoir may serve to supply a number of burners arranged in a cluster around it. A bright, steady flame is usually obtained, but the flame is more liable to smoke than the ordinary coal-gas flame, and more rapidly blackens the ceiling above it. The albo-carbon light is more economical than that obtained from flat coal-gas flames, but the trouble of periodically refilling the reservoir often prohibits its adoption, and of late years it has been largely superseded by the incandescent gas light.

Fig. 25.—Strode's Sunlight Ventilating Burner.

GENERAL BUILDING NEWS.

WESLEYAN CHURCH, WESTERHOPE, NEAR NEWCASTLE.—On the 7th inst. the foundation stone was laid of a new Wesleyan church for Westerhope. The buildings will be of stone, and the cost is estimated at about 500*l.* The large hall will accommodate some 500 persons, and the smaller one about 120. The architects are Messrs. Marshall & Tweedy, and the contractor Mr. W. J. Jamieson.

SCHOOL, ANSTRUTHER, N.B.—A new school has been erected by the Anstruther School Board at the west end of Melville-terrace. The school was designed by Messrs. Williamson & Inglis, architects, Kirkcaldy and Edinburgh, and provides accommodation for 320 pupils. The classrooms are planned so that by means of sliding screens a large room is provided. The building has two entrances, and a corridor 10 ft. wide running from end to end. From it the five classrooms enter, three being used by senior pupils and two by infants. The cost has been upwards of 3,300*l.*

BRITISH SCHOOLS, ILFRACOMBE.—The British Schools, situated in Fore-street, Ilfracombe, having become too small to accommodate the number of scholars attending, the trustees acquired the "Hermitage," with its house and grounds with entrances from High-street and Wilder-road, at a total cost of 3,108*l.* The building was then altered according to the plans of Mr. Allen Hussell. At present the old school will be used for infants, only the elder boys and girls being educated at the "Hermitage." The contractor is Mr. W. Smyth.

MASONIC HALL, OKEHAMPTON.—A new masonic temple was dedicated at Okehampton, a few days ago. The new building is of stone, in the Renaissance style, with slated roof. Externally, the structure is plastered, with brick dressings, while the roof is surmounted by an ornamental turret. The accommodation comprises robing and retiring rooms, a lodge-room, 36 ft. by 22 ft., with a height of 18 ft., a lavatory, and the necessary offices. The entrance lobbies and corridors have tile floors, and all are provided with swing doors. The lodge-room has an open roof. The contractor was Mr. Sleeman, of Okehampton, who executed the work in accordance with the designs of Mr. J. A. Lucas, F.S.I., Exeter.

CHILDREN'S HOMES, HUDDERSFIELD.—Children's homes have been erected at Outlane by the Huddersfield Board of Guardians. There are two homes in the block, the rooms being arranged on exactly similar lines. The building is of local stone. The following is a list of the contractors :—Mason and slater, Mr. J. Hellawell; joiner, Mr. M. Hirst; concreter, Mr. John Cooke; plasterer, Mr. T. R. Crowther; plumber, Messrs. Milnes & Garside; ironmonger, Messrs. T. Heaps & Co.; painter, Mr. A. Wood. Mr. J. W. Cocking, architect, Huddersfield, prepared the designs, and the work has been carried out within his estimate of 2,000*l.*

LABOURERS' DWELLINGS FOR NEWCASTLE.—Mr. M. K. North, A.M.I.C.E., one of the inspectors of the Local Government Board, sat in the Council Chamber of the Town Hall, Newcastle, on the 3rd inst., to conduct an inquiry into an application made by the City Council to the Local Government Board that sanction should be given to a scheme for the erection of dwellings for the labouring classes. The Town Clerk (Mr. Hill Motum) was present, as well as the Surveyor (Mr. Liddle). The Town Clerk said that in carrying out certain of the street works authorised by their Newcastle-on-Tyne Tramways and Improvement Act of 1899, the Corporation, in acquiring property for that purpose, would acquire a number of houses occupied by the labouring classes, within the meaning of Section 114 of the Newcastle Improvement Act of 1892, which was incorporated with the Act of 1899, and now sought the approval of the Local Government Board to a scheme for providing accommodation or dwellings for the labouring class displaced, or for such number of them as under Section 114 they were bound to provide for. The Corporation submitted a scheme for building two blocks of dwellings, one on the site in Albion-row and another on the site in Walker-road. These two blocks of buildings would comprise seventy-two separate dwellings—that was to say, on the Albion-row site the accommodation would be six separate dwellings of three rooms each; and upon the Walker-road site sixteen separate dwellings of one room each, twenty-three separate dwellings of two rooms each, and twelve separate dwellings of three rooms each. They proposed that these houses should afford the most modern accommodation for such class of houses. In the separate dwellings of one room each, there would be a large room, 15 ft. in length, 12 ft. 9 in. in width, and 9 ft. in height, with a screened bed recess, a sink recess, a pantry, a separate water-closet, and a separate coal-bunker. In the dwellings of two rooms each there would be a large living-room 15 ft. in length, 12 ft. 6 in. in width, and 9 ft. in height, with a bed recess, a sink recess, and a pantry, and with a separate bedroom 14 ft. in length, 12 ft. 9 in. in width and 9 ft. in height; also with a separate water-closet and coal-bunker. The houses of three rooms each would have a kitchen, 15 ft. in length, 12 ft. 9 in. in width, and 9 ft. in height, with a bed recess, sink recess, and pantry, two separate bedrooms, one 14 ft. in length, 12 ft. 6 in. in width, and 9 ft. in height, and the other 12 ft. in length, 9 ft. 6 in. in width, and 9 ft. in height. There would also be to each a separate water-closet and coal bunker. Each of these separate dwellings would have the use of a washhouse, and an ash-shoot from each floor to an ash-box on the ground floor. Each room in each dwelling would have a fireplace, and be adequately ventilated. The dwellings would be three stories high. The Surveyor (Mr. Liddle) explained the plans to the Inspector.

CARDINAL NEWMAN MEMORIAL CHURCH, EDGBASTON.—According to the *Birmingham Post*, plans for a memorial church to Cardinal Newman have been prepared by Mr. E Doran Webb, F.S.A.

SYNAGOGUE, FINSBURY PARK.—The Finsbury Park Synagogue, which was consecrated by the Chief Rabbi on the 8th inst., is situated in Princess-road, Finsbury Park. The building provides accommodation on the ground floor for 190 gentlemen and in the galleries for 144 ladies, 334 in all, and is constructed to meet the growing needs of the small congregation, which has been established for many years in temporary premises in Portland-road. The building is provided with two stone staircases, a complete installation of heating on the American plan, and ample cloakroom accommodation for both ladies and gentlemen. The exterior is executed in red brickwork, relieved with stone dressings. The principal entrances to the ground floor are on the main façade in Princess-road, the secondary entrances and the entrances to the galleries being at the rear of the site. The building has been constructed by Messrs. Whitehead & Co., Limited, from the designs of Mr. Delissa Joseph.

CATTLE MARKET, BODMIN.—A new market was opened on the 2nd inst. at West Heath, Bodmin. The work has been carried out by Mr. E. Harris, contractor, Bodmin, and the cost has been about 2,000*l.*, exclusive of site. The work has been performed under the direction of Mr. E. J. Oliver, Borough Surveyor, who designed the whole of the premises.

PUBLIC HALL, HATFIELD, YORKSHIRE.—On the 5th inst. the foundation-stone of a new public hall, to be called the Victoria Hall, was laid at Hatfield. The new building will be 48 ft. by 24 ft., with ante and dressing-rooms, and other rooms for storage, &c. The architect is Mr. Thomas Moat, of Hatfield, and the contractors Messrs. J. D. Gambles & R. Harrop, of Hatfield.

TEMPERANCE HALL, HUDDERSFIELD.—The new Temperance Hall fronting the south side of Princess-street, erected for Huddersfield Temperance Society, was opened recently. The building is in the Italian Renaissance style, and has been erected, at a cost of about 5,000*l.*, from designs and plans prepared by Mr. B. Stocks, architect, Huddersfield. The front is faced with extra hammer-dressed wallstones with ashlar dressings, and the back, in Page-street, with hammer-dressed wallstones and ashlar dressings. The bottom floor is intended to be used as a temperance club, and the remaining two floors provide rooms for meetings and offices for the executive work of the Huddersfield Temperance Society, &c. The work has been carried out by the following Huddersfield contractors :—Messrs. John Radcliffe & Sons, masons' work; Messrs. Wood Bros., joiners' work; Messrs. Milnes & Garside, plumbers' work; Mr. T. B. Tunnacliffe, slaters' work; Mr. W. E. Jowitt, plasterers' work; Mr. Allen Jackson, painters' work; Messrs. Henry Brook & Co., Limited, ironfounders' work; Mr. John Cooke, concreters' work; Messrs. Tomlinson & Milan, Limited, hot-water engineers' work; and Messrs. T. A. Armitage & Co., electrical engineers' work.

TOWN HALL EXTENSION AT SHOREDITCH.—On the 9th inst. the Mayoress of Shoreditch (Mrs. Kershaw) laid the foundation-stone of a new wing which is being added to Shoreditch Town Hall. The extension is on similar lines to the old building and will afford extra accommodation for all departments. The architect is Mr. W. C. Hunt, and Messrs. Killby & Gayford have the building contract, which amounts to 2,833*l.*

FLATS, RUTLAND GATE.—The foundations are now being put in for the four blocks of flats which are to be built upon the site of Stratheden House, Rutland Gate. Mr. Delissa Joseph is the architect.

SYNAGOGUE, HAMPSTEAD. — The Hampstead Synagogue, which was reconsecrated by the Chief Rabbi, after enlargement, on September 8, was originally built nine years ago from Mr. Delissa Joseph's plans. The enlargement has been effected by removing the east wall of the synagogue and extending the building eastward to the limit of the site. The choir, which was originally at the rear of the Ark, is now in the gallery above the Ark. The original number of sittings in the building was 360 on the ground floor and 209 in the gallery; the additional seats provided by the enlargement are eighty-four on the ground floor and sixty-two in the gallery, giving a total seating capacity for 811 souls. Although the present two staircases in Dennington Park-road are in excess of the needs of the London Building Act, the opportunity has been taken, in

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effecting the extension of the building, to provide two supplementary staircases at the east end, one of which leads directly into West End-lane. The design of the original structure has been maintained in the extension, and the opportunity has been taken of redecorating the entire building in pure white. The contract has been carried out by Mr. Henry Lovatt, from the designs and under the superintendence of Mr. Delissa Joseph.

FOREIGN.

FRANCE.—Forty-eight young architects have entered into the preliminary competition for the Chaudesaigues Prize, the subject being "A triumphal arch in honour of a foreign Sovereign." The jury have selected twelve of these to enter into the final competition.——The new Sorbonne is now completed, with the exception of some of the interior artistic decoration, which is being actively carried on. M. André Brouillet has been commissioned to paint the panels of the Vice-Rector's reception-room, and it is proposed to commission M. Poilpot to execute a series of "paysages historiques" in the Salle de la Faculté. It is expected that the formal opening of the new buildings, several times postponed, will now take place at the end of the present year.——The modern Gothic fountain in the Square de l'Archevechée, to the east of Nôtre Dame, Paris, is in process of repair and restoration. It was erected in 1843 from the designs of the architect Parfait Merlieux.——At the Hôtel des Chambres Syndicales du Bâtiment, in Rue de Lutèce, Paris, an exhibition has been opened of the designs sent in for the tenth competition instituted by the "Société Nationale des Architectes." The subject is "A Hospital for Temporary Aid to the Injured."——The Government will shortly commence the works necessary for the construction of a masonry bridge at Valence, to replace the suspension bridge which at present crosses the Rhone opposite that town. The cost is estimated at 1,165,000 francs.——The death is announced, at the age of 72, of M. Emile Basly, member of the Société Centrale des Architectes. He was a pupil of Garnaud, and had obtained, at the time of the 1900 exhibition, the medal offered for the author of the best works in domestic architecture.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Henry Rose, architect, has removed to Holy Rood-street, Chard, from 3, Staple-inn, London.——Mr. J. W. Start, F.S.I., architect and surveyor, High-street, Colchester, and New Broad-street, E.C., has taken Mr. Reginald Rowell, A.R.I.B.A., into partnership. The firm will in future be known as Start & Rowell.

NEW ELECTRIC STATION, ABERDEEN.—The tender of Messrs. G. Donald & Sons, painters, Aberdeen, has been accepted (690*l.*), and also that of Messrs. Sellar & Co., Aberdeen (1,298*l.*) for subway.

EXPORTS OF TIMBER FROM DANTZIG.—An official return shows that the quantities of wood exported from Dantzig during the past five years have been as follows:—In 1896, 234,605 tons; in 1897, 272,604 tons; in 1898, 265,756 tons; in 1899, 308,640 tons; in 1900, 252,342 tons. The year 1900, it is stated authoritatively, was in many ways very profitable for the Dantzig timber trade. The general prosperity prevailing in commercial circles all over the world had a beneficial influence on sales, more especially in the spring, and prices ranged between satisfactory limits. Oak sleepers were an exception, and they were practically unsaleable at Dantzig, as the German State railways now use pine and fir. Other descriptions of oak were also sold with difficulty and at a loss. The several sawmills were fully occupied, but were adversely affected by the more rapid rise in price of the raw material as compared with the sawn wood. In some cases deals and planks were sold for less than the timber cost from which they were cut. Prices for round timber fell towards the end of the year, and only the best qualities were saleable at lower rates. The export trade was, on the whole, carried on during the year under favourable circumstances. There were either floated down the River Vistula or reached Dantzig by railway the following timber goods:—In 1898, 665,055 cubic metres, value 1,010,075*l.*; in 1899, 717,160 cubic metres, value 1,093,990*l.*; in 1900, 429,159 cubic metres, value 637,830*l.*

GREAT FIRE IN THE CITY.—Shortly before three o'clock on Saturday last week one of the City constables discovered smoke to be issuing in dense volumes from the premises of Messrs. W. H. Lascelles & Co., cabinet makers, &c., of 121, Bunhill-row He at once raised an alarm, and by three o'clock about twenty steamers were at work, and this number was gradually augmented until a quarter past three, when no fewer than thirty had been turned out and had got connected with the hydrants. Messrs. Lascelles' works stand in the centre of a group of factories and buildings. The group forms a block, having frontages in Chiswell-street, Whitecross-street, Errol-street, and Lamb's-buildings. Adjoining the works is a timber yard belonging to Messrs. Wm. Oliver & Sons. Backing on to these are the stores of Whitbread & Co.'s brewery, and surrounding the whole are shops, dwelling-houses, a Board school, a mission hall, the headquarters of the London Rifle Brigade, and the depôt of the Globe Parcel Express Company. It was not until about five o'clock that the fire was under control. Nearly the whole of Messrs. Lascelles' buildings and contents have been destroyed. The front stage and contents in Bunhill-row belonging to Messrs. Oliver & Sons are mostly saved, but three-fourths of the firm's stock was completely destroyed, and the damage done by burning, cutting away, heat and water to the surrounding places belonging to Messrs. Whitbread & Co., and Le Grand & Sutcliff, artesian well engineers, was considerable. The fire did not damage the interior of the premises of Messrs. W. Walker & Sons, wholesale cabinet makers, Bunhill-row, but the exterior was damaged in several respects. Their stock is intact, and work and machinery are going on as usual. Messrs. Lascelles & Co. have secured the premises recently occupied by Messrs. W. Scrivener & Co., which, with their own premises at Stratford, will, we are asked to state, enable them to continue their joinery business without any delay. Communications are still to be addressed to their old address, 121, Bunhill-row, London, E.C., as the offices have not been seriously injured. Messrs. Oliver & Sons have asked us to state that they will, owing to their stocks of timber elsewhere, be able to continue their business as usual, and all letters and orders should be addressed to their head office, 120, Bunhill-row.

AUCH.—The artist of the glass, described in our article on Auch last week as a Saxon, was a Gascon; and the words printed "choir, organ," should be "choir-organ."

MUNICIPAL TECHNICAL INSTITUTE, WEST HAM.—The day and evening classes at the Municipal Technical Institute, Romford-road, Stratford, E., will commence on the 21st inst. Classes have been formed in physics, electrical engineering, civil and electrical engineering, art, building, &c. The lecturer in building construction is Mr. Edward Willis, A.M.Inst.C.E., F.S.I., M.San.Institute; the lecturer in technical drawing is Mr. J. H. Fry, F.S.I.; and the lecturer in quantity surveying is Mr. W. E. Trent, F.S.I. The instruction given is of a thoroughly practical character.

REMOVAL OF HOUSE REFUSE FROM FLATS.—The following interesting observations appear in Dr. J. King Warry's Report on the Sanitary Condition of the Hackney District for the year 1900:—During the last few years a gradual change has been creeping over the social life of Londoners. The "home" occupied by one family has given place to the "flat," a unit of a group of families as closely lodged together as the ingenuity of architect and builder can bring them. The closer aggregation of these families demands, therefore, more vigilance in keeping their surroundings free from harmful influences; but the structural arrangement of the block has introduced certain difficulties in safe-guarding their health. The particular difficulty I have met with in Hackney is connected with the disposal of the house refuse in connexion with these buildings. The blocks of flats in this district contain from two to five floors. The arrangements for the deposit of the house refuse until removed by the Local Authority differ. (*a*) In a few blocks portable dust-bins are provided for each tenement to hold the week's refuse, which is kept either on the landing near the door of the tenement or inside the scullery. (*b*) In others a shoot is formed in the walls of the blocks, with doors opening into the passages at the level of each floor, to receive the house refuse from the tenements at that level. At the foot of the shoot is a chamber near the doors of the tenements on the ground floor. Into this the refuse falls and remains until removed by the local dustman. (*c*) Another arrangement, worse than the last, is somewhat similar with the exception that the opening to the shoot is in each kitchen. In some the openings are closed by a simple wooden shutter sliding in grooves, in others an iron drum, one-third of which is open, is arranged horizontally, and is worked by a lever. When the lever is depressed the drum is ready to receive the refuse, and by elevating the lever the drum revolves, throws the dust into the shoot, and is then supposed to cut off all effluvia from the shoot; but, as a matter of fact, on testing it is found they are not air-tight, and it can easily be demonstrated in all that the shoot ventilates into the living-room. The common chamber, or dust-bin to each shoot, is usually in these cases at the rear of the block, where it is emptied once a week. It is obvious that neither of these arrangements is satisfactory. In the first case, the presence of foul-smelling dustbins close to the doors of living-rooms and in passages alive with children is clearly bad. The same remark applies to the arrangement of shoots with doors opening on the landing. Practically the shoots are ventilated into the passages, and this is especially the fact when the chamber receiving the dust from the shoot is at the foot of the staircase. It is almost unnecessary to state that these chambers are very offensive at times. But the most objectionable are those shoots with shutters or other openings into the living rooms. The tenants complain that an evil smell proceeds from them even when closed; that dust is forced into the room when the shoot is used by tenants on an upper floor; that when used by themselves the dust is blown back into the room, and it is consequently extremely difficult to keep the room clean. It would not have been difficult when these blocks were designed to have devised some means by which these difficulties could have been avoided, but now it would involve much labour and expense to make any satisfactory alterations. It is an axiom of sanitation that house refuse should be removed from the neighbourhood of occupied dwellings at the earliest possible date, and if this is true of the house with its attached open space or garden, how much more so is it true of a block accommodating some of them several hundreds of persons? It is contrary to all sound principles of sanitation that garbage should be kept at the doors or under the stairs of occupied houses, or that dust shoots should ventilate into the passages or living-rooms of the same. Even if a daily collection were established it would not remove the objections to the above. The shoots must be abandoned, but our difficulty is to find a place free from objection for the portable bin. It must either be kept in one of the rooms of the tenement itself, or on the staircase or outside at the back of the block. The last is so inconvenient to tenants that they will not adopt it, and of the two former expedients it is difficult to say which is the less objectionable. My object in discussing this is to show how easily such difficulties could be avoided if architects were to give a little of the thought expended on decorations to the convenience and sanitation of dwellings. I am also not without hope that the London County Council will endeavour to obtain such alterations in the Building Acts as will effectually remedy the above condition of things.

BUILDING CONSTRUCTION CLASSES, HIGH SCHOOL OF GLASGOW.—The building construction classes at this school have just been opened. An additional feature of the classes this session is that students will have the opportunity of studying workshop practice in Kent-road School as a branch department of the High School, the two classes working in conjunction with one another. The architectural lecturer in the theoretical department is Mr. D. Bennet Dobson. The practical workshop department is for the use only of students attending the theoretical department.

WATER SUPPLY WORKS, WESTBURY, WILTS.—New waterworks were opened at Westbury on the 4th inst. The cost of construction has been about 13,000*l.*, and the scheme was prepared by Mr. W. H. Stanley, C.E., of Trowbridge. The pumping station is situated on the Bratton-road, about a mile from the town. It is a red brick building, with Bath stone dressings, and contains a storeroom and repairing shed.

BATTERSEA POLYTECHNIC.—The prospectus of the day and evening schools and classes at the Battersea Polytechnic gives a good idea of the thorough character of the work carried on at this institution and of the provision which has been made for the technical, scientific, and general education of the inhabitants of Battersea, Clapham, Wandsworth, and neighbouring districts. The principal work of the Polytechnic is the provision of evening classes for both sexes in all subjects of technology, pure and applied science, art, commerce, domestic economy, and music; but it also provides a technical day school, a science day school for boys and girls, a training school of domestic economy, a domestic economy school for girls, a day school of art, and special day courses in science and technical subjects. During the last session, 250 evening classes in more than 100 different subjects were attended by over 3,100 individual students, while 520 students were in regular attendance at the day schools and classes. The institute is provided with workshops for engineers, smiths, carpenters and joiners, pattern-makers, plumbers, bricklayers, masons, plasterers, and painters and house decorators, and with laboratories for engineering and mechanics, electrical engineering, physics, chemistry, and natural science, and with an art school, photographic rooms, &c., and with ordinary lecture and class rooms, refreshment-rooms, and a great hall. The successes in day and evening classes for the session 1899-1900 included:—A Whitworth Exhibition, three Intermediate County Scholarships, twenty-six Evening County Council Exhibitions and Scholarships, thirty-seven Medals and Prizes, three Domestic Economy Training School Scholarships; total value of scholarships, exhibitions, and prizes, 1,222*l.* The principal is Mr. Sidney H. Wells, A.M.Inst.C.E.

CLOCKS FOR TRAMWAY DEPOTS.—The London United Tramway Company have placed an order with Messrs. J. W. Benson, Limited, of Ludgate Hill, for three large clocks for the depots at Acton, Hanwell, and Hounslow, the first having a large illuminated dial.

CAPITAL AND LABOUR.

CARPENTERS' DISPUTE AT BARRY.—Barry carpenters, who came out on strike in May, 1900, for an advance in wages from 8d. to 9d. per hour, have now declared the dispute at an end, and claim that the majority of employers in the district pay the advanced rate. The local Master Builders' Association, on the other hand, have refused as a body to recognise the advance, and have since that time employed non-unionists at 8d. per hour.

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LEGAL.

ARBITRATION CASE.

MR. GODFREY PINKERTON has now published his award in the matter of the arbitration between Mr. John Thomas Hockley, of Grantham, builder (trading as R. Hockley & Son), and the Trustees winding up his estate, Messrs. John Simpson (Grantham) and J. T. Medcalf (London), against Henry Metcalf and Thomas R. Greig, trading in co-partnership as architects in London. The dispute arose on a contract entered into by Hockley with Metcalf & Greig to build some large flats known as "Irema Mansions," South Kensington, London, for the sum of 25,762*l.* Hockley did a large amount of work on the contract, but, in consequence of the failure on the part of Metcalf & Grieg to keep up their payments, he stopped work and ended the contract. Over and above the amount paid by Metcalf & Grieg prior to the stoppage of the works, Hockley claimed there was due, for work actually executed, a large sum of money. It was also claimed that Metcalf & Greig had been guilty of a breach of contract, and that Hockley was justified in putting an end to the same, and was entitled to damages from Metcalf & Greig for loss on plant, &c., and of profit on the contract. On the other hand, Metcalf & Greig contended that Hockley had been fully paid for all the work he had done, that he was not justified in stopping the work, and that he had committed a breach of contract, and they claimed over 6,000*l.* damages for their loss in consequence. The arbitrator decided and adjudged—(1), that the sum of 2,025*l.* 1s. 9d. was due from Metcalf & Greig in respect of the work executed by Hockley, the value of which he fixed at 17,169*l.* 1s. 9d.; (2), that Metcalf & Grieg should pay the sum of 764*l.* for loss incurred by Hockley upon plant and material supplied on the contract; (3) that there was nothing due from Hockley to Metcalf & Greig in respect of damages claimed by them; (4) that Metcalf & Greig should pay the costs of, and incidental to, the reference, and the costs of the award, as between party and party; (5) the arbitrator also decided that there had been a breach of contract on the part of Metcalf & Greig, and that Hockley was entitled to the sum of 1,183*l.* for loss of profit on the contract, the total sum under which Hockley would have been entitled to be paid, had he completed it, amounting to 20,000*l.* As regards the last item of the award, the arbitrator reserved a point of law, which is to be submitted in the form of a special case stated by the arbitrator to the High Court, as to whether, on the facts stated therein, Hockley is entitled to be paid the sum representing the loss of profit, or any part of such sum; the costs of the special case to be left to the Court. The first part of the award will be enforceable forthwith, but the special case will have to be argued after the Long Vacation, as soon as it can be brought on.

Mr. Theodore Norton, Grantham, was the solicitor acting for Hockley and his Trustees; and Messrs. Morris & Richards, London, were solicitors for Metcalf & Greig—*Grantham Journal.*

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

8,731.—A CAN FOR USE BY PAINTERS AND OTHERS: *E. G. Hill.*—A can for use by painters, French polishers, and other workmen is provided with an interior clip which secures the brush and a wire for the removal of surplus liquid from the brush.

8,780.—PREVENTION OF SPARKING: *E. Eugene-Brown.*—In order to provide a fixed line of commutation and thereby to prevent sparking the inventor makes slots in the field poles in directions at a right angle to, as well as parallel to, the lines of force; for a motor in which the direction of rotation is to be reversed both portions of the divided pole are slotted, and for a dynamo he makes one of the right-angled slots in the back portion of the pole; the slots at a right angle to the lines of force may be cut upon the outer sides of the pole.

8,791.—A METHOD OF ROOFING: *W. P. Whitmore.*—To the outer edges of sheets made of tarred roofing-paper or felt are applied plain untarred strips of fabric, and the upper and lower edges of a covering strip respectively are fastened to one overlapping roofing-sheet and to a layer of cemented or asphalted gravel upon the other roofing sheet, both of which sheets are secured with nails, &c., which the covering-strips protect. The strips are overlaid on their outer sides with asphalte and gravel, the next adjacent joint being made in the same manner.

8,792.—COLUMNS FOR BUILDING PURPOSES: *G. F. Pfahl and W. P. Maynard.*—The columns consist of grooved interlocking blocks, which are cemented or glued together so as to form half columns, the halves being then glued together and joined with interior tie-blocks having dove-tail tongues that fit into grooves cut in the blocks.

8,796.—A CIRCULAR SAW FOR CUTTING PAVING-BLOCKS: *F. Barr.*—The multiple circular saw is intended for cross-cutting battens into pavement blocks; the saws are mounted at the distances required upon a spindle, which is journaled in a sliding frame that is reciprocated by means of a crank upon the main shaft; as the batten is forced endwise on to the pivoted bench, which can be turned down for the removal of the blocks which have been cut, a cam upon the main shaft works the bench by means of rods and a bell-crank.

8,807.—A CONTRIVANCE FOR USE WITH CRANES: *F. Schofield and B. Johnson.*—The inventors' object is to furnish means of rendering an ordinary travelling crane available for driving piles; they fasten the monkey-frame with stays to the rotating frame, which, in one form, may be mounted upon a detached trolley; for the employment of several monkeys at one and the same time they pivot the customary weighted tripping-levers on to a cross-bar, which is hung upon the lifting-chain and is provided with a guide mounted in the frame.

8,814.—RETAINING-WALLS FOR TEMPORARY PURPOSES: *F. Hennebique.*—The retaining-walls are devised for occasional use upon quays, wharves, and similar platforms, they consist of sets of portable cement blocks which are fashioned with a base, a front, and buttresses, and are strengthened with bars of iron: confer also Nos. 10,203, 30,143, and 30,144 of 1897.

8,818.—SLATE MANTELPIECES AND THEIR PARTS: *W. J. Lewis.*—A detached plinth is fastened in a recess made in the jamb or pier, with bolts inserted through holes in the jamb and into screw-threaded holes in blocks that are leaded in the plinth, the plinth thus specified will be adaptable for a jamb or pier, having side-strips which are fastened with angle-pieces and screws inserted in leaded-in blocks. For joining the strips the edges of one of them are pierced for a plate with a threaded hole, a bolt or a wood-screw is passed through the other strip into the screwed hole.

8,820.—MANUFACTURE OF WHITE LEAD: *E. R. Blundstone.*—A strongly alkaline solution is made by dissolving litharge in lactic acid or lead lactate, which will remain in solution ready to be used again. Then, by the employment of carbonic acid, the white lead is precipitated from the solution until it has become neutralised.

8,822.—MECHANISM FOR USE IN GRINDING TOOLS: *C. V. Boys.*—A double guide is devised for grinding a tool against one of two wheels, the tool being held against a bar which may be set at any angle to a piece which will slide in a groove in a plate in order that the tool may be carried across the face of the wheel. The plate, upon the inclined face of which the tool is laid, is caused to slide parallel to the axis of the wheel by a projection that engages with a support which has arms that embrace the wheels, and is adjusted vertically with screws, the inclinations of the four faces of the plate to the horizontal correspond with the angle which is necessary for the clearance of the tool. The two wheels serve for rough and fine grinding respectively, and the angles of the faces are modified in accordance therewith.

8,831.—CONSTRUCTION OF COFFER-DAMS, CAISSONS, BREAKWATERS, PIERS, WELL AND PIT LININGS, &c.: *G. L. Mouchel.*—The blocks or sections consist of concrete moulded around a framework of metal. In the case of a cylindrical foundation cylinder, each of the three sections is made by moulding a thin shell of concrete around the frame in such a manner that the upper concaved end of one shell shall fit the lower convexed end of the next adjoining shell with a layer of grout filled in between them, their end flanges are bolted together, spaces being left in the framework free from concrete, then the flanges and shell are completed by embedding metal loops, which join the bare portions of the framework together with those portions of the framework in more concrete. For rectangular blocks for a quay wall, each block rises to the height of the wall and its two parts are grouted together and strengthened with beams of concrete and a framing of metal, adjoining blocks being fastened together with bars, and concrete being filled into the intervening spaces.

8,840.—AN APPLIANCE FOR WINDOWS: *H. T. Thurman and J. Smith.*—The flange and the rounded body of a pulley frame (held in its place with screws at the sides or at the top and bottom corners) are arranged so as to engage with a rectangular slot in the pulley stile, and in the latter is also cut a rounded recess having a diameter larger than the width of the pulley stile, a face-plate of metal is affixed with pegs at the sides or corners to the flange of the pulley frame.

8,868.—MECHANISM FOR USE WITH LIFTS: *D. Corcoran.*—Upon a frame which is fastened to the cage are pulleys that serve to keep endless chains in engagement with racks upon the lift-guides, and the chains, passing beneath guide-pulleys, are placed in engagement with worms upon the shaft of the rope-pulley which is engaged by a bight of the driving-rope that is extended throughout the well; the cage will rise or fall, respectively, with the driving in the one or the other direction of the rope-pulley. In a variant form the racks are secured to opposite sides of the same guide.

8,871.—MANUFACTURE OF PRISM GLASS: *M. F. Ewen.*—For making glass with prismatical ridges a sheet of glass is cemented in a ribbed and heavy frame of metal which is laid on the table of a planing machine, and adjusting screws fasten a set of tools having ridged faces in another frame. The glass is moved to and fro underneath the tools for making the grooves, whilst moistened emery is applied to its surface, and polishing powder is used upon rollers laid end to end, or upon a single grooved leather roller.

8,888.—AN INSTRUMENT FOR DRAWING AND MEASURING ANGLES: *P. Jacolin.*—The instrument, which can be combined with a slide-rule, comprises a double blade to one end of which is pivoted a blade that can be folded within it, and is marked with a protractor and a tangent-line. At the end of the double blade, which is cut away so as to expose the protractor, are reading-marks, and graduations are set out upon the blades.

8,919.—MEANS OF MEASURING RELATIVE ANGULAR DISPLACEMENTS: *J. J. Guest.*—The single-reading apparatus is intended for the measurement of relative angular displacements, and may be combined with the ordinary optical means for taking observations by double reflection; the two mirrors are carried upon rods, which turn and slide in sleeves, and upon clamps.

8,934.—A SMOKE-CONSUMING APPLIANCE: *R. H. Burns.*—A ring-pipe, or similar chamber, provided with hanging funnels or tubes having pierced ends and sides, serves for the admission of air, or some other medium which will assist combustion, so as to mingle with the products of combustion in the hood or uptake of a vertical boiler. The funnels, which should be mounted upon ball-joints, have deflectors disposed underneath them.

8,941.—A FASTENING FOR WINDOW-SASHES: *D. Stewart.*—The meeting edges of the sashes are covered with a plate which is secured, in preference, to the lower sash and has a recess which may be formed by folding over the plate; to the other sash is pivoted a bolt which, when one wishes to fasten the window, is to be turned round into engagement with the recessed plate of which the overlapping part will prevent the bolt from being moved from outside the window. The sashes can be drawn to one another, and their rattling obviated, through the engagement of an inclined slot in the plate with a lug upon the bolt as the bolt is turned round.

8,946.—A CONTRIVANCE FOR VENTILATION: *J. S. Wrightnour.*—The inventor seeks to furnish means of evaporating nitrogen from liquid air, and utilising the remainder that has been evaporated so as to oxygenate the atmosphere of hospital wards, auditoria, and similar apartments. He fashions a container at the bottom of a vessel, into which liquid air is caused to flow. The lower part of the vessel is hermetically sealed around the container, and is composed of and covered with materials that will not readily conduct heat, such as lead, wool, glass, and so on, or glazed tiles having hollowed or porous interiors into which liquid air or its gases will percolate. Some good heat-conducting substance constitutes the upper portion of the vessel, in order that the nitrogen shall first evaporate as the liquid air flows from and over the bottom of the container. When the nitrogen has been drawn away, the oxygen that is left will flow through pipes into the space which is to be ventilated, and it may be heated as it flows through a metallic portion of the flexible pipe. A stand, having racks and a rod, and a pivoted back and bottom (in the shape of a chair), serves to support and tilt the vessel whilst the apparatus is doing its work.

8,994.—APPARATUS FOR WARMING BUILDINGS: *T. Whitwell.*—The inventor's object is to retain and utilise the water arising from condensation in hot-water circulating apparatus; a pipe conveys steam to the coil in the heater, and to the pipe or coil outlet is joined a steam pipe which another pipe through a non-return valve joins to the water space of the heater; the cistern has a pipe for the overflow (which may be returned into the steam boiler), and is connected to the cold end of the circulating pipes by means of a pipe that is U-shaped at the end and is fitted with a controlling valve.

9,063.—A LIFT VALVE: *A. Nixon.*—For a screw-down tap or valve is devised an especially packed valve disc, within which is placed a cone-shaped plug or packing formed of an admixture of antimony sulphide and asbestos, ground up with rubber dough, and moulded into the shape desired. The compound is described as being suitable for other kinds of valves.

MEETINGS.

SATURDAY, SEPTEMBER 14.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Southwark and Vauxhall Waterworks, Hampton. 3 p.m.

MONDAY, SEPTEMBER 16.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Priestley, B.A., on "Sanitary Law." III. 7 p.m.

WEDNESDAY, SEPTEMBER 18.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, B.A., on "Duties of a Sanitary Inspector: Outdoor." 7 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

FRIDAY, SEPTEMBER 20.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, B.A, on "Duties of a Sanitary Inspector: Indoor." 7 p.m.

SATURDAY, SEPTEMBER 21.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Wimbledon Sewage Works. 3 p.m.

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be deliver ed
Bridge, Blairgowrie	Perthshire County Council	Blyth & Westland, Civil Engineer, 135, George-street, Edinburgh	Sept. 17
Permanent Way Works	East Ham District Council	A. H. Campbell, Civil Engineer, Public Offices, East Ham	do.
Paving Works	Deptford Borough Council	V. Orchard, 20, Tanner's-hill, Deptford S.E.	do.
Water Main, Wallwood-street	Amble U.D.C.	W. Gibson, Surveyor, 31, Queen-street, Amble	do.
*Wood Paving Carriageways	London Corporation	The Engineer, Guildhall	do.
*Alterations to Underground Convenience	do.	do.	do.
*Asphalt Paving Works	do.	do	do.
*Wood Paving	Willesden District Council	O. Claude Robson, Public Offices, Dyne-road, Kilburn	do.
*Alterations to Laundries	Shoreditch Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-st., S.W	Sept. 18
Asphalt Works at Schools	Bolton School Board	G. Dickinson, School Board Offices, Bolton-upon-Dearne	do.
Main Drainage Works	Mytholmroyd (Yorks) U.D.C.	S. Shaw, Civil Engineer, Church-street Chambers, Dewsbury	do.
Water Supply Works, Yealmpton	Plympton St. Mary R.D.C.	F. W. Cleverton, 4, Buckland-terrace, Plymouth	do.
Road Works, &c.	Wimbledon U.D.C.	C. H. Cooper, C.E., Council Offices, The Broadway, Wimbledon	do.
*Surplus Breeze	Commercial Gas Company	Company's Offices, Stepney, E.	Sept. 19
Pipes, Castings, &c.	Bradford Corporation	F. Stevens, Town Hall, Bradford	do.
*Water Tank, Oakham; Timber Platforms, Child's Hill	Midland Railway Co.	Company's Architect, Cavendish House, Derby	do.
*Rebuilding Entrance Lodge, Hammersmith	Kensington, &c., School District	Guardians' Offices, Marloes-road, Kensington	Sept. 20
Road Works, King Henry's-road	Lewes Town Council	Borough Surveyor, Town Hall, Lewes	do.
Works at 9, 10, 11, and 12, Princes-street, Dorchester	Trustees	A. L. T. Tilley, Architect, Dorchester	Sept. 21
Schools and House, Clynderwen	Mynachlogddu School Board	W. J. Williams, 1, High-street, Cardigan	do.
*New Schools, Whaley Thorns	Bolsover School Board	Vallance & Westwick, Architects, Mansfield	Sept. 22
*Road Making and Lighting	Kingston-on-Thames Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames	Sept. 23
Staircases, &c., at Workhouse	Newcastle-under-Lyme Guardians	Chapman & Snape, Architects, Newcastle-under-Lyme	do.
*Supply of River Sand	Borough of St. Pancras	Borough Engineer, Town Hall, Pancras-road, N.W.	do.
*Pipe Surface Water Drain	Willesden District Council	O. Claude Robson, Engineer, Dyne-road, Kilburn, N.W.	Sept. 24
20 Cottages, Trealaw, Wales	New Century Building Club	A. O. Evans, Architect, Pontypridd	do.
*Kerbing, Channelling, &c., St. Ann's-road	Tottenham U.D.C.	Engineer to Council, Offices, 712, High-road, Tottenham	do.
*Making-up Roads	do.	do.	do.
*Electricity Works	Willesden District Council	O. Claude Robson, Public Offices, Dyne-road, Kilburn	do.
*Underground Convenience, Forest Gate	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	do.
*Making-up Streets	do.	do.	do.
*Painting Work at Hospital, Dagenham	do.	do.	do
*Making-up Roads, &c.	Wood Green U.D.C.	Surveyor to Council, Town Hall, Wood Green	Sept. 25
*Hospital Buildings, Royston	Royston, &c., Jt. Hospital Board	A. Paul MacAlister, Architect, 20, St. Andrew's-st., Cambridge	do.
*Wall	Lewisham Metropolitan Borough	Surveyor, Town Hall, Catford	Sept. 26
*Iron Fencing, carriage paid	do.	do.	do.
*Water Works, &c.	Stratton and Bude U.D.C.	Baldwin Latham, Parliament Mansions, Victoria-st., Westminster	do.
*New Roads, Muswell Hill	C. J. Hayter, Esq.	Vigers & Co., 4, Frederick's-place, Old Jewry, E.C.	Sept. 27
*New Coast Guard Buildings, Whitstable	Admiralty	Coast Guard Station, Whitstable	do.
Paving Works, Chipping Hill	Witham (Essex) U.D.C.	W. P. Perkins, Surveyor, Witham	Sept. 28
Tramway Works, &c.	Reading Corporation	J. Bowen, Civil Engineer, Town Hall, Reading	do.
*Shop Superstructure for Electrical Works, Stafford	Siemens Brothers & Co., Ltd.	Siemens Brothers & Co., Ltd., Woolwich	Sept. 30
*22 Houses for Working Classes	Heston and Isleworth U.D.C.	Engineer to Council, Town Hall, Hounslow	do.
Water Supply Works	Banff R.D.C.	J. Barron, Civil Engineer, 1, Bon Accord-street, Aberdeen	Oct. 1
*Workshops and Stores	Windsor Royal Gaslight Co.	Gas Offices, Windsor	do.
*Coast Guard Buildings, Bexhill	Admiralty	Coast Guard Station, Bexhill	Oct. 4
*Sewerage Works	Bideford Corporation	Baldwin Latham, Engineer, Parliament Mansions, Victoria-street	Oct. 5
Water Supply Works, Togan	Monaghan U.D.C.	J. H. M. Wilson, Civil Engineer, Monaghan	do.
Electric Lifts, &c.	London County Council	G. L. Gomme, County Hall, Spring Gardens, S.W.	Oct. 8
*Cottages, Totterdown Fields, Tooting	London County Council	Architect's Department, 18, Pall-mall East, S.W.	do.
*Extensions at Workhouse	King's Norton Union	Mansell & Mansell, Colmore Row, Birmingham	do.
Hospital, Pontypool	Hospital Committee	R. Williams, Architect, 10, Clifford-inn, London, E.C.	Oct. 10
Pier Extension, Rosslare, Fishguard, Pembrokeshire	.....	Mr. Otway, Engineer, Inchicore, Dublin	Oct. 15
Two Villas, Barnes-road, Castleford	Mr. J. Kershaw	Garside and Pennington, Architects, Wesley-street, Castleford	No date
Wesleyan Church, Cotgrave, Notts	.....	A. E. Lambert, Architect, 22, Park-row, Nottingham	do.
Sheds, Stabling, &c., Manchester-street, Luton	Mr. T. Sworder	A. Wilkinson, Architect, 84, Inkerman-street, Luton	do.
Church, Monkgate, York	.....	F. W. Dixon, Architect, Trevelyan Buildings, Manchester	do.
Well Sinking, Cardiff	.....	Proger & Sons, Trinity-street, Cardiff	do.
Additions to Store Premises, Newcastle-on-Tyne	St. Anthony's Co-operative Stores	T. E. Davidson, Architect, 14, Neville-street, Newcastle	do.
Additions to the Red Lion Inn, Nether Broughton	.....	Sands & Walker, Architects, Angel Row, Nottingham	do.
Additions to House, Pannal, Harrogate	Mr. J. Batchelor	Bland & Bown, Architects, Harrogate	do.
Four Villas, Park-avenue, Nottingham	.....	H. J. Price, Architect, 24, Low Pavement, Nottingham	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Surveyor of Highways and Markets Inspector	Spalding U.D.C.	125*l.* per annum	Sept. 23
*Architectural Assistant	Coventry Corporation	Not stated	do.
*Waste Inspector and Collector of Rentals	Hemel Hempstead W'works Com.	Not stated	do.
*Three Building Inspectors	Tottenham U.D.C.	150*l.* per annum each	Sept. 24

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vi. viii. x. & xxiv. Public Appointments, pp. xxi. & xxiv.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 24.—By FENN & Co. (at Colchester).

Peldon, Essex.—Haxell's and Tracey's Farm, 106 a. 2 r. 11 p., f. and c. £1,400

August 28.—By THORNBORROW & Co. (at Penrith).

Penrith, Cumberland.—Barrowgate, two shops, two houses, and cottage, f. 551

August 29.—By WHEELER & SON (at Sudbury).

Balmer, Essex.—Balli ngdon Hill, enclosures of arable land, 68 a. r. 38 p., f. 2,225

Middleton-rd., first, second, and third meadows, 17 a. 2 r. 25 p., f. 900

Five Acre Meadow and Quay Meadow, 11 a. 3 r. 3 p., f. 550

Middleton-rd., cottage and o a. 1 r. 7 p., f. 235

August 30.—By ALFRED J. BURROWS (at Hamstreet).

Hamstreet, Kent.—Pear Tree House and o a. 2 r. 25 p., f. 365

September 3.—By W. MARTIN & Co.

Dulwich.—Elsie-rd., Strathearne Villa, u.t. 71 3 yrs., g.r. 8*l.* 10s., r. 42*l.* £425

September 5.—By CHAS. ATKINS.

Lewisham.—17 and 19, Thornford-rd., f. r. 50*l.* .. 755

By NEWBON, EDWARDS, & SHEPHARD.

Stoke Newington.—47, Manor-rd., u.t. 73 yrs., g.r. 9*l.* 9s., r. 50*l.* 500

Ilford.—55, Argyle-rd., u.t. 992 yrs., g.r. 8*l.* 11s., r. 40*l.* 405

Holloway.—66, Isledon-rd., u.t. 50 yrs., g.r. 9*l.*, e.r. 50*l.* 395

Pentonville.—4, Lloyd-sq., u.t. 16 yrs., g.r. 8*l.* 5s., e.r. 48*l.* 210

September 5.—By NOTT, CARTWRIGHT, & ETCHES.

Tooting.—Mandrake-rd., f.g. rent 15*l.*, reversion in 83 yrs. 360

Wandsworth.—Burntwood-lane, Knaresborough, u.t. 79 yrs., g.r. 6*l.*, e.r. 34*l.* 300

Hampstead.—115, Broadhurst-gardens, u.t. 91 yrs., g.r. 21*l.* 2s. 1,900

Pimlico.—63, 63a, and 63b, Elizabeth-st., u.t. 13 yrs., g.r. 10*l.*, r. 262*l.* 400

Clapham.—1, 3, 5, and 7, Holland-st., u.t. 19 yrs., g.r. 80*l.*, r. 160*l.* £185

Lee.—44, Gilmore-rd., f.r. 34*l.* 500

Balham.—40, Gaskarth-rd., u.t. 89¾ yrs., g.r. 6*l.* 10s., r. 52*l.* 365

By WORSFOLD & HAYWARD (at Dover).

Dover, Kent.—30, Maison Dieu-rd., u.t. 59 yrs., g.r. 5*l.* 350

2 and 3, Barton-gdns., f. 720

145, Clarendon-pl., f. 215

7, Military-rd., f. 245

16, Magdala-rd., f. 200

Noah's Ark-rd., enclosure of building land, 11 a. 1 r. 23 p., f. 400

September 6.—By LOW & SMYTH.

Halesworth, Suffolk.—Hill House and 4 a. 3 r. 34 p., f. 1,760

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000 alongside, in river	
Rough Stocks and Grizzles	1 11 0	,,	,,
Facing Stocks	2 12 0	,,	,,
Shippers	2 8 0	,,	,,
Flettons	1 8 6	,, at railway depôt.	
Red Wire Cuts	1 14 6	,,	,,
Best Fareham Red	3 11 0	,,	,,
Best Red pressed Ruabon Facing	5 5 0	,,	,,
Best Blue Pressed Staffordshire	4 4 6	,,	,,
Do., Bullnose	4 9 0	,,	,,
Best Stourbridge Fire Bricks	4 2 6	,,	,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,,
Headers	12 0 0	,,	,,
Quoins, Bullnose, and Flats	17 0 0	,,	,,
Double Stretchers	19 0 0	,,	,,
Double Headers	16 0 0	,,	,,
One Side and two Ends	19 0 0	,,	,,
Two Sides and one End	20 0 0	,,	,,
Splays, Chamfered, Squints	20 0 0	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,,
Quoins, Bullnose, and Flats	14 0 0	,,	,,
Double Stretchers	15 0 0	,,	,,
Double Headers	14 0 0	,,	,,
One Side and two Ends	15 0 0	,,	,,
Two Sides and one End	15 0 0	,,	,,
plays, Chamfered, Squints	14 0 0	,,	,,
Seconds Quality White and Dipped Salt Glased	2 0 0	,,	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered
Thames Ballast	6 0	,,
Best Portland Cement	34 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered.
Stourbridge Fire-clay in sacks,	28s. od.	per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. dep't.
Bath ,,	1 7	,, ,,
Farleigh Down Bath	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,,	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks	2 1½	,, ,,
Red Corsehill ,,	2 5	,, ,,
Red Mansfield ,,	2 4½	,, ,,
Hard York in blocks	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt
,, ,, 6 in. Rubbed Ditto	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt
,, ,, ,, 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3-in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	10 15 0	,, ,,
16× 8 best ,,	6 2 6	,, ,,
20×10 best blue Portmadoc	10 18 0	,, ,,
16× 8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green	11 2 6	,, ,,
16× 8 ,, ,,	6 15 0	,, ,,
20×10 Permanent green	10 0 0	,, ,,
16× 8 ,, ,,	5 12 6	,, ,,

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000	at rly. depôt
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Foreign Sawn Boards—1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.
½ in.	1 0 0	,,
Fir timber: Best middling Dansig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (25 ft. average)	3 0 0	3 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 3 0	0 3 6

Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 14 0	0 16 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders ,, ,,	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
("And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

PRICES CURRENT (*Continued*).

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 17 6	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,, ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 4½	- - -
SOLDER—Plumbers' ,,	0 0 7	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

PLASTER, &c.

	s. d.		
Coarse Plaster	30 6	per ton	delivered.
Fine ,,	47 6	,,	,,
Superfine ,,	88 6	,,	,,
Coarse Keenes and Parian cement	55 0	,,	,,
Fine do. do.	75 0	,,	,,
Robinson's Fireproof Cement	50 0	,,	,,
Do. Fine white, finishing (Exclusive of the ordinary charge for sacks.	55 0	,,	,,
Whiting	27 0 to	30 0	,, ,,
Cow hair for plastering	£9 0 0		,, ,,

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered
,, ,, fourths	2¾d.	,, ,,
21 oz. thirds	3¾d.	,, ,,
,, ,, fourths	3¼d.	,, ,,
26 oz. thirds	5d.	,, ,,
,, ,, fourths	4¼d.	,, ,,
32 oz. thirds	6d.	,, ,,
,, ,, fourths	5¼d.	,, ,,
Fluted sheet, 15 oz.	3½d.	,, ,,
,, ,, 21 ,,	4¼d.	,, ,,
½ Hartley's Rolled Plate	3d.	,, '
⅜ ,, ,, ,,	3½d.	,, '
½ ,, ,,	4d.	,,

OILS, &c.

	£ s. d	
Raw Linseed Oil in pipes	per gallon	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Boiled ,, ,, in pipes	,,	0 3 0
,, ,, ,, in barrels	,,	0 3 1
,, ,, ,, in drums	,,	0 3 3
Turpentine, in barrels	,,	0 2 3
,, in drums	,,	0 2 5
Genuine Ground English White Lead	per ton	22 0 0
Red Lead, Dry	,,	22 10 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

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[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

AYLESBURY.—For rebuilding the Railway Tavern, Aylesbury. Mr. Guest Luckett, architect, Aylesbury:—
Senior & Clarke* £613
[Lowest of three tenders received.]

See also next page.

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HENDON.—For fully making-up Borthwick-road, Ravenshurst-avenue, and Cricklewood-lane wideni n ; ( ) Urban District Council of Hendon. Mr. S. Slater Grimley, Engineer :—

	Borthwick-road.	Ravenshurst-avenue.	Cricklewood-lane.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Meston & Hale, Harlesden	1,064 0 5*	830 17 0	736 16 2	2,621 13 7
Bentham & Co.	1,110 9 4	982 0 4	683 9 0	2,775 18 8
T. Adams, Wood Green	1,122 16 3	1,042 10 4*	769 1 0	2,934 7 7
Myers, Gilson, & Rose	1,178 6 6	1,081 4 2	755 7 9	3,014 18 5
H. Boyer, Paddington	—	—	717 7 6*	717 7 6
Surveyor's estimate, inclusive of all ironwork, &c., to be supplied by Council	1,128 19 5	1,026 14 7	795 6 2	—

BANGOR (Wales).—For alterations to 13, Dean-street. Mr. W. G. Williams, architect, 220, High-street, Bangor :—

R. & J. Williams	£519	Watkin Jones, Mount-street‡	£499
Wm. Parry, jun.	519		

‡ Recommended for acceptance.

BANGOR (Wales).—For the erection of lock-up premises, Upper Bangor, for Mr. D. Cameron. Mr. W. G. Williams, architect, 220, High-street, Bangor :—

R. & J. Williams	£766 0	Jones & Evans	£762 0
Watkin Jones	764 15	Wm. Parry, jun.*	755 0
R. Lewis	763 0		

BOSTON (Lincs).—For the erection of a cookery centre, Norfolk-street, for the School Board. Mr. Jas. Rowell, architect, Market-place, Boston :—

Parker & Son, Boston, Lincs* £1,929

BRISTOL.—For converting a dwelling-house into business premises. Mr. T. J. Moss-Flower, architect and surveyor, 28, Victoria-street, Westminster, and Scottish Buildings, Bristol :—

Denby & Co, Bristol* £729

[Exclusive of electric lighting, drainage, and plumbers' work.]

KILLYGORDON (Ireland).—For the erection of a shop and dwelling-house, for Messrs. Floyd & Co. Mr. J. M'Carry, architect, Stranorlar :—

Carpentry.—Patrick Diver, Donegal £769 10

Building.—Maxwell, McGrenghnan, & Co., Killygordon* 434 10

LEEDS.—For the execution of road works (tar macadam), Cross Flatts Park, for the Corporation :—

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MERRINGTON-LANE (Co. Durham).—For the erection of a mission hall, for the Rev. E. Fenton. Mr. S. Wilkinson, architect, Mosley Chambers, Newcastle :—

G. H. Bell	£877 15 3	J. Ross	£802 10 2
R. Telfer	826 10 0		

QUAINTON (Aylesbury, Bucks).—For carrying out a scheme of water supply to the Station-road, Quainton, for the Aylesbury Rural District Council. Mr. Guest Luckett, engineer, Aylesbury :—

Hill	£1,771 9 0	Ward & Cannon	£1,156 0 0
Harvey	1,398 10 0	Senior & Clarke	1,316 16 0
Rowell & Sons	1,131 11 2	Darlington	1,271 0 0
King, Grace, & Cannon, Quainton*	1,032 10 0	Mackrill & Sons	1,220 0 0
Young & Sons	1,214 16 3		

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Bank, Leicester.—Messrs. Everard & Pick, Architects ..... *Double-Page Ink-Photo.*
Cottages.—Mr. W. Curtis Green and Mr. R. C. Dickie, Architects ..... *Double-Page Photo-Litho.*
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Sanitary Engineering.

IN our issue of December 31, 1898, we reviewed at length the first edition of Colonel Moore's great work on "Sanitary Engineering," and now, less than three years later, the second edition* lies before us. This is not a mere reprint with minor alterations, but claims to have been "brought thoroughly up to date, so as to maintain the position it has gained as the standard work on sanitary engineering." The first edition formed a bulky volume; the second is still bulkier, containing 791 pages (an increase of 170), 860 illustrations in the text (an increase of 326), and ninety-two "large folding plates" (an increase of twenty-two). The principal additions to the text are in the chapters relating to sewage-purification and refuse-disposal, and in the hydraulic tables, but numerous additions have also been made in other chapters, particularly in those dealing with sewer-ventilation and sanitary apparatus.

In the preface to the new edition Colonel Moore states that "every endeavour has been made to profit by the hints and suggestions which have been received from a variety of sources," and we are glad to find that our own criticisms, almost without exception, have been of service. In the space of a single article it was, of course, impossible to draw attention to every erroneous or disputable statement in such a large work, and we regret to find that many such statements have been carried forward into the new edition, and unfortunately much of the new matter contains similar blemishes. The fact is that Colonel Moore relies too little on his own judgment and too much on that of persons financially interested in the fittings or processes which they recommend. The result is that some of the chapters are very much like merchants' catalogues, the advantages of an apparatus being greatly exaggerated and the defects as carefully concealed as those of a would-be-young old maid. These praises are not always sung within inverted commas, and they go forth to the world, therefore, as Colonel Moore's own deliberate judgment. This is unfortunate for Colonel Moore. There are several examples in chaps. ix. and x. We select one from the former chapter, p. 395. It is a description of a wash-down water-closet, illustrated in plate xxv., but which we will not particularise. The description begins:—"The manufacturers state that this is the only closet the basin of which [can*] be removed from the lead pedestal and trap, so that the plumber has full play to make a plumbing or wiped joint, and thereby doing away with the risky method of soldering a piece of lead pipe to the earthenware trap." Here we have the manufacturers' statement (grammar and all) which the reader will take for what it is worth, but there is nothing to show that the remaining eleven paragraphs (occupying twenty-four lines) are not Colonel Moore's own words. Without search we should not like to offer an opinion as to the correctness of the opening statement *at the time it was written*, although no doubt the manufacturers believed it to be true; but the statement is certainly not correct to-day, as closets with pottery basins and lead traps or half-traps are now made by a number of manufacturers of sanitary fittings. Two such closets with half-traps of lead are illustrated by Colonel Moore on the same plate, and the "Hygienic" closet, which is also illustrated on plate xxv., has been made for about twenty years with a complete trap of iron (as shown) or of lead; the latter form has apparently been forgotten by Colonel Moore, although it is on almost identical lines with that under notice, and is recommended by the inventor for identical reasons. Why, then, does Colonel Moore repeat without qualification the statement which we have quoted? Some of the remaining paragraphs—for all of which Colonel Moore is responsible, as there are no inverted commas—are also highly coloured. We need refer to one only:—"There is also a large surface of water in the basin and a deep water seal in the trap." The illustration is, with the exception of the base of the pedestal, a geometrical section, and is apparently printed from the manufacturers' block. No scale is given, but we may assume that the total height of the fitting is 17 in. or 18 in., and with this as our scale we find the "large surface of water in the basin" to be a circle 3½ in. in diameter, and the "deep water seal in the trap" to be ½ in.! Perhaps the drawing is incorrect, but if this is so, it lies between Colonel Moore and the manufacturers.

This, although a flagrant instance of the indiscriminate copying to which we have taken exception, is only one of many examples in the book, and the new edition is more full of them than the first. Thus, the special drain-pipes of a certain firm were praised in the first edition, but one paragraph was ushered in with the sentence—"The manufacturers state," and the seven special praises came after the words—"The following advantages are claimed for them." In the new edition the description is even more glowing, and has been amplified to twice the original length; but no space could be found for the two principal sentences we have just quoted; and, as if this was not enough, a paragraph has been added which is of such a nature that we quote it in full, with the exception of the proper names:—"Messrs. . . . . manufacture also every description of salt-glazed sanitary ware, in which the far-famed . . . . clays alone are used, thus ensuring only the highest class of impervious product. They make a speciality of 'tested pipes' and of various forms of patent joints, ... &c." We venture to style this "the puff direct."

Chap. vii., on "Ventilation," has been in part re-written, and has been extended from thirty-four to forty-seven pages. Much of the new matter consists of quotations,

* "Sanitary Engineering: A Practical Treatise on the Collection, Removal, and Final Disposal of Sewage, the Design and Construction of Works of Drainage and Sewerage, and the Disposal of House Refuse and Sewage Sludge, with numerous Hydraulic Tables, Formulæ, and Memoranda, &c." By Colonel E. C. S. Moore, R.E., M.San.I., author of "Sanitary Engineering Notes," &c., formerly Instructor in Estimating and Construction at the School of Military Engineering, Chatham. Second edition, revised and enlarged. London: B. T. Batsford. 1901.

* This word is accidentally omitted in the text.

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most of which are from the writings of authorities who have no axes of their own to grind, but others are of a less distinguished character. In the first edition there was a reasonable account of an apparatus for extracting and destroying "sewer gas" by means of heat. This reappears in the second edition, but fifteen pages further on a new quotation of two and a half pages begins, the author having the same name as the inventor of the apparatus just mentioned, and arriving at the conclusion that "the most perfect method of extraction is displacement by heat, when the extraction and destruction of the foul gases can be done at one and the same time." What Colonel Moore thinks of the special methods and apparatus which he mentions we are not able to discover; he is apparently content to let the student arrive at an independent conclusion. This is scarcely the part of a guide, philosopher, and friend, such as the author of a large and important work like this ought to be. Not content, however, with leaving to the student the initial difficulty of deciding between the opinions of the various authorities quoted, Colonel Moore has unfortunately rendered the decision more difficult by conflicting statements of his own. On p. 324 we read that sewer-ventilating shafts "not less than 6 in. in diameter are recommended to be led from the manholes, or shafts [*sic*], to the gables of adjoining buildings, or to ventilating lamp-posts." This paragraph and the figure illustrating it are copied exactly from the first edition. As the author does not state by whom this recommendation is given, and as the passage is not in inverted commas, we naturally conclude that the arrangement has his own approval, but in the *new* edition we read on the next page—"Air-shafts connected directly with the public sewer should never be fixed against any dwelling-house or building, nor within at least 20 ft. of any window or chimney." On the page facing this definite dictum is the illustration referred to, showing an exit drain "for foul air," carried from the crown of an egg-shaped sewer to the foot of a ventilation-shaft fixed to the gable-end of a building (apparently a house), and within about 4 ft. of a window. In both editions we are told that "inlets and outlets must, therefore, be considered as possibly acting alternately in any capacity, depending on the amount of friction set up at various times by the flow of sewage." The reason given is quite erroneous, and is now contradicted by a new paragraph on the same page (325), from which we learn that "the power of ventilating-shafts depends entirely on the difference of the pressure of the atmosphere at the outlet and inlet of the shaft, from which a deduction must be made for the loss caused by friction; this varies with the size of the shaft and the nature of the inner surface." In the former statement the "friction set up .... by the flow of sewage" is given as the controlling factor, while in the latter the power of extraction "depends entirely" on atmospheric pressure, modified to a slight extent by the friction of the air *in the ventilation shaft itself*. Colonel Moore's new statement as to the commanding influence of atmospheric pressure is, however, as erroneous as the old one about the friction of the sewage; the tests made by Mr. Horton, to which we referred him, and which he now quotes *in extenso*, ought to have enlightened him. "I have not noticed," says Mr. Horton (p. 349), "that the variation of atmospheric pressure makes any difference." We have not by any means exhausted the contradictions in the new matter inserted in this chapter, but we have said enough to show that the author is not yet sure of his ground. The reader will do well to study the quotations, but he had better leave the author's conflicting theories and the formulæ on p. 326 severely alone.

On the details of sanitary plumbing the author is almost as contradictory as he is on sewer ventilation. With reference to cast iron soil-pipes, it is said on p. 302 that they "should be at least 4 in. in diameter to obviate the risk of becoming choked," while on p. 304, in the paragraph entitled "Soil-pipes, Size of —," we read that "a 3-in. pipe is sufficient for this purpose [*i.e.*, for keeping them "clean and wholesome"] even where several water-closets discharge into it (fig. 176)." The figure shows six closets served by one soil-pipe. Waste-pipes are inadequately treated; on p. 307 we have the illuminating paragraph: "*Waste-pipes.* — Waste-pipes from small sinks and baths are often made of light lead piping, six pounds per foot run." The ventilation of waste-pipes is dismissed in twelve lines, commencing on p. 335. In one of the chapters on apparatus, we are told (p. 437) that "a trap of the class shown in fig. 250 or 251, p. 363, should be fixed immediately below the sink"; one of these is a Mason's trap, and the other the old pattern D-trap. This is clearly a slip in reference, and quite pardonable in the case of a large work like this. On p. 439 it is said that a pantry sink ought to be fitted with a trap "selected from those illustrated in fig. 312 or 313, p. 382." One of these is a w.c. trap with a 4½ in. inlet. Pantry sinks, we are told on page 438, "should not be less than 15 or 16 in. deep." Modern wastes and overflows for sinks are conspicuous by their absence.

The sections on baths and lavatories are almost equally inadequate and unsatisfactory. Copper baths, it is said, "are the most durable and retain heat better." This is very loosely expressed. On the next page (441) the author states that "all bath-wastes should discharge .... into an open channel leading to a self-cleansing drain-trap, such as are represented in figs. 289-293, pp. 374, 375." Of the two traps thus recommended, one is a deep silt-trap with perforated bucket, and is therefore not even intended to be self-cleansing. The size of lavatory wastes is dismissed in two lines, which are almost as enigmatical as sybilline leaves—"the waste-pipe from a lavatory basin should be large enough to admit of rapid discharge, and it is usually from 1 in. to 1¼ in. in diameter." We are also told (p. 446) that a certain lavatory basin, the waste-pipe of which is (according to the drawing) not more than 1¼ in. in diameter, "forms an efficient drain flusher." Perhaps Colonel Moore can explain how it comes to pass that a 4-in. drain is efficiently flushed by the discharge of 2 or 3 gallons of water through a 1¼-in. pipe, and how he reconciles this statement with the table on p. 449, where we are told that it is "generally considered necessary" to provide a chamber holding 30 or 40 gallons for the efficient flushing of a 4-in. drain. This table, by the way, is of very little use, as the length of the drain is not taken into consideration. No practical man would dream of fixing flushing chambers of the capacities stated in the table in connexion with short drains. In giving Mr. Adams's method of calculating the volume of water required for flushing sewers (p. 453), Colonel Moore includes the *length* of the sewer as one of the factors to be considered, although, with as little regard for grammar as the monks of Rheims, he says, "there is little actual data bearing upon sewer flushing available."

House drainage is, on the whole, more satisfactorily treated, but even here there are several inconsistencies and lapses from perfection. We read (p. 309) "drains should never be laid under buildings," and then we are told that where such drains are absolutely necessary they should be of cast iron. "Never" is a word not easily qualified; it would be better to use the Gilbertian phrase, "well, hardly ever." The author proceeds to say that cast-iron drain-pipes should be "coated inside and outside with Dr. Angus Smith's composition," forgetting that he has previously stated that the glass enamel now applied to iron pipes "is impervious to the action of sewer-gas, and renders the pipe as smooth as if it were made of glass." The connexion of the soil-pipe with the drain in plate xix. is made within the thickness of the wall, although there is an inspection-chamber outside the building within 2 ft. of the pipe; the correct method would be to carry the soil-pipe into this chamber. In plate xvii. two 4-in. "foul-air extracting shafts" of equal height are carried up from drains leading to one inspection-chamber; a plan ought to have been given showing the position of the two shafts in relation to the chamber. Two more quotations, and we have done with this part of the subject, although we have not by any means exhausted our black list:—"It is sometimes necessary, when the natural action is insufficient to induce an upward current of air in the ventilating-pipe, to employ a cowl." This is from p. 331. On p. 325 we read "inlets and outlets must therefore be considered as possibly acting alternately in any capacity." In other words, the natural action in every ventilating-pipe must be considered as sometimes insufficient to induce an upward current. Must every ventilating-pipe, therefore, be provided with a cowl? Fig. 210 and plates xvii. and xix. answer no. What, then, must be done? Shall we be wrong in concluding that every ventilating-pipe must be fitted with an anemometer, and day-and-night watchmen set to observe it, with definite instructions that, when "the natural action is insufficient to induce an upward current of air," the watchman on duty shall climb to the top of the pipe and place a cowl on it?

Probably it will be of service to Colonel Moore if we point out a few of the minor errors which we have discovered in the new edition. In the first edition (p. 24) and in the second edition (p. 33), we read that "in 1873 M. Liernur introduced his somewhat complicated vacuum system for the transmission and collection of sewage." In the new edition this system is described on pages 43-5, and we are told that "Liernur's Improved Pneumatic System" was introduced in 1868, and first employed at Amsterdam in 1871. The reference on p. 215 should be to p. 56, not 47. It

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is a mistake to say (p. 239) that to make drain-pipes 3 ft. long "is only practicable for the larger diameters"; even 4-in. pipes are now made 3 ft. long "*ex* socket." Whether stoneware pipes more than 18 in. in diameter may be used for sewers, depends upon the strength of the pipes and other circumstances; such pipes have been satisfactorily used up to 3 ft. in diameter. We have already drawn attention to Colonel Moore's method of writing on water-closets, and need only quote his statement (copied from the first edition) that "wash-out closets. . . . are in great demand" to show that the revision is not by any means as thorough as it ought to have been.

Let us now turn to sewage disposal. In the first edition there was one chapter on this subject, occupying 107 pages. In the new edition two chapters, with an aggregate of 163 pages, are devoted to it, namely, chaps. xiv. and xv., the latter dealing entirely with bacteriolysis. This chapter contains 105 pages, or, strictly speaking, 104¼—very nearly twice as many as the subject occupied in the first edition. If from these 104¼ pages we deduct the six pages of illustrations (none of them original), we have a residue of 98¼ pages of text, of which about 83¼ are admitted to be either quotations from existing works or written by persons other than Colonel Moore. The remaining fifteen pages are almost entirely occupied by condensed accounts of experiments and apparatus; the first page only appears to contain strictly original matter by the author of the book, and this is a summary of the defects of treating sewage on land and by chemicals. The first quotation consists of a paper read by Sir Douglas Galton before the Sanitary Institute in December, 1895, together with the discussion thereon, and extends from p. 574 to p. 593. Thirteen pages are occupied by Colonel Waring's description of bacteriolysis and his apparatus, and tests in connexion therewith. We need not particularise the remaining quotations. Some of them are written by patentees or other persons interested in the processes and apparatus described. We merely state this as a fact, without any reflection on the value of their contributions. But, we ask, how are we to review or criticise a chapter like this? The so-called author of the book is scarcely in evidence from the beginning of the chapter to the end. All we can do is to criticise his *method* of book-making. Surely it was within his powers to have written a succinct account of the processes involved, and then to have gone on to describe the different kinds of apparatus, instead of letting different writers repeat *ad nauseam* the very elements of the subject. The chapter might thus have been reduced nearly one-half, and would have formed a consistent whole, instead of being, as it now is, a heterogeneous collection of extracts from trade circulars and the author's commonplace book.

We regretfully come to the conclusion, therefore, that the second edition of this large book has not gained in value as much as it has gained in bulk. Like the first edition, it contains a vast amount of extremely useful information, but there is too much book-making about it and too little authorship. We do not wish to leave a wrong impression, and it is with pleasure that we draw attention to the voluminous labour-saving tables, which are such an important feature of the work; to the numerous illustrations and descriptions of sanitary apparatus, from household fittings and drains to sewers, sewage-disposal works, and refuse-destructors; and to the convenient collection, within one volume, of the opinions of so many sanitarians, distinguished and otherwise.

NOTES.

The New Government Offices.

IN Tuesday's *Times* Mr. Leonard Stokes, who is one of the late Mr. Brydon's executors, returned to the charge in regard to the proposed carrying out of the Government Offices by the Office of Works, in an admirable and forcible letter, in which he replied to the absurd statements made in the communication to the *Times* "From a Correspondent," to which reference has already been made in our columns. We are glad to be able to add that his letter was enforced by another excellent and sensible leading article in the *Times* of the same date, putting the case as well and as strongly as it could possibly be put. As the writer says, if Sir John Taylor is an eminent architect competent to carry out a great piece of architecture of this kind, why was he not originally named and included among the list of architects whose names were first suggested for the work? The Government never proposed him then; they wrote to the Institute of Architects to recommend a list of names for the War and Government Offices. We have no desire to say a word against Sir John Taylor, who as a Government official (and a very able one in a practical sense) is bound to carry out the orders of his official chief. The *Times* goes on to remark that if we desired to have an Office of Works to design great buildings we should of course put at its head and into the ranks of its officials the most eminent architectural talent of the day:—

"To such a department we might perhaps safely entrust the expression of the national taste in architecture. To the Office of Works, as at present constituted, we can entrust nothing of the kind. Its whole conception of a public building appears to be that of a builder, not of an architect. It is not even actuated, we are assured, by a zeal, laudable in itself though deplorable in the particular application, for public economy. It proposes to take a course not less costly than that which commends itself universally to professional and enlightened opinion, and to take it, so far as we can see, out of sheer lack of artistic perception. For this is really all that the argument of its apologist comes to. If you can only get a distinguished architect to make a pretty drawing and leave a few unfinished sketches, all the rest can be done by a draughtsman, a couple of departmental officials, and a competent builder. We can only say that no great public building ever was, or ever can be, produced in this way."

It is encouraging to find such a line as this taken by the leading journal. For many years the *Times* seemed to be under a kind of hereditary disposition to scout architecture and architects, and little was admitted into its columns on such subjects beyond the Philistine amenities of Lord Grimthorpe. We may congratulate our great contemporary on having at last taken up a line in regard to public architecture which will earn for it the gratitude and sympathy of all artists.

Sir John Gorst on Education.

IT would have been more satisfactory if Sir John Gorst, as President of the Educational Section of the British Association, had last week in his address endeavoured to give some scientific and statistical view of English education rather than deliver a mere desultory essay. No one perceives more keenly than the Vice-President of the Council the weak places in our system of national education, and no one seems to take more pleasure in pointing them out, at the same time abstaining from giving us remedies. Perhaps the most important point of the address was the clear manner in which Sir John Gorst stated what cannot be too often repeated, that it is useless to hope for good results from technical and secondary schools until elementary education is thoroughly sound. "Classes and schools spring up like mushrooms, which profess to give instruction in the lacking branch of applied science to scholars who have no elementary knowledge of the particular science, and whose general capacities have never been sufficiently developed. Science cannot be taught to those who cannot read, nor commerce to those who cannot write." These and more like them were the statements of the Minister of Education. Practical men would say that if such is the opinion of this official he should enthusiastically and strenuously labour to improve the elementary education of England. But, unfortunately, Sir John Gorst regards it rather from the point of view of the philosopher than of the administrator.

Subways for Underground Pipes.

PLAINTIVE suggestions are made from time to time that the system of subways inaugurated in the City some years ago should be extended to all parts of the metropolis, but no one expects any practical result from such appeals. The number of companies privileged to interrupt traffic by tearing up streets is steadily on the increase, and corporations of this kind seem to grow more fastidious year by year. At one time any old roadway served to gratify their destructive instincts, but in the present day nothing less than a newly-laid pavement will suffice. It is perhaps not to be expected that the welfare of the community should influence the operations of a public company, although consideration for the pockets of shareholders might be looked for. If gas, water, electric and other mains could be laid, altered, or repaired during the renovation of a road surface, some saving would certainly be effected. The fascination exercised by the pastime of road-wrecking must be as powerful as it is mysterious, otherwise pecuniary advantage would never be relinquished for the empty pleasure of spoiling smoothly-paved streets by digging out and filling in trenches, the traces of which frequently remain more or less permanently in the form of irregularities and projections above the normal surface level. Much as the public may desire to see the establishment of subways, nothing can be done without legislation, for the streets have been given up by Parliament to numerous companies who are duly authorised to break them up and to play havoc with traffic at will. A similar problem now confronts the municipal authorities of New York City, where various conduits are buried in any sort of fashion beneath the streets. Referring to this important question, the *Scientific American* says: "It is a pitiful commentary upon our supposed twentieth century development that these mains should be buried beneath the streets

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in altogether haphazard fashion." The rapid transit tunnel would have included provision for water, gas, and other mains in roomy galleries had not opposition been offered by the sewer, gas, and water departments, who raised objections that are characterised by our contemporary as being of a trifling nature. At present, therefore, the pipes are merely suspended from falsework during the construction of the tunnel, and after a section is completed, the soil is filled in around the pipes, leaving them in the usual undesirable state, which requires disturbance of the roadway whenever repairs or other attention is needed. So we find the *vis inertiæ* of vested interests is already a factor to be reckoned with even in New York, where people affect surprise at the slow growth of municipal reforms in London. The fact is that in all great cities there is urgent need for a constantly progressive policy, and this will only be seriously considered when the authorities find the public to be emphatic as to the necessity for its adoption.

The New Redheugh Bridge, Newcastle-on-Tyne.

THE old Redheugh Bridge between Newcastle and Gateshead, erected in 1871, has recently been replaced by a new structure built from the designs of Messrs. Sandeman & Moncrieff, MM.Inst.,C.E., of Newcastle, and the work involved a most interesting and probably unprecedented engineering feat, deserving more than passing notice. The old bridge was of the suspension type, having masonry approaches, one at Newcastle 216 ft. long, and the other at Gateshead, 132 ft. long. There were three river piers and four spans, two of 168 ft. and two of 252 ft., the total length of the bridge and approaches being 1,187 ft. For various reasons it was found necessary to build the new bridge on the old site, and this task was successfully accomplished without stopping foot traffic for a single day, and without interrupting vehicular traffic until the work was nearly completed. The foundations of the new river piers each included four cylinders, two being disposed on either side of each old foundation; the river piers were built up outside the old piers and braced together as far as possible. During the conduct of this work, the approach arches at each end were centred and taken down simultaneously, the roadways having been previously shored up. The masonry of the piers and abutments was then built up as to half the width to the required level, and half the width of the new girders, superstructure, and roadway were finished, the other half being afterwards dealt with in a similar manner. Then the main girders of the river spans were built out as cantilevers from the new pier heads, the projecting ends of the two longer girders were joined at the centres of the spans, and the two shorter girders were built out entirely as cantilevers, reaching from the outer river piers to the masonry approach piers. But the girders were not erected in their final position, as the centre line of each was 4 ft. 6 in. away from the centre line of the river piers, and they were slightly higher than the proper level. This mode of procedure was rendered possible by the large cross girders joining the pairs of columns forming the river piers. When the four spans had been practically finished, the entire structure of the old bridge was taken down, all hitherto uncompleted bracing was put in, and the main girders—weighing about 1,600 tons—were moved over horizontally by means of hydraulic jacks. This operation was commenced early on the morning of May 6 last, and so carefully had all the details been thought out that the work of shifting the girders only occupied a few hours. The spans were then adjusted to a uniform gradient and line, and the fixed and roller bearings were inserted. Afterwards the flooring, roadway, and footpaths were finished, and the new gas and water mains, which had been temporarily uncoupled, were joined up. The new Redheugh bridge is of unpretentious design, but it has the merit of looking exactly what it is—a steel-girder bridge; and further, the skilful manner in which all the details of construction have been designed and executed reflect the greatest possible credit upon the engineers and upon Sir W. Arrol & Co, the contractors.

A New Departure in Gas Manufacture.

THE Gas Section of the International Engineering Congress held last week at Glasgow was presided over by Mr. George Livesey. In his address Mr. Livesey pointed out that "consumers now have it in their power to get out of 5 cubic feet of gas per hour anything from five to 150 candles from ordinary coal-gas, whether it be nominally ten, fifteen, or twenty so-called candle-power," and exclaimed, "What a useless absurdity does this make of all illuminating power tests!" We quite agree that, owing to the introduction of the incandescent gas light and the extensive use of gas for heating, the so-called illuminating power has become a matter of secondary importance as compared with heating power; but until Parliament has fixed a standard calorific value to take the place of the present illuminating power standard we think it would be inimical to the interests of gas consumers to allow the illuminating power tests to be abandoned. Professor Vivian B. Lewes read a paper on "The Utilisation of Water-Gas in the Destructive Distillation of Coal," in which he described a new method of gas manufacture by which low-grade gas of high calorific value can be made more cheaply than has hitherto been possible. The coal is heated in retorts in the usual manner; but while carbonisation is being carried on a rapid stream of non-luminous water-gas is passed through the retorts in order to push the coal-gas out of the zone of heat before its richest illuminating hydro-carbons have been decomposed into products of less value. By adding 40 per cent. of water-gas (costing 3½d. per 1,000 cubic feet) in this manner, a mixture is obtained which has a heating value about 15 per cent. lower than ordinary coal-gas of good quality, and an illuminating power about one and a half candles lower. The ordinary consumer would probably not detect any difference between this mixture and ordinary coal-gas. In view of the excessive cost of the gas supplied by the Gas Light and Coke Company on the north side of the Thames, it is to be hoped that this company will lose no time in obtaining Parliamentary sanction for a reduction of the standard illuminating power, and by adopting this new process make a substantial reduction in the price charged to consumers. The economy effected by the new process has been found by working on a fairly large scale to be 2s. 1d. per ton of coal carbonised, and as the quantity of coal used by the London gas companies amounts to four million tons per annum, the economy effected in London alone would exceed 400,000*l.* a year.

Superheated Steam in Radiators.

IN a paper read before the American Society of Heating and Ventilating Engineers, Professor R. C. Carpenter directs attention to a curious effect due to the accidental presence of superheated steam in some radiators tested by him in the spring of 1901. The radiators were placed on a platform about 2 ft. above the floor, so that vessels might be employed for receiving the water of condensation. Steam was furnished from a high-pressure main, having passed through a separator to remove free water, and thence through a reducing valve for the regulation of pressure. Temperatures were taken of the outside air and at several places in the compartment where the tests were conducted, the temperatures of steam condensed and of the radiator surfaces being also recorded and the water of condensation was carefully weighed after being cooled. It appears that the process of reducing the pressure caused wire-drawing of the steam, thus liberating a considerable amount of energy which was expended in superheating the steam, and, contrary to expectation, the result was clearly to reduce the quantity of heat transmitted by the radiators. Expressing heat transmission in British thermal units per hour, per square foot of surface, per degree difference of temperature, the following effects were ascertained: With one radiator using saturated steam at 2 lbs. pressure, the heat transmission was 1·48; when using steam at the same pressure, but with 36 deg. superheat, the transmission only reached 1·16. With the other radiator a corresponding loss of efficiency, from 1·83 to 1·41, took place. Similar experiments were made with steam at 5 lbs. and 10 lbs. pressure with varying degrees of superheat, and in every instance decrease of heat transmission followed the increase of superheat. It is, therefore, manifest that superheated steam is a very undesirable medium for warming purposes, probably for the reason that in this state the vapour of water has the properties of a perfect gas, and parts with its heat less rapidly than when it is in the ordinary or saturated condition.

Buckinghamshire Roads.

THE annual Report of the County Surveyor, Mr. R. J. Thomas, on the highways of the county of Bucks is of more than local importance. Mr. Thomas has a high reputation as a road administrator, and the Report which he issues enables an opinion to be formed of the progress of English highways. For the county of Bucks is of a varied character, and highways of every kind are to be found in it. From the chart showing the cost per mile of the Bucks main roads for the twelve months ending March in each year since 1886, we obtain a clear idea of the results of recent legislation. In 1887, 1888, and 1889 the roads were under parish management, and the cost for each of these years was 65*l.*, 67*l.*, and 62*l.* respectively. In 1891, the second year of the administration by the County Council, the cost had fallen to 53*l.* Then came a period of exceptional expenditure on

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materials, so that in 1893 the cost was 75*l.* per mile. It then fell rapidly, so that in 1896 it was only 52*l.*, and has since kept almost this level, though in 1901 it rose to 53*l.* It is thus clear that an exceptional expenditure on highways, so as to place them in a thoroughly sound condition, is far more economical in the long run than a niggardly policy; and it is also clear that the main roads of Buckinghamshire are now kept in a better condition and at a less cost than under the less intelligent and amateur management of parish surveyors. The practical moral to be deduced from this Report is that the County Council should be the sole highway authority for every county.

Restoration Work at Oxford.

RESTORATION work of some importance in now in progress at Oxford, both at Christchurch and at Merton. At the latter the front of the north transept of the chapel is undergoing repair, being as far as can be ascertained, refaced. At Christchurch two pinnacles are being added to the east end of the cathedral, at present wooden patterns being erected at which, of course, plenty of adverse criticism is directed. The east side of the well-known Tom bell-tower is also being restored. The work at Christchurch is under the advice of Mr. Bodley, and at the cost of two members of the college. It is satisfactory to note this generosity, for of late the pious benefactor has not been much in evidence at the Universities, and his assistance is needed as much now as in former days. Of course there are some who would prefer that ancient buildings should remain untouched, but in regard to many the time must inevitably arrive when work must be done upon them if they are to be preserved for future generations. Nothing is, indeed, more striking at Oxford to-day than the decayed state of much of the stonework, many of the details of the sculptures and carving being quite obliterated by time.

Dryden's House in Soho.

WE notice that house-breakers are at work upon the demolition of No. 43, Gerrard-street, Soho, which it seems had fallen into decay. The only part standing when we last saw it was the basement, and above it "the ground-room, next the street," in which, as Pope records, Dryden "used most commonly to write." The house is that to which Dryden removed from Long Acre in 1686, and where he wrote "The Hind and the Panther," his first Ode for St. Cecilia's Day, "Alexander's Feast," the version of Virgil; the "Fables," and several dramas including "King Arthur" and "Don Sebastian." At that time the back windows of the house gave a view of the gardens of Leicester House. Dryden died at No. 43, Gerrard-street, on May 1, 1700. A collection of extracts made some years ago from the rate-books of St. Anne, Soho, shows that Dryden when living there was rated at the sum of 11s. 3d., and that his widow, Lady Elizabeth Dryden (whose name, by the way, is entered as "Madam Dryden") continued to occupy the house, being rated at 12s. The street had been built in or about 1680 upon some land which had formed the military exercise and artillery ground of Henry, Prince of Wales, and afterwards became the property of Charles Gerard, Earl of Macclesfield. The street was a fashionable quarter at one time. In a period of thirty years reckoned from 1691 were rated (with other notable persons) the Earl of Manchester (1693), "Earle Maxfielde" and Lord Wharton (1700), Lord Mohun (1706), General Holmes and Colonel Brett (1711), Lord Howe, the Countess of Suffolk, the Duke of Norfolk, Lord Kerr, and the Earl of Scarbrough (1711); and Lady Maynard (1721). Lord Macclesfield's house, on the south side, was consumed by fire on August 10, 1887.

The Photographic Salon.

THE ninth exhibition of the Photographic Salon, which professes to illustrate photography as a fine art, is open at the Dudley Gallery. The means by which this is done in many cases seems to be either to make a faulty photograph, out of focus and blurred, or to work up the photograph until it ceases to be properly speaking a photograph, and becomes something else. Thus Mr. Moss's "Tidal River" and Mr. Bourgeois' "The Clyde, Glasgow" appear to be worked on afterwards; the lights on the water in the latter have all the appearance of being put on by hand. Mr. Hinton's "Recessional" has the appearance of a mezzotint; what process it has gone through we do not understand, but a pure photograph in the ordinary sense it is not. Dr. Henneberg's "Fishing Boat" and others seem to have been made up in a somewhat similar manner; Mr. Davison's "Lucerne" is apparently out of focus and all misty and uncertain. Then we have photographs that look as if they were made on canvas, and others that seem to be made on blotting-paper. But these contrivances to make a photograph look like brush-work only serve to remind one how much better and more interesting brush-work is. Some photographs of sprays of flowers would be very useful as studies for artists; in themselves they have not the value of a drawing; the only one which has some claim to be a work of art is perhaps Mrs. Cadby's "Snowdrops," on account of the care which has been taken in combining the delicate white flowers with the delicate greyish background. Mr. Keighley's "The White Sail," in which a drooping sail of a boat aground is backed by the curved wall of the pier, is a good piece of composition; and in composition there is something to be done in photography; the photographer may choose a better or worse point of view, or he may group or pose a figure well or ill. In this respect, however, the natural man is more recusant in real life than he is in the hands of the painter, and it is rarely that we find a photographic group or figure as well posed as a painter will do it, who can to some extent create the pose he wants. And on the whole we prefer good photographs which are simply photographs to those which try to be something else. There is Mr. Craig Annan's really fine portrait of Professor Young, for instance, and Mr. Hollyer's of Captain Hutton; most satisfactory examples of photographic portraiture. An open air study by D. Spitzer, of a powerful naked man carrying a stone up a hill (we wonder it is not called "Sisyphus"), is a good piece of work. As we have before complained, architecture, the class of subject best of all suited to photography, is nearly ignored. Mr. H. H. Hopkins, however, shows a clear little photograph of "Varenna," Mr. F. H. Evans a little miniature interior of Bourges, "Height and Light," which is very successful; and Mr. H. W. Bennett an interior, "In an Old Church," which we take to be St. Albans.

NOTES ON THE BRITISH ASSOCIATION MEETING.

PROFESSOR RÜCKER'S inaugural address, more concentrated as to subject and more popularly comprehensible than some Presidential addresses on these occasions, afforded an admirable summary of what may be called the greatest step in recent times towards a true conception of the mechanism of matter—that matter which is the constituent of the universe and the substratum of life. Most of what he said as to the atomic theory of matter, or what he called in one passage of the address the "coarse-grained character of matter,"* should by this time be familiar to all who, even without claiming to be physical scientists themselves, have kept an intelligent eye on the progress of scientific conception and reasoning. For it is by reasoning rather than observation that the atomic theory has been established, as it may now be said to be; at all events, as Dr. Rücker put it, "the atomic theory must hold the field until another can be found which is not inferior as an explanation of the fundamental difficulties as to the constitution of matter." For that is the only test we can have of the truth of a theory which deals with conjectured atoms invisible to sight: does it offer the best-known explanation of the phenomena that are visible? In this light, the atomic theory seems justified at every turn. It meets us as the rational explanation of the interpenetration of gases and fluids, by an analysis of the same order as that which has apparently solved the question of the mechanical stability—even possibility—of Saturn's rings. No telescope has brought us near enough to Saturn's rings, or probably ever will, to enable us to form any judgment from the appearance of their surface as to their constitution; but analysis has shown that their constitution and stability are explicable on the theory that they are composed of small particles with independent motion; and, so far, on no other theory. These are not "atoms," of course; they may be comparatively large particles; but the process of reasoning applied to them is the same; it is the atomic theory on a magnified scale. Late as this discovery is, comparatively speaking, it may already pass as a scientific commonplace. One or two illustrations not so familiar were cited in the course of the address. The most striking of these is the experiment of Sir W. Roberts-Austen, who placed pieces of gold and lead in contact at a temperature of 18 deg. C. "After four years the gold had travelled into the lead to such an extent that not only were the two metals united, but, on analysis, appreciable quantities of the gold were detected even at a distance of more than 5 millimètres from the common surface. . . . Whether it is or is not possible to devise any other intelligible account of the cause of such phenomena, it is certain that a simple and adequate explanation is found in the hypothesis that matter consists of discrete parts in a state of motion, which can penetrate into the spaces between the corresponding parts of surrounding bodies." A very little thought will show that any theory which regards the lead and the gold as close and compact substances entirely united is absolutely at variance with this ascertained fact of interpenetration. The deductions from one such observed fact are wide-reaching, and must affect our whole conception as to matter. Where we are brought up is when we attempt to step from the conception of inanimate matter to that of life. "Perhaps," observed the President, "the chief objection which can be brought against physical theories is that they deal only with the inanimate side of Nature, and largely ignore the phenomena of life." But is not the step here referred to the eternally impassable one—the "Thus far shalt thou go and no farther" addressed to the human intellect. As to the mechanics of

* Those who were present at the remarkable Friday evening lecture given at the Royal Institution a good many years ago by Lord Kelvin (then Sir W. Thompson), may remember his illustration of the atomic structure and movement in matter by means of a number of ivory balls hung on a level and at equal distances by long threads from the ceiling, and which all entered into movement from an impulse given to one of them.

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matter we may look to continually increase our range of observation and knowledge, but the mystery of *life* will still remain the Sphinx whose riddle none may hope to read.

Considerations as to the constitution and mechanics of matter will hardly, it is true, affect architects practically in dealing with construction; but they serve to give us a clearer idea of the nature of the material universe which is our basis of life, and therefore they should be of interest to all thinking persons, of whatsoever profession. In our notes on the remainder of the proceedings, we must confine ourselves to the papers on subjects of more direct interest to our readers. In the Geographical Section the President of the section, Dr. H. R. Mill, took for his subject "Research in Geographical Science," in the course of which he thus defined the principles of geography * :—

"The science of geography was, of course, based on the mathematical properties of a rotating sphere; but if they defined geography as the exact and organised knowledge of the distribution of phenomena on the surface of the earth, they saw the force of Kant's classification, which subordinated mathematical to physical geography. The vertical relief of the earth's crust showed them the grand and fundamental contrast between the oceanic hollow and the continental ridges; and the hydrosphere was so guided by gravitation as to fill the hollow and rise upon the slopes of the ridges to a height depending on its volume, thus introducing the great superficial separation into land and sea. The movements of the water of the ocean were guided in every particular by the relief of the sea-bed and the configuration of the coast lines. Even the distribution of the atmosphere over the earth's surface was affected by the relief of the crust, the direction and force of the winds being largely dominated by the form of the land over which they blew. The different physical constitution of land, water, and air, especially the great difference between the specific heat and conductivity or diathermancy of the three, caused changes in the distribution of the sun's heat, and as a result the simple climatic zones and rhythmic seasons of the mathematical sphere were distorted out of all their primitive simplicity. The whole irregular distribution of rainfall and aridity, of permanent, seasonal, and variable winds, of sea climate and land climate, was the resultant of the guiding action of land forms on the air and water currents, disturbed in that way from their primitive theoretical circulation. So far, they saw that the surface forms of the earth, themselves largely the result of the action of climatic forces, and constantly undergoing change in a definite direction, controlled the two great systems of fluid circulation. Those in turn controlled the distribution of plants and animals, in conjunction with the direct action of surface relief, the natural regions and climatic belts dictating the distribution of living creatures. A more complicated state of things was found when the combined physical and biological environment was studied in its incidence on the distribution of the human race, the areas of human settlement, and the lines of human communications. The complication arose partly from the fact that each of the successive earlier environments acted both independently and collectively; but the difficulty was in greater degree due to the circumstance that man alone amongst animals was capable of reacting on his environment and deliberately modifying the conditions which controlled him. It seemed to him that the glory of geography as a science, the fascination of geography as a study, and the value of geography in practical affairs were all due to the recognition of that unifying influence of surface relief in controlling, though in the higher developments rather by suggestion than dictation, the incidence of every mobile distribution on the earth's surface."

Following out this idea, geographical study might be classified into geomorphology, dealing with the forms of the solid crust of the earth; oceanography, dealing with the masses of water on the globe; and climatology, dealing with the effects of solar energy in the air. Considering the subject of geography and the State, he believed that geography would be found to afford an important clue to the solution of every problem affecting the mutual relations of land and people, enlightening the course of history, anticipating the trend of political movements, and indicating the direction of sound industrial and commercial development. Unfortunately, it would be easy to enumerate misconceptions of history, blunders in boundary settlements, errors in foreign policy, useless and wasteful wars, mistakes in legislation, failures in commercial enterprise, and lost opportunities in every sphere, which were due to the neglect of such a theoretical geography. Surely it was to the laws defining the interaction of nature and man that they should turn for guidance in such affairs, rather than to the dull old British doctrine of "muddling through."

In connexion with this subject Dr. Mill complained of the serious omission in the Ordnance Survey, that the extension of the survey to the lake-beds should have been forbidden on the score of expense, and spoke with satisfaction of the prospect of this totally indefensible omission being made up for by a survey of the lake-beds which was proposed to be carried out as a private enterprise by Sir John Murray and Mr. Laurence Pullar. At the conclusion of his address Dr. Mill warned his hearers that this country was not in a satisfactory state in regard to geographical work. The best work of some of our cartographers in Edinburgh and London need fear no comparison; but in the main it could not be denied that Germany led the world in map-making. It would be interesting to know how many pennies in the income-tax would have been saved had we been possessed, in the present war, of fuller and better maps of the country, resulting from a survey of South Africa carried out as an Imperial duty when Cape Colony was settled. The survey would not have prevented the war, but it would have shortened it by some months. Meteorological surveys would also become of increasing national importance in view of the probability that wind and water would be more used in future in industrial enterprises, and the Government ought to place our great national industries, in this respect, on a basis of scientific knowledge.

At a further meeting of the section Mr. Chisholm read a paper on "Geographical Conditions Affecting British Trade," in the course of which he alluded to the great advantages which those countries would have, in the near future, which possessed the greatest natural opportunities for the development and use of water power; Switzerland, Norway, Italy, Canada, and the United States being in this respect all more advantageously circumstanced than Great Britain. Italy, in particular, which since the opening of the Suez Canal held a very favourable commercial situation, was developing the resources of water power largely, and might thus be able to develop a great trade based on her own resources. In answer to a question as to the effect on England of a successful completion of the Panama Canal, Mr. Chisholm thought it would tend more to the advantage of the eastern seaboard of the United States than of this country, but he would not say that Great Britain would not benefit at all by the carrying out of such a work. At a further meeting of the Section Professor Smith read an interesting paper on the botanical survey of Scotland. The 1-in. maps of the Ordnance Survey had been used for the full work, the 6-in. maps for smaller areas. One object was to mark the different associations of plants, and the dominant species, in each area. On the sea-level was the maritime or littoral association. Then came the cultivated land, which was rather difficult to deal with, being too much under the influence of man. It was divided into two classes, a better class on which wheat was grown, and the poorer class where wheat did not enter into the rotation. The vegetation on the arable land was marked, and the woodlands were also recorded—oak, pine, and on Scotch maps larch. The heather moorlands were recorded by a different colour, and the grasses again by another. Above the 2,000-ft. line the heather gave out, and the blaeberry association became dominant. Above the 3,000-ft. line was the Alpine plateau, on which it was difficult to say what was the dominant species.

In the course of the discussion, the President pointed out that by the study of plants which resisted erosion and the movement of sand dunes the Emperor Napoleon hit upon the idea of binding together a part of the coast of France with the result that had had enormous practical value. Some years ago, too, a British General, when visiting a newly-erected fortress on the coast, asked the officer in command why the mound was so bare. He was told that grass had been tried upon it but would not grow. He replied, "Sow no more grass, but go along the coast and find out what plants are growing there naturally. Get them and plant them." This certainly suggests a very practical application of the knowledge of geographical distribution of vegetation.

On the subject of the Lakes of the British Isles a special conference was held at a later period of the meeting, a joint conference of the Geological, Zoological, and Geographical sections, at the close of which a resolution was passed expressing the gratification of the conference that the work of this amateur survey would be carried on under the direction of Sir John Murray, and also their sense of the munificence of Mr. Pullar, who it is understood is providing the funds for the work.

The address of Colonel Crompton, President of the Mechanical Science Section, was occupied with three main subjects—high-speed railways, traffic in streets, and foreign competition. He considered that in future high-speed railways would be worked by electrical power, and that there would be a great development of such railways over the long distances presented by American travel. In England there were only a few journeys long enough to make saving of time by high speed a very essential element, and the topographical question would put English engineers at a disadvantage, since the number and mileage of such railways would be far greater on the Continent and in America than in England. We do not see the force of the argument; if high-speed railways can be made safe and are not injurious to health (on both which points we have our doubts), people in England will alike demand them in spite of the comparatively short distances. But the question arose, he said, whether rapid transit between two towns might not best be effected by high-speed motor cars running on special roads constructed for the purpose. This is an idea worth consideration, but it is to be hoped separate roads would be provided for going and returning, otherwise, in spite of steering, there would be likely to be some fearful accidents. In regard to street traffic Colonel Crompton laid stress on the difficulties created by the mingling of slow and quick (or what should be quick) traffic, and by the constant neglect of the rule to keep to the left of the roadway except when moving out to pass another vehicle. This is very well on paper, but there is little possibility of adhering to such a rule in crowded streets. "A great deal might be done," he suggested, "by arranging that during certain hours much of the slower moving traffic should be shunted into alternative routes, so as to be kept by itself. Motor cars could safely travel at sixteen miles an hour, and therefore need only take half the time and occupy only half the street surface that an omnibus did when travelling at eight miles per hour. Such high speeds as these, which were desirable and perfectly safe for motor cars, could not, however, be obtained unless some regulations were made as to the use of the roadways by foot passengers;" and it was also suggested that towns situated on our main through roads should provide alternative routes so that through travellers could, if they desired, avoid the crowded streets of the town. But how many through travellers are there in the streets of our large towns? Vehicles coming to a large town have almost invariably that town as their immediate object; the through traffic would not be important enough to justify a special route. On the whole, one can hardly consider the address a very logical one, or adding much to the subject. In regard to foreign competition, Colonel Crompton emphasised the fact, which has been more than once referred to in our columns, that "the chief difference between the manufacturer of America and the manufacturer at home was that, whether it be steam-engines, tools, agricultural machinery, or electrical machinery, the American invariably manufactured goods in large quantities to standard patterns. In America work was far more specialised than here, so that a manufacturer as a rule provided himself with a complete outfit of machinery to turn out large numbers of one article. In America it seemed to be understood by the purchaser that it was a distinct advantage to every one concerned, both manufacturer and purchaser, that the purchaser should to some extent give way and modify his requirements so as to conform with the standard patterns. On other matters it was quite possible for manufacturers here to combine, so as to obtain some standardisation of parts. Many years ago Sir Joseph Whitworth impressed on the world the importance in mechanical engineering of extreme accuracy, and of securing the accurate fit and interchangeability of parts by standard gauges. But in spite of his idea being so widely known and

* The direct quotations are from the *Times* report, except the paper on lightning conductors by Mr. Killingworth Hedges, which is from a report specially furnished to us.

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taught, how seldom had it been acted upon to the extent that it should be!"

It is this practice of manufacturing standard and interchangeable parts that enabled an American firm, not long since, to supply a Government order which English firms declared themselves unable to cope with in the allotted time. Such a system is not, of course, so satisfactory to an engineer, who likes to design structural details after his own mind; but it is a very important factor in the race against time, which is becoming so pressing an element in modern work.

At a subsequent meeting of the Mechanical Science Section Mr. Hele-Shaw read a paper on "Resistance of Road Vehicles to Traction," a subject which he has made his own, and on which he has been carrying out a series of special experiments. Mr. Norman Macdonald, of Edinburgh, read an important paper on railway rolling stock. He summed up, on the question of locomotives, in favour of the compound as against the simple engine, and expressed his surprise (as he well might) at the fact that only one railway in England regularly used compound engines. We suspect the fact is that one great railway company will not, out of jealousy or a fear to appear to be learning from its rival, adopt a principle which has been started by the locomotive designer of another great railway. Instead of that, they endeavour to show that it is all a mistake, and that the supposed advantage of the compound engine is imaginary; a conclusion with which facts and statistics are at variance. Mr. Macdonald next emphasised the importance of the boiler, and even recommended moderate-sized driving wheels in order to get in a larger boiler; a question, we take it, between speed and "staying power" in the engine. We were behind other nations in our locomotive boiler pressures, which showed an average of 180 lbs. pressure with occasional excursions to 200 lbs.; while in the United States pressures of 210 lbs. to 215 lbs. were the ordinary ones, and the best engines ran to 225 lbs. and 230 lbs., and it was expected that before long 250 lbs. and even higher pressures would become common. He also pointed out that at the Paris Exhibition the British locomotives were almost the only ones which did not show some form of equalising or compensating levers for the purpose of automatically distributing shocks over the various springs and axles. Mr. Macdonald seemed to suggest that our system of carrying rails in chairs tended to multiply shocks, and therefore the more required such precaution against their effects. He does not appear however to have stated what system of rail-laying be recommended as free from the supposed defects of our own. At the same meeting Lord Rosse read a paper on the rather novel subject "An Arrester for Intercepting Leaves in the Intake of a Water Supply:"—

"The apparatus consisted of a cylinder of wire gauze, 4 ft. in diameter and 4 ft. 6 in. in height, set in an opening in a vertical diaphragm extending across the supply drain and revolving twice in a minute or so round a vertical axis. The current flowed through the gauze cylinder in a horizontal direction. The leaves carried down with the current adhered to the cylinder under pressure of the stream, and were carried round till they reached the diaphragm. The latter on one side was double, with an intervening space of some 10 in., which was connected with the tail-race. When the cylinder had made a sufficient part of a revolution for the current, relatively to the gauze, to be reversed, the leaves were detached and carried by a portion of the water towards the tail-race. Four or five per cent. of the supply was ample for conveying the leaves: probably much less would suffice. A very few leaves got past and on to the screen, but so few that they gave no trouble."

At the meeting of the same section on the 17th it was stated that it had been usual to devote the Monday to electrical engineering papers, but that on this occasion none were forthcoming; an exceedingly surprising announcement considering the exceptionally active position of electrical engineering at the present moment. As the nearest approach to an electrical subject, Mr. Killingworth Hedges read a paper on "The Protection of Buildings from Lightning," of which we are able to give the following *résumé*:—

"The last time this subject was brought before this Association was at the Bath meeting in 1888, when a joint discussion of Sections A and G was held; but there has been no official report as to the effect of lightning stroke upon buildings protected by conductors since the Lightning Rod Conference of 1882. Interest in the subject has been again revived, first, by the Electro-Technische Verein of Berlin, who have this year published a set of rules; and, secondly, by the establishment in this country of the Lightning Research Committee, organised jointly by the Royal Institute of British Architects and the Surveyors' Institution.

The author compares Continental and American practice, and gives an account of his rearrangement of the system used at St. Paul's Cathedral, where the conductors, erected as recently as 1872, were found to be totally inefficient, both as regards the conductivity of the joints and the resistance of the earth connexions. In the plan recommended, both for this installation and for the more recent one at Westminster Abbey, the number of ordinary conductors from air to earth has been greatly increased, and, besides these, horizontal cables are run on the ridges of the roofs and in other prominent positions so as to encircle the building, being interconnected to the vertical conductors wherever they cross one another. The horizontal cables are furnished at intervals with aigrettes, or spikes, which are invisible from the ground level, and are designed to give many points of discharge. At the same time they, in conjunction with the cables, would receive any side flash which might occur should any portion of the building receive a direct stroke of lightning.

The unreliability of soldered joints for conductors, whether of cable or tape, has led the author to design a special joint box, which can be applied for uniting any portion of the system together in such a manner as to give great mechanical strength as well as good electrical contact; at the same time any box can have points inserted so as to form an aigrette in any desired position.

Owing to the difficulty of sinking an earth plate of sufficient area, on account of old foundations, a special form of tubular earth has been designed which takes up little space and has the advantage that if a suitable moist ground is not obtainable the desired low electrical resistance is attained by leading a tube in connexion with the rain-water pipes, so that a portion of the rainfall is diverted to the tubular earth.

The author alludes to the immense amount of damage to property annually occurring which might be prevented if efficient conductors were installed. He mentions that instead of every church having its lightning conductor not ten per cent. are so provided; and in the case of other public buildings the percentage is not much larger, the reason in the case of the former class of buildings being that a vicar wishing to safeguard his church has usually to pay the cost out of his own pocket.

Architects, as a rule, treat the question of lightning conductors in a very brief manner, and in their specifications seldom say anything as to the way in which they are to be run, or the necessity for good joints and good earth connexions."

We may have space for some further notes next week on some of the subjects discussed in other sections.

HYDE ABBEY AND KING ALFRED'S MILLENARY.

THE Millenary of King Alfred is an all-absorbing topic of the week. The City of Winchester, already interesting to the eye, is proving itself interesting to the mind as well, and the Cathedral, the West Gate, the City Cross, and other architectural treasures of the place are, for once, out-vied by the humbler scanty remains of Hyde Abbey and the Tudor-arched gateway in King Alfred-place, just beyond the north walls.

Appropriately enough, on the first day of the four devoted to the local festivities in honour of the great king, the Mayor's guests went in worldly pilgrimage to the shrine of their saint, Hyde Abbey, the site of King Alfred's interment, where, a month or two ago, some portions of the foundations of the apse of the abbey church were unearthed.

This church was the one to which the monks removed in 1110 from New Minster, which was so close to the Cathedral, or Old Minster—and to the abbey founded by Alfred's Queen hard by, as to interfere with each other's services by bell-ringing, &c. The properties of the Abbey of New Minster were regranted to Hyde with some further additions of land and privileges.

New Minster was dedicated in 903 to the Blessed Trinity, Our Lady, and St. Peter by King Edward the Elder, son of Alfred, and consecrated by Archbishop Plegmund. Edward transferred the remains of his father and mother to the new church on its completion, and placed secular Canons in the Abbey. After a tenancy of sixty years or so, the disorders within the monastery were stopped by the Ecclesiastical and Civil Authorities combined, and the Canons who would not take the monk's habit were dismissed and monks brought from Abingdon to replace them. For about a century little is chronicled about the Abbey, but Alwy, brother of Earl Godwin, who succeeded to the Abbacy in the latter half of Edward the Confessor's reign, took part with Harold, his nephew, with twelve monks and twenty soldiers against the Conqueror, and was killed. William I. then seized the Abbey Estates, and kept the Abbacy for two years before allowing an Abbot to be chosen, and alienated their narrow enclosure.

Relenting after two years, the King elected Wulfric, and gave back part of the Abbey and other possessions in exchange for some he still kept.

During the whole of Rufus' reign New Minster was in the hands of Passflebere, the king's agent. A temporary end of the monks' troubles came at the accession of Henry I., when a regular abbot was chosen from the cathedral—Hugh, renowned for piety and monastic discipline. It was in this reign the removal to Hyde took place. Hyde Abbey had been erected for the monks by Giffard, Bishop of Winchester, at the instance of the King, and the buildings were on a sumptuous scale. One of the privileges extended to Hyde was enjoyed by the monks when at New Minster, viz., the possession with the monks of the cathedral to St. James's Church above the castle. St. Peter was chosen patron of Hyde, though it was sometimes known as St. Grimbaldus and sometimes as St. Barnabas.

In 1140, *temp.* Stephen and Maud, the Abbey was burnt down, and the Great Cross given to New Minster by Canute robbed of its gold and silver by Henri de Blois, which was melted in the burning Abbey. He is supposed to have been the incendiary. The damage done to the Abbey amounted to 4,862*l.* 13s. 4d. of the money of the time. The monks instituted Canonical process against him, and Bernard, Abbot of Clereval, helped them in their appeal, which was so powerful, that in 1151 the Bishop had to go to Rome to clear himself. He reconsecrated the cross ten years later, after having carefully restored it.

The church and abbey were rebuilt with great magnificence in Henry II.'s reign, and it soon became one of the most distinguished houses of the kingdom, the Abbot being one of the twenty-five summoned to the Upper House. The bell-tower was destroyed by fire in 1445, with its peal of eight bells.

The last Abbot was John Sulcot, who came from Holm, Norfolk. He was instrumental in getting his University (Cambridge) to comply with the King's divorce, and was consequently promoted, April 19, 1539, to Bangor Cathedral, and allowed to hold Hyde *in commendam*. For his "good services" in promptly giving up the Abbey in 1538, and getting twenty-one of his monks to join him, he was further "preferred," in 1539, to Salisbury, which See he governed for eighteen years. He was buried in that Cathedral.

The value of Hyde Abbey at the Dissolution is given as 865*l.* 18s. 0¾d. (Dugdale), and 865*l.* 1s. 6¾d. (Speed); and the site was granted, 37 Henry VIII., to Richard Bethell, who promptly pulled down the buildings. Leland, writing after Wriothesley had held it for a term of years, said it existed no longer. In Camden's time the remains were still fairly extensive.

King Alfred's remains were undisturbed till 1788, when the Corporation of Winchester required a site for a prison, which was erected on part of the space occupied by the Abbey Church, and capitals of columns and other ornaments were dug up all over the city, especially here. The prison was demolished in 1850.

The Registers were important, notably the Liber de Hyda. The seal of the Abbey is nearly perfect.

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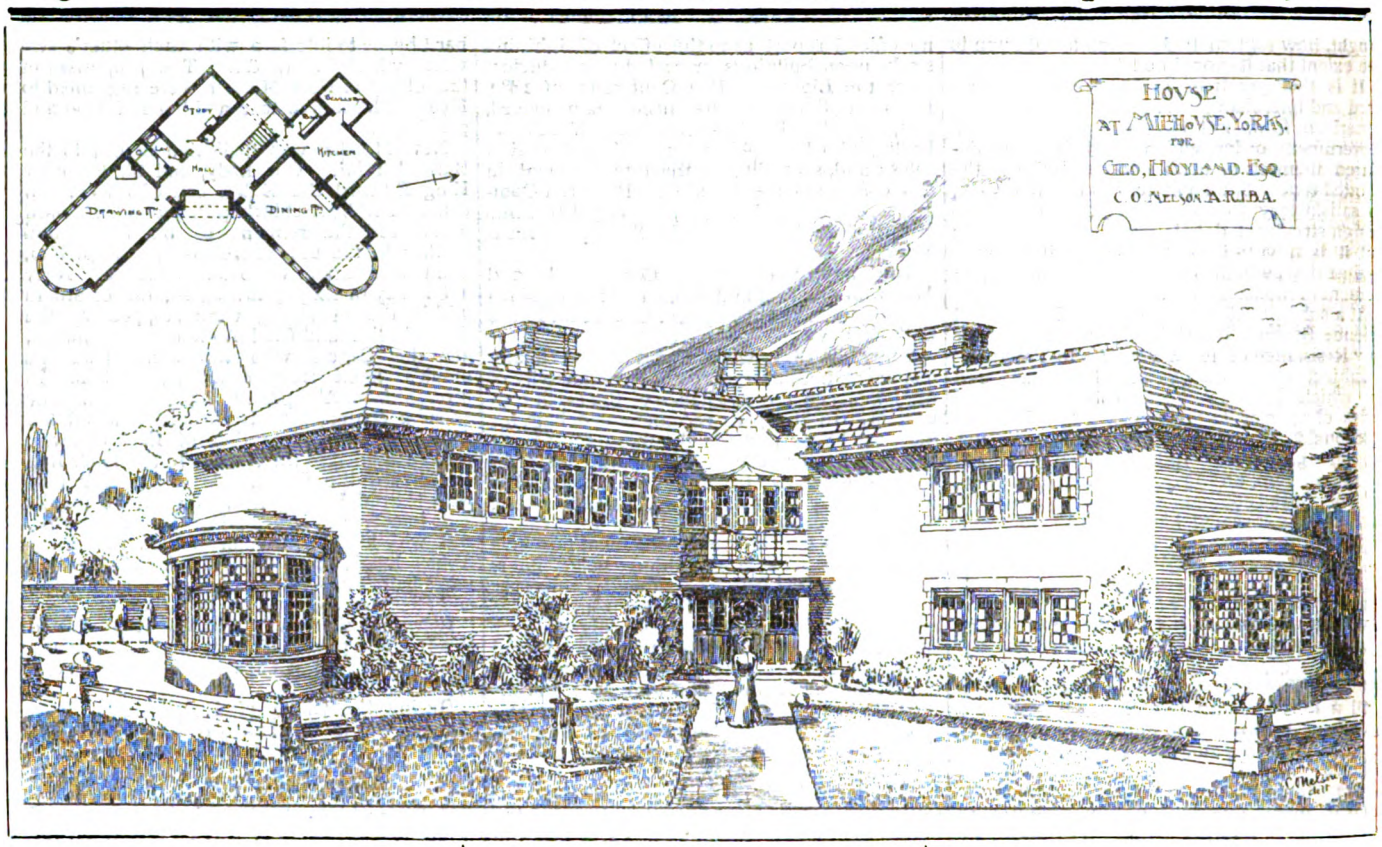

The site is included in the 35 acres of land just recently acquired by the Winchester Corporation as used for a recreation ground, and the gateway is likewise now the property of that city, through the generosity of Mr. Barrow Simonds.

It is impossible, of course, in the above short notice, to more than slightly allude to some of the salient points of interest in the history of Hyde Abbey; but it will serve its purpose if it arouses some public interest in the Abbey of a less local nature. J. A. R.

HOUSE AT MILLHOUSE.

THIS house, to be built for Mr. Geo. Hoyland, will be finely situated for moor views. Local stone will be used, with brick inside stone, slates, and rock stone dressings. Mr. C. O. Nelson, of London, is the architect.

MAGAZINES AND REVIEWS.*

THE *Art Journal* contains the continuation of an essay by Mr. Claude Phillips on the Wallace collection, dealing in this number with the Watteau pictures, and constituting an admirable critical essay on the art of Watteau, so often misunderstood and regarded as frivolous though graceful in its human element. As Mr. Phillips fully recognises and eloquently points out, Watteau's scenes are really full of human passion, but it is passion restrained in expression by the social manners of that outwardly conventional period, when "the modish Cupid of the day" not less effectually "shrilled his tinsel shaft." The exquisite picture entitled "La Fontaine" fully merits, not only in originality and grace of composition, but in real feeling, all that Mr. Phillips says of it. Mr. Montbard continues his effective pen-and-pencil sketches of the capital of Morocco. A notice of Mr. S. J. Hodson's art is given by Mr. Lewis Lusk, under the title "A Painter of Romantic Cities," with various illustrations from his pictures; a subject certainly interesting to us, though we cannot help feeling that Mr. Hodson, whose architectural pictures are very complete and correct, somewhat fails to convey the element suggested by the title of the article, and is accurate rather than romantic. An article on "Scenes of the Chase Applied to Decoration," by Miss Beatrice L. Thompson, deals with a very interesting subject. One point with the author is that sporting subjects were treated as of much more artistic importance by the ancients than by the moderns; as she says, there are plenty of hunting pictures on the walls of our annual exhibitions, but none of them are of any permanent importance in art. She seems rather inclined to dismiss Landseer in the same category; but that would be a mistake. Landseer's stag pictures were not decorative, certainly, because in England in his day no one thought much about decorative art; but they are very fine and powerful works, and will not be forgotten. Fox-hunting certainly has not had its Landseer, or its decorative painter either; but does it, after all, present much attraction for a great painter? And one reason for the prevalence of hunting scenes in antique art is that life was less complex then, and painting dealt with line and movement rather than with emotional expression. It is well, however, that the possibility of doing something more important in art with modern sporting subjects should be suggested.

The *Magazine of Art* devotes an article, written by Mr. B. Kendell, to that fine French painter of idealised figure subjects, M. Raphaël Collin, whose genius and style are judged by the critic both with sympathy and discrimination. M. Collin is not a powerful painter, and can hardly be called a great one; but no painter of the day, perhaps, has been more refined, and has shown more variety, grace, or poetic feeling, in his treatment of the figure as a medium of decorative effect and of ideal suggestion. In the latter respect the two panels in the Opéra Comique illustrating "La Chanson Légère" and "L'Ode," of which small illustrations are given, are very happily characteristic of his way of embodying a poetic ideal in a figure. His larger and much more important picture, "L'Inspiration," which we noticed at the time of its appearance at the Salon, would have been worth a separate plate; the small scale illustration only gives a very inadequate idea of it. We have, however, two large-size reproductions from figure studies by the artist. The remainder of the number is largely occupied with reviews of this year's exhibitions—the Salon, the Academy, and the Guildhall. In reference to landscape at the Academy, is a remark with which we entirely sympathise. The writer (Mr. Spielmann) observes that the British school of landscape, "at least as illustrated at the Royal Academy," has resisted the incursion of the tendency to regard Nature as a mere material for the solution of light and colour problems. The theories of *luministes, pointillistes*, &c., Mr. Spielmann remarks, "are interesting and to be encouraged, but commonly stop short of what ought to be the ultimate aim of a complete work of art. A scrap of landscape, without arrangement or charm of selection or composition, is frequently taken as an excuse for showing how well—perhaps how unprecedentedly well, the painter can suggest blinding sunlight and mysterious shadow. This may be good sunlight painting, but it is not landscape painting:" a caution which is very much needed. There is a short article with some illustrations on "Wood-carving of Mr. J. Phillips," a carver of talent and originality who is to a great extent working with architects in carving ornamental detail. Mr. Phillips appears to be going back to Nature in the endeavour after originality—a course which is tempting but dangerous, when we have to do with architectural carving. In the altar frontal for instance, which forms one of the illustrations, the symmetrical ornament in the panels is very good, but the naturalistic ornament on the uprights is far too ragged, both in itself and in relation to the panels. Every great style of decoration has refused this kind of irregular work; it is a variety no doubt, but it is beside the true end of architectural decoration.

In the *Berlin Architektur-Welt* the leading subject is the "Neues Romanisches Haus," an immense building for shops and dwellings, and including a café, of which Herr F. Schwecten is the architect, but which in its general style might almost be taken to be the work of Richardson. It is, of course, as its name implies, based on the same style on which Richardson founded his architecture; there is, however, a coarseness and showiness about some of the details which we do not find in the American architect's work. It is, however, a powerful and interesting building, the plan of which shows clever treatment of a very irregularly-shaped site. Among the other illustrations in the number are some pretty interiors of dressing-rooms by Carl Müller & Co., a Berlin firm of decorators, which have less than usual of the restlessness of the "Art Nouveau" about them. A double-page illustration of the ceiling of an entertainment-room, painted in a brilliant though somewhat rampant style by Herr Max Koch, is another of the special features of the September issue.

Parts 7 and 8 of vol. viii. of the *Architectural Review* (Boston) contain much interesting matter in both illustrations and text. In Part 7 we have an article with illustrations on "A House of the Transitional Period," which in American architectural history means, apparently, the modern Academical Classic architecture which succeeded the old Colonial period, and preceded the later architectural developments of the United States. The house in question, called "The Old Bennett House," New Bedford, is certainly a remarkable one; a centre block with a pediment and a hexastyle Ionic portico, with detached wings, set back and connected by low buildings to the centre block and decorated with each with a tetrastyle portico on a smaller scale. The writer of the article (Mr. Wheeler Dow) observes—"I should not recommend to a client his exploiting an

* Unavoidably postponed from last week.

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exact replica of the Bennett House, but what a superb suggestion it supplies for modern development!" a sentiment in which we entirely concur. Many of these old symmetrical Classic houses, however unsuitable for precise reproduction as modern dwellings, afford noble types on which to work afresh. It is a pity that a plan of it was not given, for, in the way of modern adaptation, that is of course the root of the matter. The building for the North American Trust Company, at Havana (Messrs. York & Sawyer), is based on a triangular plan with the outer angle rounded off into a nearly half-circle—a very suggestive form of plan of which the most has not been made; the treatment of the rounded portion is weak and wanting in character, and large circular-headed windows on a circular plan are not desirable features. "The Problem of the Store Front," by Mr. R. Coolidge, is an interesting article with a number of illustrations of various executed commercial buildings, none of them however, to our thinking, of very good architectural quality. Mr. Coolidge bestows much praise on Mr. Stephen Codman's latest commercial structure, the Pelham building at Boston, which he calls "the last word in design for a building whose greatest need is light." Steel columns encased in splayed mullions of granite carry the floors, and these mullions of granite-casing run up the greater part of the front in vertical lines, the whole space between them being window and the edges of the floors; but the proportions are far too thin for mullions which appear to the eye to be of granite; moreover, they give the impression of a much smaller scale than the actual one. In Part 8 "Office Lettering," (*i.e.* the writing on plans), by Mr. F. Chouteau Brown, deals with a minor subject which will interest many English architects, who bestow a good deal of thought and consideration on lettering; a matter not unworthy of special attention. Some of the alphabets of capitals are very good, but we hardly sympathise with the rather mechanical system of designing letters which is illustrated, in which the bow-pen takes a larger part than the free hand. The sheets of details of the Massachusetts Horticultural Society's building (Messrs. Wheelwright & Haven) are valuable and interesting; but Messrs. Maginnis, Walsh, & Sullivan's St. Mary's Church, Taunton (Mass.) is a very weak piece of modern quasi-Gothic.

The *Artist* contains an illustrated article on the work of a very remarkable Russian artist, Sascha Schneider, some of whose designs we have seen before, but whose work is little known in this country. Schneider is a very fine draughtsman of the figure (almost always the male figure, not the female), which, however, he uses almost entirely as the symbol of poetically conceived ideas. Some of his conceptions are very striking and original.

Every one interested either in the approaching ceremony of the Coronation or in the preservation of Westminster Abbey from injury or danger to its fabric, should read Mr. Somers Clarke's article in the *Nineteenth Century* on "Westminster Abbey and the Coronation." It is to a great extent historical, and gives some really appalling information as to the way in which the Abbey has been knocked about and misused on former occasions in the course of the erection of vast masses of staging. And, as Mr. Clarke observes, these vast temporary erections actually do away with much of the possible grandeur of the scene. The Abbey itself makes the finest of surroundings for the great ceremonial, and the Abbey has been, to an increasing extent on each successive occasion, despoiled of its beauty in an almost wanton manner. Mr. Clarke has his own suggestions, which he might, however, have explained in more detail. The most prominent feature in them is the proposal for the erection of a great temporary vestibule or hall outside of the west front of the Abbey, which would enable 2,000 persons to see the procession without risk of injury to the building. We do not quite gather what his proposals are for the interior. But we hope his protest against the dangerous and unsightly piling up of mountains of timber scaffolding and seating within the building will receive attention in official quarters.

The *Contemporary Review*, which is generally addicted to grave subjects of a political and moral cast, has launched out into two papers on artistic questions, placed together, evidently as having some connexion in idea. The first is by the able and thoughtful lady who writes under the name of "Vernon Lee," but who in this paper hardly shows her usual intellectual discernment. It is entitled "Art and Usefulness;" and as soon as we see the title we know what to expect. It is the old pet heresy of Ruskin and of other critics of his school dressed up afresh—that art is only craftsmanship; that "furniture and utensils; things which exist because we require them, which we know because we employ them, these are the type of all great works of art." "Vernon Lee" indeed does seem to admit some sort of difficulty in putting craft in the some category as works of imagination:—

"I call *Art* whatever kind of process, intellectual and technical, creates, incidentally or purposely, visible or audible forms, and creates them under the regulation of this æsthetic instinct. Art, therefore, is art whenever any object or any action, or any arrangement, besides being such as to serve a practical purpose or express an emotion or transfer a thought, is such also as to afford the *sui generis* satisfaction which we denote by the adjective: beautiful. But, asks the reader, if every human activity resulting in visible or audible form is to be considered, at least potentially, as art; what becomes of *art* as distinguished from *craft*, or rather what is the difference between what we all mean by art and what we all mean by *craft*?

To this objection, perfectly justified by the facts of our own day, I would answer quite simply: There is no necessary or essential distinction between what we call *art* and what we call *craft*. It is a pure accident, and in all probability a temporary one, which has momentarily separated the two in the last hundred years. Throughout the previous part of the world's history art and craft have been one and the same, at the utmost distinguishable only from a different point of view; *craft* from the practical side, *art* from the contemplative."

So that there is no essential difference, but only an accidental one, between a picture and a wheelbarrow, and things "to serve a practical purpose *or* express an emotion" are things in the same category. "The sonnet or the serenade are useful to the romantic lover in the same manner that carriage-horses and fine clothes are useful to the man who woos more practically-minded ladies." One is loth to speak disrespectfully of such a writer as "Vernon Lee," but we must say that greater nonsense, a more hopeless confusing of things essentially distinct, we never read. And then Vernon Lee endeavours to insinuate that the contemplation of art apart from any end of utility is something frivolous, and that our consciences feel it to be so:—

"If we examine into our own feelings, we shall find that even for the most art-loving of us the hours spent in galleries of pictures and statues, or listening to music at concerts, are largely stolen from our real life of real interests and real pleasures; that there enters into them a great proportion of effort and boredom; at the very best that we do not enjoy (nor expect to enjoy) them at all in the same degree as a dinner in good company, or a walk in bright, bracing weather, let alone, of course, fishing, or hunting, or digging and weeding our little garden" (!)

If that is the way the writer feels in regard to the enjoyment of a fine picture exhibition or a great symphony, we can only say that we are very sorry for her; but she may be assured that there are persons who enjoy these things in a different spirit, and with no feeling of "boredom." All this kind of talk is the result of the modern rage for trying to explain all our pleasure in art, and all the meaning of art; whereas the highest art is not explainable, either in itself or in its influence on us; and as soon as we try to explain we mar it. The succeeding article in the *Contemporary* is by an American lady, Miss (or Mrs.) Ada Cone, and is entitled "The Art Problem in the United States." To some extent we are in sympathy with this article, for it is in part an attack on the American worship of French art, and the idea that America can be made artistic by assimilating the school and the methods of French art. She says, and we think truly—

"The adoption of this course in America is a threatened disaster. For, on the one hand, the characteristics of this art are such that the nation which borrows them necessarily puts a clog on the development of its natural æsthetic expression; and, on the other hand, if we look at the conditions of American life, it appears evident that a people in these conditions which takes European fine art to be a suitable channel for its own expression is a people which has mistaken its way."

This is quite true; we have long regretted, and some thoughtful Americans have regretted, this tendency to make a French art in America, instead of endeavouring to create an American art. But a little further on we find that Ada Cone is attacking French art, and in fact all that is called fine art, in itself, and is in the same condemnation with Vernon Lee:—

"And what is modern fine art? A work divorced from utility as its first condition, and, therefore, separated from the people. A representation of life, of history, of dogma, isolated in a frame, or otherwise detached from its surroundings, an intellectual idea clothed by art laws, in which the intellectual tends to prime the æsthetic, which itself is reduced to a question of processes scarcely appreciated outside the profession except by critics specially trained. This art necessitates an artificial method of instruction. It is learned; however interesting, it is a dead language."

It is perfectly true that fine art demands an intellectual training to understand it; "the people," so far as we take that to mean the mass of the untrained or little trained intellects, do not understand it—and never will, until (if ever that time comes) the present level of education of the best instructed classes is that of the people generally. But to pour contempt on art because it is so intellectual a pleasure that intellectual training is required to enter into it, is about the oddest paradox we have heard of. Some of the author's remarks on French industrial art are, however, true enough, and we may also thank her for a spirited attack on Rodin-worship, and on the collection of curiosities and indecencies which were to be seen in his special pavilion at the 1900 Exhibition.

Under "The Field of Art" in *Scribner's Magazine*, Mr. F. Crowninshield considers the subject of architectural decoration in the form of "a mural painter's letter to his pupils." What he is driving at is not very clear, but apparently he is trying to hold the scales between archæology and invention in decoration; and his conclusion is that "there are plenty of new things to be done on guaranteed lines, plenty of new inspirations to be cajoled from Nature if she be humoured and studied. The expressions of them must be very largely in terms of the past, modified to meet new thought and feeling." That is a reasonable position. We cannot make all art over again, with the idea of being original; but there is much more scope for originality within academic lines than is generally realised, because people are so often content to be academic merely, instead of striving to put a new spirit into the academic framework. As to "Art Nouveau" Mr. Crowninshield speaks out bravely:—

"There never has been, nor ever will be an art nouveau in the sense that its disciples would have us believe, unless there is to be a Man Nouveau. Human taste is essentially the result of aggregated experience, and the old man must be taken into account. There may indeed be novelty, but not necessarily art. Follow the course of art down the perspective of years from its infancy to the present day, and you will never find a 'new art' at any specified moment. It is a gradual evolution. If at times a new art has seemed to burst suddenly into being, it is only because the missing links have been undetected. Archæology has taught us this much, and let us be grateful. The geniuses added their grain of personality to accumulated knowledge, not a great deal, but enough to give interest and the personal note, the *sine qua non* of all great things; but none of them ever dreamed of throwing off the past and starting *ab initio*. Yet this is just what the clamourer for new things would do. They exact too much. They throw off too much. If they knew more, if they retained more, they would give more. Nor do they seem to have any sense of the humorous. To the uninitiated this lack of humour is less obvious in their decorative design where the figure is eliminated. But where there are figures, how ludicrous they often are! Lanky, malarious, grotesque; affected even to absurdity! And their decorative forms are ludicrous, too. On the table before me there lies an amusing reproduction of a restless interior, the latest expression perhaps of Art Nouveau. On its wall a stringy scheme swirls from wainscot to ceiling in fatuous lines. Liberated telegraph wires, snarled and swayed by the storm, seem to be the fundamental motive of another decorative scheme."

This is really refreshing reading.

In the *Century* we have a description and illustrations of a New York institution which we have not before heard of—viz.: "Mid-air dining clubs." This is one use apparently to which the modern high buildings of New York are put, to provide dining-rooms and restaurants high up in mid-air—

"Above the smoke and stir of this dim spot
Which men call earth——"

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dining-clubs reached by swift express "elevators" which in a few moments convey the tired business man from the street to a station in the fresh air and with a wide prospect. A good many illustrations of views from these aërial dining-rooms are given. There is something both seductive and not unpractical in the idea, when you have the high buildings; whether it is worth while to crowd a city with them for this purpose is another question. A short article introduces to us an American landscape-painter, W. L. Picknell, now dead, with whose name and works most English people are probably unacquainted. Like most American painters of any note in recent times, he studied and painted for some years in France, and the one illustration given of his work, "The Road to Concarneau," has (as far as we can judge of it in black and white) the style of the best French school of landscape art.

Harper contains an article by Mr. Arthur Symons on "Prague," with illustrations by Mr. Louis Hitchcock. Mr. Symons's powerful faculty of literary expression enables him to give an effective summary of the historic and picturesque interest of Prague, though there is no special architectural perception displayed in it. The small sketch of the Castle of Karlstein is the most interesting of the illustrations. The same number contains a popular but authoritative article on "Cathode Rays," by Dr. J. J. Thompson.

In the *Pall Mall Magazine* Mr. Hugh B. Philpott has indulged in a speculative or prophetic article on "The London of Ten Years Hence." It is an attempt to describe the impression which will be produced in a walk through London from Westminster to St. Paul's, when the Roman Catholic Cathedral, the new Government Offices and War Office, the Strand improvement and new street, the new courts on the site of Newgate, &c., are all completed. The number also contains an article on Israels and his art, by Professor Liebermann. We learn from it that the great Dutch painter began his career in great poverty and earned a bare existence by portrait painting. He lived at that time in the Jews' quarter at Amsterdam. It was not until the age of forty that he developed the type of execution and of subject which has made him famous; until then he painted, as Professor Liebermann puts it, "like any one else." The general estimate of his genius in the article is just and well expressed. It is worth note that Israels considered himself very deficient in technique; a remark of his is quoted to the effect that "no painter except Millet has been less able to draw and paint than I, and yet made such good pictures." There is, indeed, some similarity between him and Millet intellectually, though not, of course, in style and execution.

Feilden's Magazine contains an account, written by Mr. Lewis Longfield, C.E., of "Argentina," the industrial development of the Argentine Republic, which appears to be progressive by leaps and bounds. Mr. Maxwell's papers on "The Town Refuse Problem" are continued, with sections and illustrations of several types of refuse destructor. He sums up with the conclusion that "from experience gained at steam-raising destructor plants it may be accepted that, in suitably designed stations, town refuse may be relied upon to generate high-pressure steam for the generation of electric energy or other uses, that refuse has a fairly definite calorific and commercial value for this purpose, and that its treatment by fire under the conditions dealt with is not only the most sanitary, but also the most economical and perfect method of disposal of the refuse of towns."

The *Engineering Magazine* is largely occupied with the subject of the installation of exhibitions, having an article on "Engineering at the Glasgow Exhibition," on "Mechanical and Electrical Features of the Pan-American Exhibition" (the Buffalo Exhibition), and on "The Engineering Organisation of a Great Exposition." This last article is a summary of the engineering arrangements of the Paris Exhibition of 1900, and is of considerable interest both as a record, and as a guide and suggestion as to what is necessary in future undertakings on a similar great scale.

A copy of the *Engineering Times*, a journal with which we were not previously acquainted, has been sent to us, containing an article on the "National Industrial Association," the object of which is to federate existing employers' and trade-union organisations, "with the main object of promoting a feeling of common interest between masters and men." It is pointed out that there is at present no association in existence which represents both employers and employed; it is desired to make the Association in question a means of doing this, and of convincing both sides that their interests are identical. That is of course just what is wanted to put an end to strikes and lock-outs; many efforts have been made to that end with only partial and temporary success. If the National Industrial Association can achieve this end it will have done a great work.

In the *Revue Générale* M. Louis Humblet has an interesting critical article under the title "Plume et Pinceau," an attempt to discriminate between the powers of pen and pencil in conveying ideas to the mind. It is a kind of disquisition which perhaps does not lead to very much, for there are so many different points of view from which writing and drawing may be compared; but considerations of this kind at all events serve to stimulate thought in regard to the objects and limits of art.

In the *Cornhill* a very pleasantly written article on "A Byway in the Cotswolds" will put the reader on the trace of a good many interesting old farmhouses and other buildings, which may be missed by the traveller without such hints.

In the *Gentleman's Magazine* Mr. Eric R. Buckley brings together a good deal of curious information in regard to "The Staging of Plays 300 Years Ago."

In *Knowledge* the Rev. J. Bacon's article on "The Capricious Hearing of Certain Sounds at Long Range," evidently based on long and rather special experience and observation, is of interest in regard to the effect of locality on the hearing of fog-signals made by bells or other sound-producers.

Illustrations.

NEW LABORATORIES, NETLEY HOSPITAL.

THE illustration shows a piece of the façade of the new Pathological Institute building, with red brick and Portland stone to match the existing hospital.

We hope to publish the complete plans and general description of the Institute in a future number. The illustration is here given as an example of a very characteristic adaptation of the elements of Classic architecture to a plain piece of building for practical purposes.

The original drawing—which, we may observe, is an exceptionally excellent example of monochrome brush-work—was exhibited at the last Royal Academy.

PARES'S BANK, LEICESTER.

THIS building is now in course of erection for Messrs. Pares's Leicestershire Banking Company as their head offices, and occupies the site of the old buildings.

The new bank is faced externally with Portland stone, the base being of unpolished grey Aberdeen granite. The external sculpture is the work of Mr. Chas. J. Allen, of Liverpool. The banking hall has a domed ceiling of steel construction covered with expanded metal to receive the plastering, the modelled decoration of which has been executed by Mr. G. P. Bankart. The lower portion of the internal walls is lined with unpolished mahogany panelling. The whole of the fittings are polished mahogany. The floors are partly teak and partly marble; the latter work and other marble decorations have been executed by Messrs. Farmer & Brindley. The lead glazing is by Mr. George Wragge. The electroliers and some of the ironwork are the work of the Bromsgrove Guild of Applied Art. Some of the electric standards, name-plates, and other bronze work are by Messrs. Collins & Co., of Leicester.

The contractors for the general building work are Messrs. J. C. Kellett & Son, and the architects Messrs. J. B. Everard & S. Perkins Pick. The total expenditure will amount to nearly 40,000*l*. The drawing was exhibited in this year's Academy.

COTTAGES.

GLAZENWOOD COTTAGE, Guildford, was built for Mr. A. C. Curtis. It is a brick and rough-cast cottage with a slate roof. Mr. Billimore, Guildford, was the builder.

The two gardeners' cottages at Dorking were built for Mr. G. P. Gooch. The walls are 9-in. hollow walls, cement-washed, and white-washed. The roof is of local tiles. The builders are Messrs. Pledge Bros., Dorking.

The proposed gardener's cottage at Lichfield for Mr. F. H. Lloyd, is explained by the plan; the two wings are attached as overflow bachelor quarters from the house, served from the cottage, yet separate from it.

The Artist's Cottage, Bickley, was designed for a site adjacent to a house of similar character, with rough-cast brick walls, red-brick base, red roof, and black paint. It has not been carried out as yet.

Mr. W. Curtis Green and Mr. Arch. C. Dickie are the architects of all the cottages illustrated.

EXAMPLES OF ESSEX BRICKWORK:

FEERING PARISH CHURCH.

THIS is one of many examples to be met with in the county showing brickwork at its best. The county of Essex is peculiarly a brick district, the soil being eminently suitable for the making of bricks, more particularly those of the richest red colour. The bricks are small, not much over 2 in. in thickness, and the joints are wide, owing, no doubt, to the roughness of the hand-process of making; the joints are seldom less than ¾ in. thick, and often more.

The diapering is produced by precisely similar bricks—all headers, but those headers selected which have been fired to a greater extent than the bricks generally. The extra firing produces a rich blue-grey; and with age the tone of the mixed red and blue is delightful.

ARNOLD MITCHELL.

MUNICIPAL ENGINEERS' CONFERENCE AT GLASGOW.

THE sitting of the Municipal Engineers' Section of the Engineering Congress was concluded at Glasgow on Thursday, September 5, Mr. E. G. Mawbey, C.E., Leicester, presiding.

Mr. J. More, jun., C.E., F.R.S.E., read a paper on "Recent Tramway Practice," which called forth considerable discussion.

Mr. A. H. Campbell, Engineer and Surveyor to the East Ham Council, read a paper on the problem of the housing of the labouring classes, with special reference to suburban districts. He said the district of East Ham, growing at the rate of 7,000 persons per annum, and those chiefly of the working classes, afforded probably as good a field as could be found for experience in the problem. The limit of wages which he had in mind in the provision his Council were making was a maximum of 30s. per week. In the provinces, no doubt, this rate would be considerably lower. For the housing of this class the scheme adopted by the East Ham Council was to provide four and five roomed houses, containing 470 superficial feet and 520 superficial feet (available room space) on ground and first floors respectively, at a rental of 5s. 9d. and 6s. 3d. per week (inclusive of all rates, taxes, water, and outgoings). With this idea the scheme was matured, and received official Government approval, providing for the erection of fully 540 separate houses, which, with land charges, formation of roads, and contingencies, made up a total of 120,000*l*. The workman's ideal house should have entrance and exit independent of any other house. To this extent only need it be self-contained, and should have the following accommodation:—(1) A kitchen containing at least 144 superficial feet, net; (2) scullery, with small range, copper, and bath, 90 superficial feet; (3) parlour, usable as a bedroom, 125 superficial feet; and (4) bedroom, 96 superficial feet; total, 435 superficial feet, together with arrangements for coals, water-closet, clothes closets, and larder, all suitably positioned. A house giving the above accommodation should be provided in the London suburbs at an inclusive rental of from 6s. to 6s. 6d. per week, and in the provinces, where building costs, rates, and taxes are lower, at a correspondingly lower rental. It might, no doubt, be desirable to add one or even two bedrooms to the schedule, but the problem before Local Authorities, and given them by the Legislature to carry out, was not the creation of municipal villadoms with their six and seven roomed houses, but the erection of plain, substantial cottages for the respectable lowest-

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wage-earning classes, and at rents within their very restricted means. Hence his plea against the ambitious tendency of municipal bodies to compete in accommodation for show with the houses provided by private persons for quite another and better-off class than was ever intended by the framers of the various schemes. A well-defined municipal policy would bring about a better understanding between Public Authorities and private persons whose capital was embarked in house property. In cases known to him in the suburbs of London there were being provided by Local Authorities houses 8s. 6d., 9s. 6d., 10s., and up to 12s. per week of rental. Schemes like that betrayed ignorance, or at least misconception, of their statutory duty.

The President expressed the fear that in many cases the tenants would take lodgers, and the houses be occupied by two or three families. It was just a question whether it was not more advisable to provide two-roomed tenements at a less cost—say about 1s. 6d. a room per week.

Mr. J. Lobley, Hanley, who moved a vote of thanks to Mr. Campbell, said the problem was largely one for London. There was no doubt in providing this class of dwelling Mr. Campbell was doing something not provided by private enterprise, and he took that to be the point from which this question should be regarded by the Authorities. The difficulty in Midland towns was that the public wanted a 7s. house for a 3s. 6d. rent.

Mr. Cooper, Wimbledon, said the bedroom accommodation in Mr. Campbell's plan was not sufficient for a family.

Mr. Munse, Belfast, asserted that houses could be provided at much less cost in Ireland, and that owners of small house property could make 10 per cent. profit on their outlay.

The vote of thanks was accorded.

Mr. Campbell, in reply, said that they had found the demand was for two-bedroomed houses and not one, however small the bedrooms might be. His Authority would not recognise the taking of one penny from the rates.

Mr. F. W. Mager, Walsall, contributed a paper on "Coal-mining Subsidences in relation to Sewerage Works," which in the absence of the author was taken as read.

The Conference closed with a vote of thanks to Mr. Mawbey for presiding.

COMPETITIONS.

INFANTS SCHOOL, HALIFAX.—In the recent competition for Infant School, Halifax, the 1st premiated design was that sent in by Messrs. C. F. L. Horsfall & Son, Halifax.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The summer meeting of this Institution took place at the Three Towns, Devonshire, last month (August 12 to 17). By permission of the Lords Commissioners of the Admiralty, Devonport Dockyard was first inspected. The workshops were visited and H.M.S. *Queen* (battleship) and *Encounter* (third-class cruiser) were seen in course of building. In the afternoon, by special steamer, the party had a rough passage from Plymouth, outside the breakwater, to view the rivers Yealm and Kitley. On the following morning, a steamer kindly provided by Sir John Jackson took the members from the Promenade Pier to H.M.S. gunnery-ship *Cambridge*, and thence to the torpedo-school ship *Defiance*. In the afternoon, the party visited the Keyham Dockyard Extension Works, a scheme so gigantic that it will involve the expenditure of over four millions sterling. When completed, in about four or five years' time, the port will be provided with ten docks and five basins, including a tidal basin of 35½ acres area—1,550 ft. long, 1,000 ft. wide, and 55 ft. deep, communicating with the Hamoaze by a caisson. The Royal Naval Engineering College was visited first on the morning of the next day, under the guidance of members of the Institution in residence at the college. Proceeding afterwards into the Keyham Steam Yard, the nature of the practical training which the students undergo was pointed out, in the section specially set apart for their instruction. The other divisions of the factory were shown, the Dockyard was visited and a number of various vessels of war therein were seen. In the afternoon some of the members went by brake in very unpropitious weather to Lea Moor to view the China Clay Works belonging to Messrs. Martin Brothers, while others took advantage of an invitation received from the agents to go aboard the famous Atlantic liner *Deutschland* on her call at Plymouth. Under the guidance of the superintendent, Mr. W. A. Moore, the Royal William Victualling Yard was visited on the Thursday morning, special attention being paid to the engineering features. The rebuilding work at the Royal Naval Hospital was afterwards inspected. The afternoon and evening were devoted to a steamer excursion on the river Tamar. Arrived at Cothele, the historic house of the Earl of Mount-Edgecumbe was, by his kindness, opened for the members' inspection. Embarking again, the steamer completed the run to Weir Head and returned down stream to Marwellham. On nearing the Three Towns on the passage back, the powerful searchlights from the vessels in the harbour and from various points on land were observed in operation. The Royal Albert Bridge, Saltash, was visited on Friday morning, Mr. Elms acting as guide on behalf of the Divisional Engineer of the Great Western Railway, Mr. T. H. Gibbons. A thorough examination of the renewal work of the lower girders which was going on was made, and the party ascended into the tube, remaining there during the passage of a train across the bridge, so that they might experience its effect. The degree of vibration of the tube was almost imperceptible, a condition due, it was stated, to the satisfactory character of the girder-strengthening work already referred to. In the afternoon the members were entertained by the Mayor of Plymouth, Mr. J. D. Bellamy, to a garden party in Beaumont Park, the use of which for the purpose had been granted by the Corporation. The magistrates, aldermen, councillors, and other local friends were invited, and all the arrangements made for the pleasure of the guests were much appreciated. The summer dinner of the Institution was held in the evening at the new Hotel Continental, a number of Government officials and other gentlemen of the neighbourhood being invited. An incident of the evening was the presentation of an oak stationery cabinet to Mr. F. S. Pilling in token of the members' gratitude for his assiduous services as honorary local secretary of the meeting, a well-deserved compliment. On Saturday the Plymouth Gas Works were visited under the guidance of the manager, Mr. P. S. Hoyte, and the waterworks at Burrator were also inspected. A number of other engineering works were open during the week to the visit of the members, who were received with the greatest cordiality wherever they went.

Books.

Classic Architecture: A Series of Ten Plates Illustrating Typical Examples of the Grecian and Roman Orders. By CHARLES F. MITCHELL and GEO. A. MITCHELL. London: B. T. Batsford. 1901.

THESE plates have been drawn by the authors, who are lecturers on architecture to the Polytechnic School of Architecture, for the use of students preparing for the examinations of the Board of Education, or intending to become students of the Royal Academy and of the Institute of Architects.

Only one typical example is given of each order, which perhaps is sufficient for the purposes of a student; and though the plates are neither so numerous nor so refined in execution as in Normand or Mauch, they are on a larger page, and give the whole columnar height in each order, instead of giving only the capital and base of the column, according to the older received and orthodox method. The student thus gets his eye inured to the proportional appearance of the whole order. Two plates of Greek and Roman ornament are added. The book is a very good publication for its purpose, though we had thought that Mr. Spiers's selection of plates of the Orders had supplied what was wanted for those who could not possess themselves of the larger collections of Normand or Mauch. As that, however, was issued (if we remember right) by the same publisher, we presume he believes there is room for the new publication without injuring the old one.

Euclid's Elements of Geometry. Books I-IV., VI., and XI. Edited for the Use of Schools. By CHARLES SMITH, M.A., and SOPHIE BRYANT, D.Sc. London: Macmillan & Co., Limited. 1901.

"EUCLID" has been a source of worry to schoolboys for more reasons than one during past generations. Teachers of a former day were prone to require their pupils to repeat word for word the demonstrations as expressed in some standard translation of Euclid's Elements. It was, therefore, only natural that many pupils should come to regard the task as one for the memory rather than for the reasoning powers. The teacher apparently found it easier to criticise parrot-like repetition with the convenient aid of a text-book than to encourage thought, and he seldom or never put before his students new theorems for proof, or problems for solution, in their own language. No wonder then that the elements of geometry were thought by the average schoolboy to be dry and useless. In the work now before us we are pleased to find that the language of Simson, Pott, and Todhunter, is by no means scrupulously followed. Moreover, Euclid's own proofs are discarded in cases where they are incomplete or obscure. Instances of such treatment will be found in I. 22 and 24, II. 9 and 10, and III. 26-29. With regard to the four last-mentioned propositions, relating to the properties of circles, it may be said that proof is afforded by superposition, a method which is instructive and has the advantage that each proposition can be proved independently of the others. Again, Euclid's own proofs are given in certain cases, instead of alternatives as suggested by some editors, because the former are justly considered to be easier of comprehension. The definitions and axioms are clearly explained where necessary by interlineated remarks, some useful notes and exercises are printed at the end of each book, and symbols for words are adopted in the text as far as possible in order to facilitate appreciation of the different steps of reasoning. This edition of Euclid's Elements will undoubtedly be of much help to the beginner, and should do something to popularise what is really an interesting as well as a useful science.

By-Laws as to House Drainage and Sanitary Fittings made by the London County Council. Annotated by GERARD J. G. JENSEN and Another. London: The Sanitary Publishing Company. 1901.

THE new "Drainage By-Laws" of the London County Council did not receive the approval of the Local Government Board until June 14, and Mr. Jensen's preface is dated July. No time, therefore, has been lost in issuing this book. Three sets of by-laws are considered:—(1). By-laws prepared under the Public Health (London) Act, 1891, Section 16 (2), relating to the removal and carriage of fæcal or noxious matter, the closing of cesspools, &c. (2). By-laws prepared under Section 39 (1) of the same Act, with respect to water-closets, earth-closets, privies, ashpits, cesspools, and receptacles for dung; and (3). The new "Drainage By-laws," prepared under the Metropolis Management Act, 1855, Section 202, for regulating "the pipes, drains, and other means of communicating with sewers, and the traps and apparatus connected therewith."

The method of procedure adopted by the authors is to append notes to each by-law. In many cases the notes are simply a re-statement, in different words, of the provisions of the by-law. In others, however, they are explanatory and describe various ways of complying with the by-law, illustrations being added for the purpose of further elucidation. We cannot endorse all the interpretations which the authors have given. Thus, the new drainage by-laws state that every drain (other than a subsoil drain) must be so "constructed as to be water-tight and to be capable of resisting a pressure of at least 2 ft. head of water." With reference to this the authors write—"As, owing to the wording of the clause, it would appear at first sight that the by-law requires drains to be tested by water, it may be well to point out that the pressure to be withstood, and not the means by which drains are to be tested, is prescribed; hence, not only the hydraulic but also the pneumatic test may be employed." There can be little doubt that the intention of the authors of the

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by-law was to make the water test the *official* method of testing, otherwise they would surely have stated the test-pressure in pounds per square inch, and not as "head of water," and would have stated clearly that the drains *must* be tested by the person who laid them. Perhaps, however, Mr. Jensen's mysterious collaborator, whose name, we are told, "it has been necessary to omit from publication for the present," possesses a knowledge of the intentions of the Council which is denied to the outside architect and builder. Objections might also be raised to some of the author's recommendations, as, for example, the wash-down closet in fig. 7, with the outlet joint at the floor level; but taken as a whole, the notes are distinctly useful, and architects and builders will find it a great convenience to have the three sets of by-laws in one handy volume. A map of the administrative county of London, showing the Metropolitan boroughs, is given as a frontispiece, but as very few streets are shown, the map is of little use in fixing the various boundaries.

List of the Streets and Places in the Administrative County of London. Compiled by the Superintending Architect of the L.C.C. London: P. S. King & Son.

THIS is a tolerably large quarto volume giving in tabular form a complete list of the street names within the county of London, the names which formerly existed and have been abolished being given in italics. The list is, of course, alphabetically arranged, and the pages are ruled for columns as follows: "Name—Locality—Postal District—Parish—City or Metropolitan Borough—County Electoral and Parliamentary Division—Ordnance map sheet (5 in. to a mile)—Year of approval—Date of order—Number of plan—Names abolished—Remarks." It will readily be seen for how many purposes such a list as this will be useful.

Mr. G. L. Gomme, the Clerk to the London County Council, writes a short preface, pointing out the historical interest in many cases of old street names, and implying (as we should have expected) that the London County Council is anxious to avoid altering or tampering with these whenever it can be avoided. Some of our London street names go back many centuries for their origin, and are the last existing witnesses to events or circumstances long forgotten, or at least only known to close students of antiquity. In regard to the new names, Mr. Gomme's remarks indicate that these are being treated in a commendable spirit. A new name, as he observes, should not be a duplication of an existing name; it should in some way indicate associations with the place; it should not suggest false history or false associations. We entirely agree also in the feeling that there is a great deal of interest in names carefully chosen, as compared with what Mr. Gomme rightly calls "the soul-less American custom" of numbering the streets instead of naming them. One is pleased to find that the London County Council interfered to preserve the name of "Ducksfoot Lane," in the City, which it was proposed to incorporate as part of Laurence Pountney Hill. We should have been as sorry to lose "Ducksfoot-Lane" in London as "Naughty Boys' Street" ("Rue des Mauvais Garçons") in Paris.

A very fertile source of interesting names for new streets is to be found in calling them by the names of distinguished men; a method which has been much more constantly pursued in Paris than in London; in fact, in France to have a street of the capital named after you is now almost an honour calculated on by any one who has done anything remarkable. One objection may be that in most cases it only represents general and not local associations. Still it is a source of street-naming which deserves more attention than it has received in London.

Canadian Trade Index. Toronto: Canadian Manufacturers' Association. 1901.

THIS is the title of a publication which has been prepared by the Secretary of the Canadian Manufacturers' Association, Toronto, for the use of British, French, and Spanish importers. The "Index" contains the names of some 800 leading manufacturers of Canada, who have formed themselves into a voluntary association for the purpose of advancing the trading interests of the country. It also contains a brief sketch of the leading export manufactures of Canada. Then follows an alphabetical list of the members of the Association, together with a limited list of the articles made by them. The third part contains an alphabetical list of the articles produced by the various members, under which appear the names of the manufacturers of each. The names of the articles are given in English, French, and Spanish.

Superficial Ready Reckoner for Boards, Deals, Battens, &c. By ROBERT HALL, Builders' Surveyor. London: E. & F. N. Spon. 1s.

THIS is a series of tables of the superficial contents in feet, inches, and parts, of Boards, Deals, Battens, &c., from 1 to 50 ft. in length and from ½ in. to 3 ft. in width. There is nothing but the tables, which it is stated have been carefully compiled, and are presumably correct. They are likely to be very useful to those who are concerned in dealing in wood on a basis of superficial measurement.

BOOKS RECEIVED.

SEWAGE AND THE BACTERIAL PURIFICATION OF SEWAGE. By Samuel Rideal, D.Sc. Second Edition. (London: The Sanitary Publishing Company, Limited.)

LIST OF STREETS AND PLACES IN THE COUNTY OF LONDON. Compiled by the Superintending Architect of the L.C.C. (P. S. King & Son.)

PRACTICAL MATHEMATICS FOR BEGINNERS. By Frank Castle, M.I.M.E. (Macmillan & Co.)

CANADIAN TRADE INDEX. (Canadian Manufacturers' Association, Toronto.)

HALL'S SUPERFICIAL READY RECKONER FOR BOARDS, DEALS, BATTENS, &c. By Robert Hall. (E. & F. N. Spon. 1s.)

EARLY RENAISSANCE ARCHITECTURE IN ENGLAND. By J. Alfred Gotch, F.S.A. (B. T. Batsford.)

The Student's Column.

GAS AND GAS FITTINGS.

12.—INCANDESCENT GAS LIGHTING.

ENERGY LOST IN GENERATING LIGHT.—In all artificial methods of generating light, other than phosphorescent light, more energy is expended in producing heat than in producing light. The large proportion of energy so wasted is indicated in the following table given by Professor Lewes in the Cantor Lectures in 1896:—

Percentage of energy transformed into:	Heat.	Light.
Candles	98	2
Oil lamps	98	2
Coal-gas:—		
Flat flame and argand	98	2
Regenerative	93	6
Incandescent	88	12
Electric light:—		
Geissler tubes	97	3
Arc	90	10
Incandescent	95	5
Magnesium light	85	15
Sunlight	70	30
Glow worms, fireflies, and luminous beetles	1	99

Welsbach System of Lighting.—The foregoing table shows that a marked advance over all the earlier methods of generating light from gas has been made by the discovery of the Welsbach system of lighting. This system consists in heating to brilliant incandescence certain substances in a finely divided condition by means of a non-luminous gas flame. The luminosity of an ordinary luminous flame is due to the presence within it of solid carbon particles heated to incandescence; hence the luminous flame is an incandescent gas-light. The phrase "incandescent gas-light" is, however, usually applied only to light produced by heating by means of a non-luminous gas flame a body which when so heated emits light without simultaneously undergoing permanent chemical change.

The non-luminous flame may be produced by mixing air before the point of ignition with gas containing illuminating hydrocarbons, such as coal-gas; or may be produced by gas free from illuminating hydrocarbons, such as water-gas, which burns in the atmosphere with a non-luminous flame, and which consequently does not require admixture with air before ignition at the burner.

Early Forms of Incandescent Light.—The earliest form of incandescent gaslight was that known as the "limelight" introduced by Drummond in 1826, the lime being heated to incandescence by the intensely hot oxyhydrogen blowpipe flame. In later years cylinders of magnesia and of zirconia were substituted for the lime, but large masses of material, such as are used for limelight purposes, cannot be economically heated to the temperature required to render them incandescent.

After Drummond's discovery attempts were made from time to time to use lime and other earthy oxides in more attenuated form for generating light, and metallic mantles of platinum, or platinum alloyed with other metals, were repeatedly tried, but never proved a commercial success.

Welsbach Patents.—The practical success of the incandescent gas-lighting system is due to Dr. Auer von Welsbach, who, after prolonged investigation, at length succeeded in manufacturing a mantle of commercial value.

In 1885 Welsbach obtained a patent for making mantles by saturating cotton fabric with certain metallic salts, the cotton being subsequently ignited and a skeleton of metallic oxides retaining the meshwork form of the cotton fabric produced. After ignition of the cotton the mantle is exceedingly fragile, and it was of little commercial value until (in 1887) a process was found which enabled the mantles to be handled and transported without damage. This process consisted in dipping the mantle into a solution of collodion, and then allowing the mantle to become dry. The collodion formed an elastic varnish over the mantle which protected it during transport, and which could readily be burnt off the mantle when the latter had been placed in the position in which it was to be used.

In 1886, Welsbach obtained another patent in which he claimed the use of thoria, used alone or mixed with other earthy oxides.

The mantles sold prior to the year 1891 gave a light of about six candles per cubic foot of gas consumed per hour, and it was believed that this light was emitted by pure thoria. About the year 1891, however, it was discovered that a mantle of pure thoria emitted very little light, but that a mantle consisting of 99 per cent. thoria and 1 per cent. ceria gave the remarkably high efficiency of about 17 candles per cubic foot of gas consumed per hour.

The efficiency of the early thoria mantles is now known to have been due to the presence of a very small proportion of ceria, which existed as an impurity in the commercial thoria used in manufacturing the mantles, and in 1893 Mr. Moeller, of the Welsbach Company, obtained a patent for a mantle consisting of thoria mixed with ceria or certain other rare earthy oxides, in quantities not exceeding 1 or 2 per cent.

Excitants.—A great number of substances have been used for the manufacture of mantles, but it is now recognised that an efficient mantle cannot be made of any pure oxide, and that a small proportion of some other oxide, sometimes termed an "excitant," must also be present. Nearly all the mantles at present in use consist of 99 per cent. of thoria with about 1 per cent. of ceria to act as an excitant.

Theory of Luminosity.—A mantle consisting of about 1 per cent. ceria and 99 per cent. thoria yields the greatest amount of light on an incandescent burner. If the proportion of ceria be materially increased or decreased the light-emitting power of the mantle becomes greatly diminished. Mantles of pure thoria or of pure ceria emit very little light. The nature of the action of the ceria upon the thoria is unknown. Many ingenious theories have been advanced to account for it, but none are entirely satisfactory. Mr. Swinton has proved that the generation of light does not occur if the mantle be heated in a vacuum tube, and it may therefore be assumed that one of the constituents of the atmosphere, probably the oxygen, exerts an important influence upon one or both constituents of the mantle when the thoria and ceria are mixed or combined in the required proportions. Dr. Bunte has suggested that the generation of light is due to intense local temperature produced on the surface of the mantle by combination of the hydrogen of the gas with atmospheric oxygen, brought about by the catalytic action of the ceria. He found by experiment that in the absence of ceria, chemical combination between hydrogen and oxygen, mixed in the proportion of 2 to 1, did not occur below a temperature of 1,200 deg. Fahr., whereas in the presence of ceria the combination took place at a temperature of 600 deg. Fahr. Thoria was found to have no

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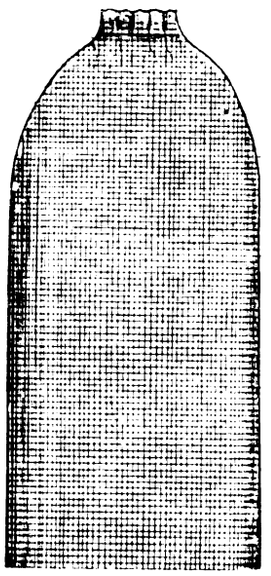
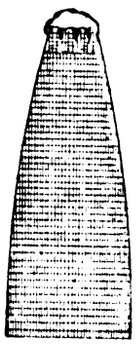


(*a*) Cotton Hood for Incandescent Mantle Manufacture.



(*b*) Mantle Produced after Burning off the Cotton.

Fig. 26.

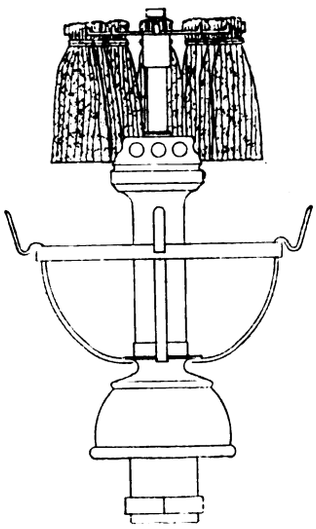


Fig. 27.—De Lery Burner and Tassels.

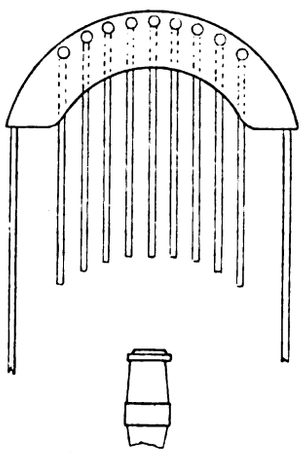


Fig. 28.—Fahnehjelm Comb for Incandescent-Lighting.

influence upon the temperature of which chemical action occurred.

So far as is known, ceria will not act so efficiently as an excitant upon any material other than thoria, and although other materials may be used as excitants for thoria, none are so efficient as ceria.

Many cases are known in which two dissimilar substances will not enter into chemical combination unless a third body be present, which, however, itself undergoes no permament chemical change, and the influence exerted by this third body is spoken of as "catalytic action." The cause of catalytic action is not yet known, and the use of the term by modern chemists is akin to the fatuous explanation of the action of the common pump given by ancient philosophers when they said that "Nature abhors a vacuum."

Pink "Sunlight" Mantles.—Other oxides than those of thorium and cerium have the power, when mixed in certain combinations, of emitting light when used in the form of mantles for gas flames. The pink "Sunlight" mantle, which emits a golden-yellow light, consists of the oxides of aluminium and chromium; zirconia may also be added, but merely acts as a neutral constituent without affecting the lighting efficiency of the mantle. Mantles of pure alumina or of pure chromic oxide have little or no light-emitting power, but when the two oxides are combined in certain proportions the mantle of mixed oxides gives a light efficiency of about eleven candles per cubic foot of gas consumed per hour. The chromium, however, appears to gradually volatilise under the high temperature of the flame, and in the course of a few weeks the light emitted by the mantle diminishes materially.

Manufacture of Mantles.—To manufacture a mantle for incandescent gas lighting, a network hood (fig. 26*a*) of cotton or other vegetable fibre is soaked in a strong solution of the nitrates of thoria and ceria mixed in the correct proportions. The mantle is then passed through a small wringer, dried, stretched into suitable shape on a wooden or glass mould, and then, with the aid of a gas flame, the cotton is ignited. The hood while burning shrinks considerably (fig. 26*b*), and a fragile mantle of oxides in the desired shape is obtained; the conversion of the nitrates into oxides is usually completed by heating the mantle over a blast flame, which also has the effect of strengthening the mantle. Finally, the mantle is trimmed into shape and "collodionised."

The object of dipping the mantle into a solution of collodion, or some substance of a similar flexible nature, is to render it less liable to breakage when handled and during transport; and as soon as the mantle is placed upon the burner and a flame applied to it, the collodion burns away and leaves the fragile network of oxides.

Collodion Mantles.—Instead of making mantles by soaking cotton fabrics in solutions of the salts, they are now extensively manufactured by mixing the salts into a paste with collodion solution, then squeezing the paste into threads through capillary tubes under pressure, and finally weaving the dried thread into a network hood similar in shape to that made from cotton fabric.

When the collodion is burnt off, the network of oxides forming the mantle may be distinguished from the mantle made by the use of a cotton hood by examination under the microscope. The threads from the collodion mantles appear like loose bundles of rods, while the threads from mantles made with cotton, after the cotton has been burnt off, have a fluted and more compact appearance.

Shape of Incandescent Mantle.—In this country mantles of the Welsbach shape are at present universally used, but in America the De Lery tassels arranged in a circle around a rose burner (fig. 27) are being extensively used. These tassels are, we believe, similar in composition to the Welsbach mantles, although they do not give so great an illuminating power per unit of gas consumed, but their effect is more pleasing to the eye, owing to the absence of the irritating glare common to mantles of the Welsbach shape.

Attempts have also been made to adapt incandescing bodies to non-luminous flat flames. Fahnehjelm, of Stockholm, introduced (in 1885) a comb consisting of a number of thin magnesia rods, set in a fireclay back, having an iron frame. This comb (fig. 28) was suspended over the non-luminous flame. If water-gas were used the gas was consumed in a small Bray burner, but the comb was never very successful, owing to the volatility of the magnesia.

The "fringe" or "plume" subsequently invented by De Mare was a somewhat similar device, but was more successful, owing to its being composed of non-volatile rare earths having a greater light emissivity. The use of these rare earths, however, was in this country held to be an infringement of a Welsbach patent.

Value of Different Gases for Incandescent Lighting.—It is often stated that the value of gas for incandescent lighting is directly proportionate to its calorific power, and Mr. Foulis has published the following figures, which appear to support that statement, since the calorific value of plain coal-gas increases with the illuminating power:—

Illuminating Power. Flat flame, corrected to 5 cubic feet per hour. Candles.		Illuminating Power. Incandescent burner, corrected to 5 cubic feet per hour. Candles.
23·1	.....	117·3
17·9	.....	90·3
16·2	.....	87·9
14·6	.....	84·4
13·5	.....	81·9

Dr. Bunte and Dr. Strache have, on the other hand, shown that as high an efficiency for incandescent lighting may be obtained from gases of much lower calorific value, as from coal-gas. Dr. Bunte experimented with coal-gas alone and then with coal-gas mixed with certain other gases, and found that the addition of 20 per cent. of water-gas to the coal-gas does not diminish its efficiency for incandescent lighting, although it materially reduces its illuminating power for flat-flame lighting, and also its calorific value. The following are some of the results obtained by Dr. Bunte:—

	Slit burner. 5½ cubic feet per hour. Hefner candles.		Welsbach incandescent burner. 3·53 cubic feet per hour. Hefner candles.
Coal-gas	15·0	.....	70·0
Coal-gas, with 20 per cent. water-gas ...	3·1	.....	73·5
Coal-gas, with 20 per cent. carbon monoxide.....	2·8	.....	59·5
Coal-gas, with 20 per cent. hydrogen ...	7·3	.....	70·0
Coal-gas, with 20 per cent. marsh-gas ...	12·5	.....	61·6
Coal-gas, with 25 per cent. ethylene.....	4·0	.....	95·2
Coal-gas, carburetted with benzol.....	25·0	.....	75·6

The Hefner-Alteneck amyl-acetate lamp is extensively used in Germany as a standard of light, and a Hefner candle is equivalent to 0·877 of an English standard candle.

Dr. Strache has devised a number of incandescent burners for consuming plain water-gas possessing about one-half the calorific value of coal-gas. The water-gas flame being non-luminous, it is not necessary to mix air with the gas before the point of ignition, and Dr. Strache finds that the plain water-gas is quite as efficient for incandescent lighting as coal-gas. In fact, it will be seen from the following figures published by him that he claims a considerably

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higher efficiency for water-gas than for coal-gas :—

Incandescent light.	Consumption per 1,000 candle hours.	Heat developed per 1,000 candle hours.	Oxygen consumed per 1,000 candle hours.
	Cubic feet.	Calories.	Cubic feet.
Water-gas ...	52·4	3,710	24·6
Coal-gas.....	84·5	11,970	103·1

Dr. Strache claims for incandescent lighting with plain water-gas that a very white light of great brilliancy is obtained, and that, compared with incandescent lighting with coal-gas, it has the advantage of emitting less heat per unit of light, that less atmospheric oxygen is consumed and less carbon dioxide produced, and that as air is not mixed with the gas before the point of ignition, the flame can never "flash back." Also that, owing to the absence of hydrocarbons in the gas, the flame never smokes, and carbon is never deposited upon the mantle.

It is evident, therefore, that the value of gas for incandescent lighting as used at the present time is not solely dependent upon its calorific power, but that the flame temperature per unit of area must also be taken into consideration. Water-gas when consumed in an argand burner at the rate of 5 cubic feet per hour gives a flame 1 in. in height, whereas coal-gas consumed at the same rate gives a flame from 2½ in. to 3 in. in height. Hence a given area of water-gas flame may be of a higher temperature than a similar area of coal gas flame, although the total heat of the coal-gas flame per unit of gas consumed is twice as great as that of the water-gas flame.

Possibly a method may presently be discovered of causing the coal-gas to burn with a shorter flame (as it does in high-pressure systems), and a higher value for incandescent lighting be obtained from it.

In a paper read at the recent Engineering Congress at Glasgow Professor Lewes ascribed the high lighting efficiency of water-gas to the fact that it does not require admixture with air before the point of ignition, that the inner cone of flame formed in coal-gas burners is therefore absent, and that consequently there is "little or no difference in the temperature of the outer zones of the flames in which the mantle is heated." It is possible that this may be the correct explanation, but extensive experimental investigation is yet required into the relationship between light and heat in the Welsbach system of lighting.

OBITUARY.

MR. LLOYD.—We regret to announce the death, at Redditch, through misadventure, on the 12th instant, of Mr. Herbert R. Lloyd, of Birmingham and Redditch, architect and surveyor, aged thirty-nine years. Mr. Lloyd was a well-known man, and was highly respected. Of his more recent professional works we may mention the restoration, as completed in August, 1898, of St. Mary's Church, at Cowes, in the Isle of Wight; the new Technical Schools at Redditch, comprising carpenters' and smiths' shops, a lecture theatre, and (in the top room) a museum gallery, which were opened in October of last year; and a church and Sunday school for the United Methodists, at Mount Pleasant, Redditch, opened just twelve months ago. Mr. Lloyd and Mr. Henry T. Hare, as joint architects, prepared the plans and designs for the new Isolation Hospital at Hill Top, Bromsgrove, for the Bromsgrove, Droitwich, and Redditch Joint Boards, in respect of which a contract-tender of 10,080*l.* by Messrs. J. & A. Brazier, of Bromsgrove, was accepted in December last.

GENERAL BUILDING NEWS.

MEMORIAL CHURCH, LLANDUDNO.—On the 4th inst. the Bishop of St. Asaph consecrated St. Paul's Church, better known as the Duke of Clarence Memorial Church, at Craigydon, Llandudno. Sittings are provided for 950 worshippers. The style is Early English, and the building consists of a nave, 94 ft. long by 28 ft. wide, with north and south arcades, and entrances towards the west and south, a chancel 37 ft. long and 25 ft. high, with an aisle or chapel on one side, and vestries and organ chamber on the other. The tower and spire will stand at the south-west angle of the nave. The church is built of local limestone, with dressings of Bromsgrove stone The architect of the church was Mr. Oldrid Scott.

CHURCH, CROOKESMOOR, SHEFFIELD. — The scheme for the formation of the new parochial district of St. Nathaniel, Crookesmoor, is now complete, and the foundation-stone of the parish church will be laid on October 7. The site of the church is in Roebuck-road. When complete the building will seat a congregation of 700; but the funds do not permit the signing of the contract at present for the completion of the church, and consequently the nave is to be built first. Without the chancel, there will be seating accommodation for a congregation of 580. The front of the building will be in Roebuck-road, and there will also be an entrance from Chatwin-street. The plans have been prepared by Mr. Joseph Norton, of Sheffield, and the total cost of building the church will be about 7,000*l.*

RESTORATION OF LLANDENNY CHURCH.—The Bishop of Llandaff recently reopened the restored parish church of Llandenny, near Usk. The diocesan surveyor, Mr. G. E. Halliday, of Cardiff, was the architect of the restoration, and Mr. Ballinger, of Dingestow, was the contractor. The interior facing of the church has practically been entirely renewed, the plaster stripped and the walls pointed, whilst the tower has been largely restored. During the work an ancient window in the north wall was discovered. This had been hidden from view by a mediæval buttress. The architect says the window is one of the very few remaining fragments of British for pre-Norman church architecture preserved in the Principality. The opening is only 3 in. wide, and from the wide inner splay it seems to have been used for defensive purposes. The fragment is in very good preservation. A new pulpit has been erected by the parishioners in memory of Queen Victoria. The old lych gate, one of four early examples remaining in the diocese, has been restored.—*South Wales Daily News.*

CONGREGATIONAL CHURCH, NEW CROSS, LONDON. —Lewisham High-road Congregational Church has been renovated and decorated throughout, and the electric light installed. The stonework of the spire has been repointed in cement and treated with a solution of "Fluate," and a new lightning conductor has been fixed by Messrs. E. Beresford & Co., Ludgate Circus, E.C. The repairs and decoration have been carried out by Messrs. J. O. Collingwood & Co., Brockley, S.E.; the electric light installation by Messrs. Braby and Tomlinson, Hart-street, Bloomsbury. The electric fittings were made by Messrs. Evered & Co., Drury-lane, W.C. The whole have been carried out from the designs and under the superintendence of Messrs. Geo. Baines and Reginald Palmer Baines, architects, Clement's-inn, Strand, W.C., at a total cost of about 1,300*l.*

WESLEYAN CHAPEL, COYTRAHEN, GLAMORGANSHIRE.—The foundation-stones were laid recently of the new chapel which is being erected by the Wesleyans at Coytrahen. The contractor is Mr. Jenkin Mathews, and the architects Messrs. E. W. Burnett & Sons.

CHAPEL, BARRY ISLAND.—A new chapel, erected on a spot adjacent to the post-office on Barry Island, in connexion with the Wesleyan denomination, was opened recently. Mr. D. Morgan was the builder, and Mr. G. A. Birkenhead the architect.

WISHART MEMORIAL CHURCH, DUNDEE.—This building has just been erected in King-street, Dundee. There are two entrances from King-street, each of which leads directly into the nave of the church, while the entrance under the square tower also leads to the gallery and the halls below. The stone dressings of the front elevation are of red Dumfriesshire stone, while the infilling is from Burgmuirhead, Forfarshire. The plan is arranged in one large nave and side aisle and transept, and gallery next King-street. The choir and organ galleries are placed in one end of the transept, while the pulpit and platform are erected on the south wall in an apsidal recess, which is lighted by windows on each side. Traceried windows placed in the nave and transept run up into the roof above the wall head to secure better light. A subsidiary staircase from a side street leads to the vestry and choir gallery, minister's vestry, caretaker's-room, and also the halls in the basement. The tradesmen for the various works have been :—Mason, R. Laing, Dundee; joiner, Thomas C. Stocks, Dundee; plumber, J. Crighton & Sons, Dundee; slater, William Brand & Son, Arbroath; plasterer, Michael Lawless, Dundee; glazier, Lindsay & Scott, Dundee; painter, J. Nicholson, Dundee; blacksmith, William Young, Newport; iron and steel, Nicoll & Son, Dundee; heating engineer, A. L. Peacock & Co., Dundee; stained glass, William Meikle & Son, Glasgow; carving, James Bremner, Dundee. The buildings have been erected from plans by and under the superintendence of Mr. T. Martin Cappon, Dundee.

HOLY TRINITY CHURCH, KENSINGTON.—It is stated that Messrs. Stephens, Bastow, & Co., Limited, of Bristol, have been entrusted with the erection of the new Church of Holy Trinity, Kensington, London, S.W., from designs of Mr. George F. Bodley, A.R.A. The church will cost upwards of 30,000*l.*

CHURCH, WALTON, LANCASHIRE.—The foundation-stone of a new Congregational school church, to be erected in Rice-lane, Walton, was laid on the 14th inst. The structure, when completed, will accommodate 350 people, and will cost 3,500*l.* The architects are Messrs. Brigg & Wolstenholme, and the builder Mr. William Mather.

CHURCH, ROATH, GLAMORGANSHIRE. — A new church for the Roath district of Cardiff was opened on the 14th inst. by the Lord Bishop of Llandaff. It is dedicated to St. Martin, and is situated in Albany-road, off Castle-road. The plans were prepared by Mr. F. R. Kempson, of Cardiff. The plan of the church is a nave of four wide bays flanked by a narrow processional aisle on the north side, and a wide southern aisle. The entire width of the nave with its aisles is 71 ft. There is a porch at the north-west side; the wide south aisle terminates at the west end in a baptistry and internal porch. The chancel consists of two open bays and an enclosed bay forming the sanctuary. It is 43 ft. in length, and of the same width as the nave, from which it is now separated by the base of the future rood-screen. On the north side of the chancel is a chapel 42 ft. in length and 15 ft. wide. On the south side of the chancel lies a passage giving access to the choir vestry and sacristy. Above the sacristy an organ gallery has been built, opening through a stone screen to the south aisle of the nave, and on its north side to the chancel. The building is of red brick with stone facings, the roof being of grey slate. The pulpit and font are of warm red stone.

CHAPEL, EAGLESCLIFFE, YORKSHIRE.—The foundation-stone has just been laid at Eaglescliffe of a new Primitive Methodist chapel and school. The building stands at the junction of Witham-avenue. The chapel will be 50 ft. by 30 ft., and the Sunday-school will occupy a space of 30 ft. by 20 ft. The school will be divided from the chapel by an ornamental glazed partition, which can be set aside when it becomes necessary to provide for a larger congregation. The cost, including the land, will amount to 2,200*l.*, and the chapel will have seating accommodation for 250 people. Messrs. Henry Doughty & Sons, of Yarm, are the builders, and Mr. T. W. T. Richardson, of Stockton, is the architect, under whose supervision the work is being carried out.

BANK, LEEDS.—The stone building which the London City and Midland Bank, Limited, have erected at the junction of North-street and Meanwood-road, Leeds, was opened for business on the 9th inst. Mr. W. Bakewell was the architect.

SMALL-POX HOSPITAL, ELSWICK, LANCASHIRE. —A Board of Trade inquiry has just been held into the application of the Fylde, Preston, and Garstang Joint Small-pox Hospital Committee to the County Council to borrow the sum of 18,000*l.* for the erection at Elswick of a small-pox hospital. Accommodation will be provided for thirty-two patients Mr. Edward C. H. Maidman, of Edinburgh, is the architect. His plans were accepted in open competition.

PROPOSED NEW THEATRE FOR ABERDEEN.—Plans of the proposed new theatre for Robert Arthur's Theatre Co., Ltd, at Rosemount-viaduct, between U. F. South Church and Schoolhill station of Great North of Scotland Railway Co., have just been approved of generally by Aberdeen Town Council. These plans have been prepared by Mr. Frank Matcham, architect, London, and have been lodged by Messrs. Brown and Watt, architects, Aberdeen. The building, in the Italian Renaissance style, will be of light grey granite. The frontage to the viaduct is 115 ft., and the estimated cost is upwards of 20,000*l.*

MUNICIPAL OFFICES FOR LOUGHBOROUGH.—The alterations and additions which have been proceeding for some time at the Town Hall, Loughborough, are nearing completion. The Corn Exchange has been improved and enlarged by a new stage, the old platform having been removed, and dressing-rooms, storerooms, kitchen, and other conveniences provided. The place will accommodate 120 additional persons, the capacity being now 750. Corridors run down each side of the hall, connecting at both front and rear of the exchange, and there are seven exits, all the doors opening outwards. On the right of the entrance hall the old Council-chamber has been renovated, and will henceforth be known as the lecture-hall. With regard more particularly to the offices, a strip of land was purchased from the banking company next door to the Town Hall, and upon this what is termed the north corridor has been built, with access from the one side to the Exchange, and on the other to the office of the Borough Accountant, to a cloakroom and lavatory, a clerks' office, and a committee-room, 36 ft. by 15 ft. Coming to the south corridor, which is that running parallel with Town-hall passage outside, is to be found the Borough Surveyor's department. Rate offices are also located in the same corridor, as well as one for the sanitary inspector. Proceeding towards the end of the corridor there is a staircase leading to the Council Chamber, to the Mayor's parlour, and to a retiring room for members of the Corporation. From this corridor a new fireproof staircase has been made to the Victoria-room, leading likewise to the balcony in the Corn Exchange, and taking the place of an old erection of wood. There is an alcove, or small gallery, in the Council Chamber. The whole of the building work, estimated to cost 6,000*l.*, has been carried out by Messrs. Wm. Moss & Sons, Loughborough; the heating (hot-water apparatus) for the entire place has been entrusted to Messenger & Co., and Messrs. Gascoyne & Son, of Nottingham, did the glazier's work. The plans for the alterations

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and enlargements were prepared by the Borough Surveyor, Mr. A. H. Walker.

ISOLATION HOSPITAL, FORFAR.—An infectious diseases hospital has been built at Whitehills, Forfar, for the Dundee and Forfar Districts of the Forfar County Council. The buildings consist of a large administrative block, on the east side of which is placed the isolation block, having two wards of one bed each, with nurses' room, bathroom, &c., and to the west of the administrative block is the discharge block, with undressing and dressing rooms, bathroom, and stores for patients' clothes. Along the high ground to the south-east of the administrative block is placed the scarlet fever block, having two wards of eight beds each, and two wards of one bed each for acute cases. The nurses' rooms and pantries are placed between the wards; while the baths are placed in annexes at the end of each ward, connected with the main buildings by through ventilated passages. South-west of the administrative block are placed the typhoid and diphtheria blocks, having two wards of two beds each, with nurses' rooms and other conveniences. The offices are placed at the south end of the ground, out of sight of the other wards, and consist of mortuary, ambulance sheds, tool-house, wash-house and ironing-room, disinfector and boiler-house, coal stores, and other conveniences. The blocks have been placed on the highest ridges of the ground, about 60 ft. apart, and the intervening ground made up to an even surface between. Granolithic footpaths lead from the nurses' entrance in the administrative block to all the other blocks. Telephones connect the various wards with the administrative block. The whole ground is enclosed by a stone wall. The contractors for the various works are as follows:—Messrs. James Cargill & Co., builders, Forfar; Messrs. Alexander Hay & Co., joiners, Forfar; Messrs. William Brand & Son, slaters, Arbroath; Mr. D. Brown, plumber, Dundee; Mr. D. Masterton, plasterer, Forfar; Mr. J. H. Douglas, glazier, Montrose; Messrs. Thomas Bradford & Co., laundry engineers, Manchester; Messrs. A. Westwood & Son, bells and telephones, Dundee; gas main, Messrs. William Mitchell & Son, Dundee; water supply, Messrs. William Mitchell & Son, Dundee; drainage, Messrs. J. Gray & Sons, Newtyle; locks and furniture, Messrs. Eadie & Kininmonth, Forfar; painter work, Messrs. Doig & M'Phee, Forfar; boundary walls, Mr. James M'Lean, Forfar; laying out of grounds, Mr. P. Girrity, Dundee; ventilation, Messrs. R Boyle & Sons, Limited, Glasgow; grates, Messrs. G. H. Nicoll & Co., Dundee; gates, Mr. A. M'Call, Dundee; furniture and furnishings, Messrs. Thomas Justice & Sons, Limited, Dundee. The clerk of works being the late Mr. D. Kidd, Mr. Drummond has acted as clerk of works since Mr. Kidd's death. The whole works have been carried out from plans and under the superintendence of the architect, Mr. T. Martin Cappon, Dundee.

PUBLIC OFFICES, SELSTON, NOTTINGHAMSHIRE.—Public offices are being erected at Selston for the Parish Council. The architect is Mr. F. Ball, of Nottingham, and the builders are Messrs. Minkley Bros., of Underwood.

THE NATIONAL PHYSICAL LABORATORY.—Good progress is being made with the works for the enlargement and alteration of the house in Bushey Park for purposes of the new National Physical Laboratory, which it is anticipated will be ready for occupation before the end of the year. The basement and ground floor of the old house will be reserved for physical investigations of a delicate kind. A room measuring 80 ft. by 50 ft., and lighted from the north with a weaving-shed roof, has been constructed for engineering work, with a drawing-office and an engine-house close by. Two general laboratories will be fitted up in the main building, which has a substantially constructed central block, about 70 ft. square on plan, upon a vaulted basement containing several rooms, of which the floor has been thickly overlaid with concrete. The outer and inner walls are very thick, and all the conditions are favourable for the prosecution of steady work in even temperatures. A mercury column is being erected for measuring up to 200 lbs. to the square inch; and for minimising vibration, a 60 kilowatt Parsons' turbine will be employed to distribute electrical power to the various laboratories. A comparator, a dividing-engine, and some high-class measuring apparatus have been presented to the laboratory by Sir Andrew Noble. The first work to be undertaken will be the photo-micrographical examination of steel rails, with the testing of the elastic properties of alloys.

SANITARY AND ENGINEERING NEWS.

STAINES SEWAGE SCHEME.—A Local Government Board Inquiry was held on the 3rd inst. by Mr. F. H. Tulloch, M.Inst.C.E., into an application of the Staines Urban District Council for a loan for the construction of sewage filters, which, on the recommendation of General Carey, past Engineer-in-Chief to the Local Government Board, are to contain Polarite, on the same principle as the Polarite filters at the Chorley Corporation Sewage Works. The filters at Chorley were laid down about seven years ago, and are stated to produce an effluent of so high a degree of purity that the Local Government Board have waived their usual stipulation as to the effluent from them passing over land. At Staines, although the works have been most carefully supervised and ample tank accommodation provided, yet the unsuitable nature of the land has given rise to numerous complaints caused by offensive emanations due to secondary decomposition of the tank effluent when on the land; hence it has been found necessary to resort to artificial filtration through powerfully active oxidising beds. There was no opposition to the scheme, and the chairman, at the conclusion of the inquiry, pointed out to the Inspector the urgent need of the loan, and the expediency of carrying out the improvements forthwith in order to avoid further complaints. We are informed by the International Purification Syndicate of Westminster, the proprietors of Polarite, that by improved arrangements whereby the sewage is distributed on to the beds by means of automatic revolving sprinklers (Candy-Caink patent), labour on the filters is now reduced to practically nothing.

BRADFORD ELECTRICITY EXTENSION.—The memorial stones have just been laid at Bradford of a new generating station in connexion with the electricity supply works. The buildings—which are to be situated in Valley-road, and to face the Midland Railway on ground adjacent to the second generating station erected by the Corporation—were commenced early in the year, and should have been very shortly ready to receive the plant, but owing to the dispute in the building trades the work has been very much delayed, and it will be impossible now to instal the plant and get into working order before the summer of next year. In order, however, to deal with the increased demand for electricity, arrangements have been made to instal two engines of 300 h.p. each in an extension of the present engine-house. As to provision for still further extension, the buildings are so designed that they may be duplicated by adding another engine-house at the back of the boiler-house, the boiler-house itself being so arranged that the boiler horse-power installed can be doubled to deal with the engines in this second engine-room. The front of the new works will be built in ornamental stonework, and will constitute one side of the new engine-room. The engine-room will run parallel to the roadway, and behind it will be the boiler-house. At the north end of the building will be an economiser house, feed water storage tanks, and ash bunkers. The interior of the engine-room will be built with glazed bricks of an ornamental design. The portion that is being built at present will be capable of accommodating three engines, having a total horse-power of 6,000. The electric generators will each have a capacity of 1,000 kilowatts. Surface condensing plant will be installed to be used in conjunction with these engines, and will be operated in connection with the cooling tower that is now being erected over the reservoir. An electrically-driven 30-ton overhead crane will be installed in the engine-room for the purpose of erecting or repairing any parts of the plant. The engine-room, when built, will be capable of containing five units of plant, having a total capacity of 10,000 horse-power, and the second engine-room at the back of the boiler-house will be of the same capacity. It is intended to instal six boilers, having a total capacity of 4,800 horse-power. The gases from these will pass into a main flue, which will conduct them through an economiser and into the chimney. The chimney will be built of brick, in circular form, with an internal diameter of 13 ft. It is to be 200 ft. high. A large coal store has been arranged over the centre part of the boiler-house. The city electrical engineer is Mr. R. A. Chattock, and Mr. S. T. Dalton, Mr. W. Jones, Mr. E. S. Saunders are assistant engineers; Mr. W. A. Atkinson is clerk of the works; Mr. R. Mawson and Mr. R. Hudson are the architects, and Messrs. Obank the contractors.

LICHFIELD SEWERAGE.—The Lichfield City Council, after interviewing three engineers, have appointed Mr. J. R. Elliott, C.E., of Nottingham, to prepare plans and report upon the city sewerage.

FOREIGN.

FRANCE.—A large tapestry is just being completed at the Gobelins, which is to decorate one of the rooms in the Bibliothèque Nationale. It is after a cartoon by M. Ehrmann, and symbolises the French Renaissance, and includes portrait figures of all the great artists of that period, while the background shows representations of the most celebrated châteaux. The tapestry will complete the series of which the other four tapestries represent "Antiquity," "The Middle Ages," "Writing," and "Printing."——M. Louis Dumoulin has received a State commission to paint a large picture representing the arrival of the Imperial train at one of the stations, either Dunkerque, Reims, or Compiègne.——At the Sèvres factory a room has been devoted to a historic collection of pieces of ceramic ware dating from the first manufacture at Vincennes, under Louis XIV., as well as specimens of the First and Second Empire periods, and works that figured in the Exhibitions of 1889 and 1900.——The Public Works Department has approved of the design for a viaduct at Fades, on the line from Saint-Elvi to Pauniat. This viaduct, which is to cross the deep valley of the Sioule, will be 376 metres in length, and 132 metres in height above the valley level.——The pupils of the Ecole des Beaux-Arts have addressed a memorial to M. Paul Dubois, the eminent sculptor who directs the establishment, petitioning that, during the work of alteration and repair in various parts of the building, the clay sketches, drawings, and paintings executed during a long time past by the competitors for the Prix de Rome, should not be injured or destroyed. These works constitute in fact a highly interesting collection, many of them signed by names which have since become famous. Mention may be specially made of an equestrian figure executed by Regnault when a pupil in the school.——The occasion of the visit of the Czar is to be taken to inaugurate the new Hôtel de Ville of Dunkerque, designed by M. Louis Cordonnier of Lille; a fine building in the style of the Flemish Renaissance.——The jury in the competition for a circus theatre at Troyes have awarded the first premium to M. Henri Schmidt, the second to M. André Bérard, the third to M. Emile Robert, and the fourth to M. Bruno-Pelissier—all of Paris.

MISCELLANEOUS.

PUBLIC IMPROVEMENTS, FULHAM.—The Fulham Board of Guardians have passed resolutions consenting (1) To the provision of increased boiler accommodation, the erection of a chimney at the workhouse, and to the execution of works and the provision of machinery and apparatus for the purpose of lighting by electricity the workhouse, infirmary, and board offices of the parish, in accordance with plans to which the Local Government Board have affixed their seal, subject, nevertheless, to such modifications as the Local Government Board might direct. (2) To the expenditure for the above purposes of a sum not exceeding 11,111*l.* (3) To the borrowing of such an amount or such part as might be necessary.

A NEW THEATRE, HAMMERSMITH.—It is stated that, with the concurrence of the Charity Commissioners, a site has been taken for the building of a theatre at the corner of Rowan-road and the main road, Hammersmith, upon land which belongs to the trustees of a charitable endowment.

PUBLIC HEALTH (LONDON) ACT, 1891; PROPOSED AMENDMENT.—From the Report of Dr. J. King Warry, M.D., on the Sanitary Condition of the Hackney District for the year 1900, we make the following extracts:—My experience of the last few years shows that there is need for some amendment of the Public Health Act, which will enable Local Authorities to deal more promptly with recalcitrant owners of property in respect to the cleansing of rooms, especially those occupied by the working and lower classes. To the credit of the majority of property owners most of the cleansing is done on the service of a notice by the Local Authority; but there is a certain class of owners who will not do such work unless by a magistrate's order. At present, in order to obtain a magistrate's order to cleanse the walls and ceilings of an occupied room, it is necessary to take it as a general nuisance under Section 2 of the Public Health (London) Act as a nuisance, or dangerous, or injurious to health. It is extremely difficult to prove that a dirty ceiling or wall is dangerous or injurious to health in any special sense. Certainly cleanliness of dwelling, as well as person, is essential to good health, and when they are so dirty that they give rise to a stuffy or unwholesome smell, they tend to lower the vitality of the inmates. But the Local Authority should have the power of dealing with this before it reaches the condition to injuriously affect the health of the occupants in a similar way to that in which factories, or workshops, or bakehouses are periodically cleansed. The law is adequate to deal with the cleansing of these. Tenements, houses registered under the by-laws for houses let in lodgings are also required to be cleansed thoroughly once a year by the landlord. Now this provision of annual cleaning should be applied to every house occupied by the working classes; if not, these houses ought to at least be put on as high a sanitary level as workshops under the Public Health Act (London), 1901, that is that the cleansing of any room should be compulsory on the certificate of a Medical Officer of Health. If this amendment of the law could be effected, the work of the Local Authority in dealing with dirty rooms would be much simplified and made more effectual.

ALL SAINTS' CHURCH, DALSTON.—The fire that broke out a few days ago caused serious injury to the fabric and equipment of the church. The official report sets forth that one-third of the ground floor and the gallery, with their contents, are severely damaged by fire; 90 ft. of roofing are damaged by fire and cutting away, and the rest of the building and its contents are damaged by heat, smoke, water, and breakage. The church was begun after Hardwick's designs and consecrated on July 4, 1856; the aisles were built and galleries were added afterwards by Mr. Knightley, so as to increase the capacity of the church to that for 1,500 persons. The organ was by Willis, 1857.

STREET IMPROVEMENT, HULL.—The scheme of street improvement which the Right Hon. Walter

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Long, President of the Local Government Board, will formally inaugurate in the middle of next month is the greatest and most important undertaken by the Hull Corporation. To reach Prospect-street from Monument Bridge people had to travel round by way of Waterworks-street and Chariot-street. Through the centre of the block of property facing Monument Bridge a fine road 80 ft. in width has been driven, and an uninterrupted vista from the bridge to Beverley-road corner, nearly a mile in length, now meets the eye. Not a few old streets, containing old, worthless, insanitary property, have been completely demolished and their names taken off the street nomenclature of the city. The sites of the new street, so soon to be known as King Edward-street, have realised large prices, several about 50*l.* per square yard, as the thoroughfare will undoubtedly take front rank in the business avenues of Hull. Another improvement which will be commenced in 1902 is the demolition of the Junction-street and St. John-street block of buildings, and the formation of a great central square, measuring 272 ft. from north to south, and 216 ft. from east to west. This open square will be in the heart of the city, and a little over an acre in extent. The scheme also provides for the erection of thirty-four shops of varying frontages, and the provision of a public hall, with retiring-rooms, together with three large reception halls. The expenditure upon land and buildings in connexion with this improvement is estimated at 92,000*l.* The present gross rental of the property, which belongs to the Corporation, is 4,861*l.* After the improvement is completed, it is estimated that the Corporation coffers will be enriched by an additional annual sum of 3,872*l.*—*Leeds Mercury.*

THE LAND REGISTRY.—The annual returns prepared at the Land Registry, Lincoln's-inn-fields, cover the twelve months ended with March 31 last. The report sets forth that, whilst no registrations have been effected under the Small Holdings Act of 1892, there were 19,885 separate titles on the register at the close of last year under the Land Transfer Act of 1875 and the Land Registry Act of 1862; the total number of transactions registered during the year 1900 was 19,678, and their value (where ascertainable) was 24,401,753*l.* The fees received during the period of twelve months in the Land Registry amounted to 53,802*l.*, the salaries and expenses to 38,393*l.*; the salaries and expenses in respect of the working of the Land Transfer Acts of 1875 and 1897 amounted to about 32,800*l.*, and the receipts from fees under those Acts to 37,600*l.* In the year 1900 were registered on first registration the titles to 2,585 freehold estates, valued at an aggregate of 7,181,651*l.*; on December 31 last there were 2,820 separate titles on the register, and the total number of separate titles that had been removed from the 1862 register on that date (otherwise than by transfer to the 1875 register) was 270, representing about 80 acres out of a total area of 40,117 acres, valued at 5,340,437*l.*

FULHAM WORKHOUSE TO BE LIGHTED BY ELECTRICITY.—The Local Government Board has sanctioned the scheme of the Fulham Guardians for engineering works at the infirmary, and for lighting by electricity the offices, workhouse, and infirmary. At the last meeting of the Guardians it was decided to instruct Mr. Medhurst (the engineer) to prepare the necessary specification of works, plans and forms of tender, the estimate being 10,220*l.* Mr. W. R. Sayer said that the expenditure would result in a saving to the ratepayers, and that it would be cheaper for the Guardians to make their own current than to take it from the Borough Council.

THE SANITARY INSTITUTE.—A donation of 100*l.* has been promised by the Leeds Fireclay Company to the fund for the new Building and Endowment Fund of the Parkes Museum.

GREENCOAT TECHNICAL CLASSES, CAMBERWELL.—The technical and art classes, held at the Greencoat School, Camberwell Green, S.E., will resume work for the winter session on Monday, September 23. These classes are in affiliation with the Technical Education Board of the London County Council, the City and Guilds Institute, and the Board of Education. Of late their usefulness has been considerably increased by the help of the Technical Education Board's grants in aid of equipment. By this means a valuable collection of models and apparatus has been provided for the use of students employed in the building trade.

WINDOW, ST. PETER'S CHURCH, STAINES.—A large seven-light stained-glass east window and a small three-light side window have recently been placed in St. Peter's Church, Staines. They are from the designs and cartoons of Mr. E. Fellowes Prynne, brother of the architect of the church, Mr. George Fellowes Prynne, and have been carried out by Mr. James Jennings. The subject of the large window is the "Church Triumphant," and of the small one "The Nativity and Adoration of the Magi and Shepherds."

CAPITAL AND LABOUR.

BUILDING TRADE DISPUTE AT BATH.—About one hundred masons and bricklayers employed by Messrs. Jacob Long & Sons, of Bath, have left work, refusing to labour with five men who have incurred penalties under the Operative Masons and Bricklayers' Union which they refuse to pay. The men required that they should either pay up or that Messrs. Long should discharge them, and they also demanded that the employers should agree henceforth to employ only society men. The employers, of course, refused, and called upon the assistance of the Master Builders' Association, who at a recent meeting passed the following resolution:—"That the members of this Association condemn the coercive action of the executive of the Operative Masons and Bricklayers' Union in compelling their members to strike on account of the employment by Messrs. Jacob Long & Sons of non-union men, and consider such action as an unjustifiable breach of the working rules mutually agreed upon on June 13, 1901, and that unless the strikers return to work by 9 a.m. on Friday next, September 13, and comply with the same working rules, the members of this Association will reluctantly lock out the union masons and bricklayers in their employment, and take such steps as they may be advised to retain the right as hitherto to employ union and non-union men without distinction." The resolution was communicated to the men. There are about 400 masons and bricklayers in Bath, and something like 1,500 or 1,600 men are engaged in the whole building trade, which would be at a standstill in the event of a strike.—The men, acting on advice from the headquarters of the trade-union, have returned to work.

THE BUILDING TRADE DISPUTE IN BRADFORD.—It may now be taken for granted that the dispute in the Bradford building trade, which commenced nearly five months ago, has passed beyond the probability of any other settlement than that resulting from the gradual introduction of non-union labour into the places previously filled by union labour in Bradford, and the removal of the unionists to other towns where no quarrel of the kind is in an active state. Masters and union men alike decline to "budge" from the positions which they have taken up, and neither party has now any desire for intervention. The employers state that they are rapidly filling up all vacancies with non-union workmen, are quite satisfied with the quality of the new men, and do not intend to have relationships with the trades unions concerned at any future time. The labour bureau which has been conducted by Mr. W. A. Forshaw for some weeks past in the interests of the Building Trade Federation is intended to be a permanent institution for the registering of individual workmen. Application for joiners' places now have to be refused, wallers are plentiful, banker hands and general labourers are coming forward freely, and masons (though not yet numerous enough to satisfy all requirements) have presented themselves in sufficient numbers to justify the hope that in a couple of weeks or so there will be no remaining vacancies. The slight deficiency of masons, of course, hinders the work of other departments in which the workmen follow on in the ordinary course of building; but, by an interchange of men, the employers are keeping the work which is of actual importance going on well. It is expected, for instance, that the work in connexion with the Cartwright Memorial Hall will be in full swing in the course of another week. The foregoing represents the employers' view of the position, and the representatives of the displaced trades union workers would not seriously traverse this statement except in two or three respects. The trades union officials hold that the imported non-union labour is inefficient and unsatisfactory, and, though it may triumph for a time, will be beaten out again in the long run. Their opinion is that the employers are acting with the support, and really in the interests, of the National Federation of Master Builders, whose habit it is to select what they regard as a weak labour centre from the trades union point of view, and make some sacrifice in order to turn out the union labour for a time. The unionists appear to look upon the resultant displacement with perfect equanimity, as a matter in relation to which time will work out its revenges. The Amalgamated Society of Carpenters and Joiners has 67,000 members, of whom only 1,200 are out of work by reason of strikes and lockouts throughout the country. The society, having large accumulated funds, can continue paying displaced members for an indefinite period, and has, in fact, increased the rate of remuneration to these men recently. The masons are similarly well provided for, having a powerful society with ample funds at its back, enabling them to snap their fingers at any action which the employers may take. The labourers also have their own society, which is keeping them in fairly comfortable condition. All the union men prefer to transfer their homes to some other city or town rather than give way to the masters' demands, because in their opinion compliance with these requirements here would encourage the National Federation to open the attack elsewhere.—*Bradford Observer.*

LEGAL.

CASE UNDER THE 1894 BUILDING ACT.

MR. CHARLES ANSELL, builder, of Chicheley-street, York-road, was summoned recently at North London Police-court by Mr. Payne, District Surveyor for East Hackney, for that in doing certain work at the Brunswick Arms public-house, Hackney, he acted contrary to the London Building Act of 1894. Mr. Wootten, barrister, defended.—Mr. Payne's case was that the defendant had placed a new flap to the cellar of the public-house without giving him notice as District Surveyor, and had used in the construction deal instead of some hard and incombustible material.—Mr. d Eyncourt said a cellar flap could not be made of anything but wood. The Act of Parliament, moreover, gave them no ground to go upon, and the summons would be dismissed, with 5*l.* 5*s.* costs.

ANCIENT LIGHT DISPUTE AT WAKEFIELD.

THE case of Archers, Limited, *v.* Elvey, came before the Lord Chief Justice of England sitting as Vacation Judge on the 18th inst., on a motion by the plaintiffs for an interim injunction to restrain the defendant from building so as to interfere with the plaintiffs' ancient lights.

Counsel in support of the application stated that the plaintiffs' property was a lodge on the Plumpton House Estate, Wakefield, and by a wall which the defendant was erecting the light coming to the windows of the lodge, which was now used as an office, would be materially affected.

His lordship stated that he had read the affidavits filed, and asked Mr. Compston, the learned counsel appearing for the defendant, if his client would give an undertaking to pull down at the trial if the judge held that the plaintiffs were right?

Mr. Compston said he could not do so, because there were reasons why his lordship should not interfere at this stage of the case. If there was any interference with the plaintiffs' light it was of the most trivial character.

The plaintiffs' counsel stated that the injunction was claimed on two points: firstly, that the lights were ancient; and, secondly, that even if they were not, the defendant could not block them, because he conveyed the property in question to the plaintiffs with the then existing unobstructed lights, and he was now derogating from his part by building on his own land and obstructing the light.

In the result his lordship directed that the defendant must be restrained from building further until the trial, and granted an interim injunction in those terms. He also directed that the trial should be expedited, and that the costs of the application should be costs in the cause.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

9,047.—A ROAD-SWEEPING MACHINE AND ELEVATOR: *W. H. Melvin and A. Mann.*—The mud and other refuse is swept into a trough at the top of an inclined plate by means of a rotating brush upon a frame carried by side-wheels upon an axle and a front-wheel upon a swivelling front carriage. The refuse is conveyed by a screw that turns in the trough into a receiver whence a screw lifts it up to a swivelling spout for discharge; chain-gearing from a side wheel of the frame drives the brush and the conveying-screw in the trough, and a chain and bevel gearing drives the screw which raises the mud out of the trough; in another form bearings adjusted with screws carry the brush and the shaft. The receiver or casing is fitted with a manhole, and scrapers upon chains around sprocket-wheels convey the mud up the inclined plate of which the lower portion slides upon the upper portion which a spring forces against the road.

9,113.—A WOOD-MORTISING MACHINE: *F. Thomson.*—A crank-handle and a train of gearing move a sprocket-wheel which drives the pitch-chain to which the cutters are affixed. A screw feeds forwards a sliding frame which carries the chain. The cutters are set so as to project in turn from opposite sides of the chain and are adjusted with a slot and a screwed pin. For increasing the length of the cut mortise, one separates guide-rollers that sustain the forward end of the chain, and forces apart, with a wedge, the hinged arms upon the ends of which the guide-rollers are mounted.

9,120.—CONSTRUCTION OF FLOORS: *F. C. Pelton and L. E. Mosher.*—Perforated metal sheets, that may be wrapped around anchoring rods at their edges are employed for strengthening the concrete, or similar, blocks, and wedge-shaped supporting blocks made of concrete layers applied to sheets of fire-proof fabric are fitted between metal beams or guides, the plastic layers being folded around perforated strips or cores of sheet-metal. The blocks can then be pressed into the required shapes, and their shoulders will hold up the flooring and ceiling blocks. Bent wires may be used for suspending the ceiling, and a skeleton of metal rods and strips will serve to strengthen the blocks.

9,128.—DREDGING APPARATUS: *A. F. Smulders.*—A rotary pump raises the soil and lowers the end of a pipe on to which a shut-off valve is fitted, and by means of a reversing valve the soil will be discharged through a pipe on to the bank or through another pipe into the barge. The barge is emptied by the closing of a valve and the reversal of the reversing valve and of an auxiliary valve.

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9,131.—PIPE MOULDING: *C. J. Kielberg.*—A tube, upon which is mounted a screw, slides upon a rotating or fixed core. When the screw is at its lowest position the cement is poured into the mould cylinder where it may be compressed by screwing the tube upwards through it By this invention the movable core and compression screw specified in No 18,353 of 1899 are dispensed with

9,140.—A PACKING FOR JOINTS: *C. H. Meriwarth and F. Conlin.*—A packing for pipe-joints and similar objects consists of two wire rings (for which washers can be substituted upon occasion), of which the inner one is made of a soft metal and the outer one of some harder metal; there are strips—to be wound around a pair of bolts—for facilitating the centering of the packing.

9,215.—APPLIANCES FOR PILE-DRIVING AND DEEP-BORING MACHINERY: *C. L. S. Isler and H. F. Broadhurst.*—Cams and gearing from the shaft drive a lever, to which the rope around the head-pulley is passed; a screw and a split feeding-nut feed out the rope, ratchet gear and a hand-lever near the pivot of the lever serving to drive the screw, whilst an adjustable block varies the leverage.

9,229.—ELECTRICAL TESTS AND RESISTANCES: *Willans & Robinson and G. L. Addenbrooke.*—For testing polyphase or single alternating-current meters, transformers, and generators, &c., are devised loads formed of non-inductive resistances and variable inductances connected parallel wise. A variable inductance is composed of strip or wire coiled through laminated iron frames which are disposed in radial arrangement about a common non-magnetical centre, and adjustable air-spaces in the circuits are formed by causing the ends or outer sides of the frames to be moved separately by means of slit holders and screws; in another variety two nuts which are linked to the outer sides of the frames are mounted upon a middle rotatable right-and-left-handed screw, whereby an adjustment at one and the same time will be effected, or one rectangular iron frame having one of its sides adjustable may be substituted.

9,275.—PROCESS OF HARDENING LIME OR ARTIFICIAL SANDSTONE: *P. Prior.*—For hardening the raw building material the inventor mixes it with alkalies or their salts—say, potassium carbonate or sodium carbonate—and then exposes the compound to superheated steam under high pressure, or he first volatilises the alkali and mingles it with the superheated steam, or causes the steam to pass over alkali laid in pierced pans within the hardening vessel.

9,289.—FIXING OF FENCING-WIRE: *J. Webb.*—A wire-straining appliance has arms hinged together and upon them are mounted pivoted clamps, of which the ends are serrated to a curve which is eccentrical as regards the pivots. When the clamps are turned the wires become gripped between the serrations on the ends of the clamps, and serrations upon the hinged arms, which are worked with a nut and screw or a screwjack; hooked and bolted clips fasten the looped ends of the wires.

9,342.—A SPRING HINGE FOR DOORS: *A. L. Stump and F. Brucker.*—A plate fastens a socket to the door-frame, and to the outer end of the socket is secured one end of the spring—its other end being set so as to bear against a sliding plate which is to be drawn out with one of two pins attached to a socket upon the double swing-door, when the door is quite opened one of the pins will pass into a rebate in the outer end of the door-frame socket, and so keep the door in that position.

9,354.—MATERIALS FOR BRAZING: *A. Vogt.*—After the objects have been coated with a protecting composition, and (as to their surfaces which are to be joined) a solution of water-glass and borax, they are heated and then put into the molten brazing material. For the composition an admixture is made of carbon, hydrated oxide of iron, with powdered asbestos or steatite, and (if needed) an aluminium oxide, together with beer, glue solution, or some such binding agent.

9,361.—A STAFF FOR LEVELLING PURPOSES: *G. Hilscher.*—In order to simplify the process of "correcting" when the staff has been observed through the telescope, the inventor provides a staff which is marked with two sets of graduations, either way, from a zero line, and having behind it a graduated foot that will slide adjustably within staples. In correcting for the height of the telescope and for its angle of elevation when one seeks to ascertain the difference of level between two objects, the staff should be raised upon its foot until its zero is horizontal with the height of the telescope.

9,422-3.—MEANS OF EXTINGUISHING FIRE: *H. B. Febiger.*—For extinguishing fire with refrigerated gases the inventor causes some non-combustion-supporting gas to be drawn by a fan from a receiver into the refrigerating chamber, and thence into the closed apartment where the fire is. For cooling the chamber a charge of sulphurous dioxide, or ammonia, under pressure in a receiver is caused to flow through a pipe-coil into the chamber where it will mingle with the gas.

9,469.—ELECTRICAL ENERGY METERS: *A. Peloux.* In the case of an induction motor meter for single alternating currents and having a conducting disc or cylinder driven with a shunt magnet and main current coils displaced anglewise on opposite sides of the cylinder, the inventor contrives to minimise the retardation arising from eddy currents due to the increase of the main current coils when the main current is large. He either provides additional compensatory driving force by means of a second winding upon an electro-magnet, which a main current transformer supplies with current, or provides for keeping constant the total magnetical flow through the cylinder or disc. For the latter purpose he causes a rotating disc to be driven by the inter-action of an electro-magnet in a highly inductive shunt circuit and displaced coils, which are in non-inductive shunt circuits that contain the secondaries of two main current transformers. Other variant forms of the invention are specified.

9,481.—FITTINGS FOR MATHEMATICAL DRAWING INSTRUMENTS: *A. J. Thornton.*—For a firm attachment of a needle-point it is held by its extreme end only in a hole in the split socket at the end of the compass-leg, which is made of tempered steel; through a nut carried by a screw is passed the upper part of the needle, which will become secured when a milled nut is turned so as to draw the other nut into a recess cut in the leg.

9,487.—BEARINGS FOR PLUG-COCKS: *J. Glover and Royles, Limited.*—The invention relates more particularly to plug-cocks used under high pressure; a gland, embodying an auxiliary gland, holds the plug in its casing, and the plug bears against packing-rings; between the plug and the additional gland is inserted a ball-bearing formed of balls (or rollers) and rings; the bearing may be arranged at one or both of the ends of the plug.

9,492.—ELECTRICAL COUPLING AND DISTRIBUTION: *W. M. Douglas.*—Three pieces of metal, fitted with binding-screws, are used with a ceiling-rose or some similar connection, for a two-wire supply. Loops of the supply wires are connected with the first and second metal pieces, whilst the first and third pieces are connected with the lamp. Wires that connect the second and third pieces with a switch serve to complete the circuit. Insulating partitions keep the three pieces separated from one another. The couplings are specified as being available for connecting lamps upon two different circuits, and so on, and as rendering unnecessary the making of joints and long loops in the wires.

9,494.—PILE DRIVING, STAMPING, AND SIMILAR MACHINERY: *E. S. Brett.*—The inventor's object is to increase the travel of the head with the same extent of the oscillation of the driving-shaft. In the case of a pile-driver he mounts the piston of a rotary engine upon a driving-shaft of which the arms support a pulley which takes a bight of the rope, and when the arms are oscillated in one direction the head will be raised twice the distance which is moved by that pulley; the travel may be still further extended by using a pair of pulley blocks instead of only one. The inner end of the rope is passed over a pulley mounted above the piston and thence to a rope barrel having a pawl and ratchet-wheel for adjustment of the position of the head. Confer also No. 2,924 of 1890.

9,512.—TREATMENT OF SEWAGE, &C.: *E. W. Ives.*—A pipe conveys the sewage or foul water from a screening-chamber into a mixing-channel, beyond which is the settling-tank. The screening-cage has bars which break up some of the solids. Two pipes (which are joined to a short pipe upon which is mounted a set of distributing-arms) convey the sewage, &c., from the mixing-channel into the tank, of which the lower portion, cone-shaped, constitutes a sump for the sludge, into which water or air may be forced. Filtering-bodies receive the liquid portion of the sewage.

MEETINGS.

FRIDAY, SEPTEMBER 20.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, B.A, on "Duties of a Sanitary Inspector: Indoor." 7 p.m.

SATURDAY, SEPTEMBER 21.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Wimbledon Sewage Works. 3 p.m.

Northern Architectural Association.—Excursion meeting. Members to assemble at the south end of Sunderland Central Station, at 3.5 p.m., upon the arrival of the 2.32 p.m. train from Newcastle.

TUESDAY, SEPTEMBER 24.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, B.A., on "Duties of a Sanitary Inspector: Offensive Trades and Trade Nuisances, &c." 7 p.m.

WEDNESDAY, SEPTEMBER 25.

Builders' Foremen and Clerks of Works' Institution.—Quarterly meeting of the directors. 8 p.m.

SATURDAY, SEPTEMBER 28.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Richmond Main Sewerage Pumping Station and Purification Works, Kew Gardens. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 5.—By Messrs KEMSLEY (at Birmingham).

Shrewley, Warwick.—Pinley Hill Farm, 86 a. 3 r. 31 p., f.	£2,600

By PERKINS & SONS (at Romsey).

Braishfield, Hants.—Wilkins Farm, 130 a., f. and c.	1,600
Pitt Farm, 114 a., f. and c.	1,070
Awbridge, Hants.—Yew Tree Farm, 75 a., f. and c.	2,257

By T. WALKER & SON (at York).

East Lilling, Yorks.—Thornton Cottage Farm, 248 a. 0 r. 33 p., f.	10,200
Thornton-le-Clay, Yorks.—A freehold residence and 7 a. 2 r. 21 p.	650
Flaxton, Yorks.—Three freehold closes, 11 a. 2 r. 27 p.	600
House, blacksmith's shop, and 11 a. 3 r. 37 p., f.	750
Freehold house and three cottages	515
York.—Monkgate, freehold warehouses, stabling, and yard	800

By Messrs. COBB (at Sheerness).

Sheerness, Kent.—74, 76, 78, and 80, High-st., area 6,230 ft., f.	2,320
35, 41, and 43, James-st., f.	535
7, 19, 29, 35, and 47, Clyde-st., f.	930
50 and 52, Broad-st., f.	200
105 to 119 (odd), Hope-st., f.	710
4A to 4E, Cross-st., f.	500

September 7.—By ROBERTS, SON, & TORY (at Blandford).

Melcombe Bingham, Dorset.—Cothayes Farm, 160 a. 2 r. 23 p., f.	3,150
Coombe Wood and enclosures, 115 a. 3 r. 22 p., f.	2,200
Links Plantation, &c., 39 a. 2 r. 28 p., f.	1,700

September 9.—By WILKINSON, SON, & WELCH (at Brighton).

Brighton, Sussex.—3, Norfolk-ter., f., r. 120*l.*	1,500
14, Eaton-pl., f.	855
12, Preston Park-avenue, f., r. 100*l.*	1,550
17, Beaconsfield-villas, f.	1,225

September 10.—By RUTLEY, SON & VINE.

Camden Town.—27, Rochester-rd., u.t. 42½ yrs., g.r. 5*l.*	510
Somers Town.—52, Barclay-st., u.t. 19 yrs., g.r. 2*l.* 10s.	200
Holloway.—39, St. John's Park, u.t. 50 yrs., g.r. 7*l.* 10s., r. 49*l.*	430

By WILLIS & CROUCH.

Hampstead.—26, Belsize-avenue, u.t. 70 yrs., g.r. 35*l.*, e.r. 135*l.*	1,000

By G. LOVEITT & SON (at Coventry).

Berkswell, Warwick.—The Railway Inn and two cottages adjoining, f., r. 33*l.* 10s.	2,300
Two freehold fields, 6 a. 2 r. 11 p.	360

By J. & W. JOHNSON & Co. (at Masons' Hall Tavern).

Ilford, Essex.—3 and 4, Grafton-villas, also the Grafton Stores (with off-licence), u.t., 36 and 46 yrs., r. 140*l.*	3,950

September 11.—By FULLER, HORSEY, SONS, & CASSELL.

Wandsworth.—Standen-rd., the Berrenberg Electric Lamp Factory, area 3,000 yards, u.t. 95½ yrs., g.r. 35*l.*, with goodwill, plant, machinery, &c.	4,000

By Messrs. CRONK.

Ightham, Kent.—Hazeldene and 3 a. 2 r. 5 p., f.	1,480
Fairview and 5 a. 0 r. 38 p., f.	1,500
A freehold cottage residence and 3 a. 2 r. 12 p.	920
Downe, Kent.—Orpington-rd., &c., five plots of freehold building land, 10 a. 2 r. 12 p.	1,055

By E. H. HENRY.

Clapham.—11, Park Hill, u.t. 56½ yrs., g.r. 21*l.*, e.r. 70*l.*	385
31, Lilleshall-rd., u.t. 69 yrs., g.r. 4*l.* 15s. 6d.	450
Wandsworth.—45, Devereux-rd., u.t. 89 yrs., g.r. 10*l.*, r. 45*l.*	450

By DOUGLAS YOUNG & CO.

Battersea.—59, Lavender-rd., u.t. 38½ yrs., g.r. 3*l.* 10s., r. 25*l.*	230
Clapham.—13, Paradise-rd., f., r. 39*l.*	440
57, Paradise-rd., f., r. 39*l.*	445
Putney.—Upper Richmond-rd., f.g.r. 8*l.*, reversion in 89 yrs.	185

September 12.—By C. C. & T. MOORE.

Mile End.—260 and 262, Oxford-st., u.t. 22 yrs., g.r. 8*l.*	380
22 and 24, Apsley-st., u.t. 21 yrs., g.r. 7*l.*	350
8, Duckett-st., also the Black Horse b.-h., and 75 and 77, Skidmore-st., u.t. 13 yrs., g.r. 30s., r. 92*l.* 8s.	160
Peckham.—8, Edith-rd., u.t. 63 yrs., g.r. 7*l.*, e.r. 40*l.*	350

By MARK LIELL & SON.

Bow.—34 and 36, Ford-st., f.	480
3 and 5, Caxton-st., u.t. 50 yrs., g.r. 7*l.* 10s.	600

By MARTEN & CARNABY.

Dulwich.—5, 6, 7, and 8, Uxbridge-villas, u.t. 79 yrs., g.r. 26*l.*, r. 120*l.*	1,050

Contractions used in these lists.—**F.g.r.** for freehold ground-rent; **l.g.r.** for leasehold ground-rent; **i.g.r.** for improved ground-rent; **g.r.** for ground-rent; **r.** for rent; **f.** for freehold; **c.** for copyhold; **l.** for leasehold; **e.r.** for estimated rental; **u.t.** for unexpired term; **p.a.** for per annum; **yrs.** for years; **st.** for street; **rd.** for road; **sq.** for square; **pl.** for place; **ter.** for terrace; **cres.** for crescent; **yd.** for yard.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Cottages	Roscommon (Ireland) R.D.C.	Not stated	Sept. 21

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Sewerage Works, near Uppingham	Hallaton R.D.C.	Coales & Johnson, Engineers, Market Harborough	Sept. 24
Road Works, Annan Bridge	.....	W. Tait, Town Offices, Moffat, N.B.	do.
Villa, Norham, near Berwick-on-Tweed	.....	J. L. M. Sherriff, East House, Norham	do.
Vicarage, Field Broughton	.....	Wright & Son, Surveyors, Lancaster	do.
*Pipe Surface Water Drain	Willesden District Council	O. Claude Robson, Engineer, Dyne-road, Kilburn, N.W.	do.
*Electricity Works	do.	do.	do.
*Making-up Roads	Tottenham U.D.C.	Engineer to Council, Offices, 712, High-road, Tottenham	do.
Paving Works	Middlesbro Corporation	F. Baker, Civil Engineer, Municipal Offices, Middlesbro'	Sept. 25
Sewers	Marlborough (Wilts) Town Council	E. L. Gwillim, Town Offices, Marlborough	do.
Workhouse Alterations	Mitford, &c., Guardians	J. B. Pearce, Architect, Norwich	do.
Reservoir, near Dumbarton	.....	Kyle & Frew, Engineers, 140, West George-street, Glasgow	do.
Additions to Asylum, Rainhill	Lancs Asylums Board	J. Gornall, County Asylum, Rainhill	Sept. 23
Waterworks	Bude (Cornwall) U.D.C.	B. Latham, Civil Engineer, Victoria-street, S.W.	do.
Railway Stores	Great Indian Peninsular Ry. Co.	J. J. Berry, Copthall House, Copthall-avenue, E.C.	do.
*Private Street Works	Tunbridge Wells Council	Borough Surveyor, Town Hall, Tunbridge Wells	do.
Water Main, Deganwy	Conway (N. Wales) Town Council	Borough Engineer, Town Hall, Conway	Sept. 27
Roads, Muswell Hill, N.	.....	Vigers & Co., 4, Frederick's-place, E.C.	do.
14 Houses, Pellon, Halifax	.....	M. Hall, Architect, 29, Northgate, Halifax	do.
Sewers	Barnsley R.D.C.	W. J. Lomax, Engineer, 11, Fold-street, Bolton	do.
*New Coastguard Buildings, Whitstable	Admiralty	Coastguard Station, Whitstable	do.
Sewerage Works	Lutterworth R.D.C.	W. H. Simpson, Civil Engineer, Leicester	Sept. 23
Additions to Destructor Works	Blackpool Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Tramways, &c.	Reading Corporation	J. Bowen, Civil Engineer, Town Hall, Reading	do.
*Alterations to Parish Church, Pelsall, Staffs	.....	T. H. Fleeming, 102, Darlington-street, Wolverhampton	do.
*North-East London Institute	The Governors	A. W. Cooksey, Esq., 4, Adam-street, Adelphi, W.C.	Sept. 30
*Blue Paving Bricks, &c.	Edmonton U.D.C.	G. Eedes Eachus, Engineer, Town Hall, Edmonton	do.
Isolation Hospital, Menston, Yorks	.....	Blackwell & Thomson, Architects, Leicester	do.
Sewers	Hale (Cheshire) U.D.C.	F. J. Lobley, Civil Engineer, Albert-road, Hale, Cheshire	do.
Reconstructing Buildings, Union-street, Glasgow	Caledonian Railway Company	J. Miller, Architect, 15, Blythswood-square, Glasgow	do.
School, &c., Wilson-street	Bristol School Board	Munro & Son, Architects, Baldwin-street, Bristol	do.
Fencing Works	Hornsea (Yorks) U.D.C.	W. G. Warburton, Surveyor, Hornsea	do.
Granite Setts	Heaton Norris U.D.C.	W. Hodson, Council Offices, near Stockport	do.
*Workmen's Dwellings	Wellington (Salop) U.D.C.	Clerk to Council, Church-street, Wellington, Salop	Oct. 1
Sewers	Bradford-on-Avon U.D.C.	S. Howard, Surveyor, Town Hall, Bradford-on-Avon	do.
Cemetery Chapel	Great Yarmouth Town Council	J. W. Cockrill, Surveyor, Town Hall, Great Yarmouth	do.
Drainage Works	Banffshire County Council	J. Barron, Civil Engineer, 1, Bon Accord-street, Aberdeen	do.
*School	Hornchurch School Board	S. J. Adams, Weston-road, Southend	Oct. 2
School	Brynmawr School Board	F. Baldwin, Architect, 13 Frogmore-street, Abergavenny	do.
Pumping Plant, &c	Littlehampton U.D.C.	H. Howard, Engineer, Town Offices, Littlehampton	do.
*Coastguard Buildings, Bexhill	Admiralty	Coastguard Station, Bexhill	Oct. 4
*Sewerage Works	Bideford Corporation	Baldwin Latham, Engineer, Parliament Mansions, Victoria-street	Oct. 5
Water Supply Works	Monaghan U.D.C.	J. H. M. Wilson, Civil Engineer, Monaghan	do.
Sewers	Bideford Corporation	B. Latham, Civil Engineer, 17, Victoria-street, S.W.	do.
*New Generating Station at Greenhill	Oldham Corp. Electricity Dept.	A. Andrew, Gas and Water Offices, Oldham	Oct. 8
*Public Baths and Library	Sheffield Health Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield	do.
*Tar-paving Materials	London County Council	Parks Department, 11, Regent-street, S.W.	do.
Hospital, Leigh-road, Pontypool	.....	R. Williams, Architect, 10 Clifford's-inn, Fleet-street, E.C.	Oct. 10
*New Visiting Rooms	Wilts County Asylum	County Surveyor, County Offices, Trowbridge	Oct. 12
*New Ward at Workhouse	Lambeth Guardians	Fowler & Hugman, Surveyors, 9, Craig's-court, Charing Cross	Oct. 15
*Laying-out and Building New Cattle Market	Braintree U.D.C.	A. & H. J. Cunnington, Great-square, Braintree	do.
*Town Hall	Cheltenham Corporation	Town Clerk, Municipal Offices, Cheltenham	Oct. 30
House, Ripon	.....	J. Young & Co., Architects, Market-street, Bradford	No date
40 Houses, Western Valleys, Mon.	.....	C. T. Evans, Architect, 8, Queen-street, Cardiff	do.
Engine House, &c., Meltham, Yorks	.....	W. Carter, Station-street, Meltham	do.
Kerbing, Skipton, Yorks	.....	W. H. Hutchinson, Embsay, Skipton	do.
Nine Houses, Dovercourt, near Harwich	.....	R. G. Kestin, 1, Colosseum-terrace, London, N.W.	do.
House, Canon Park Estate, Edgware	.....	H. M. Lawson, Architect, 40, Broadway, Ealing	do.
*Furniture for New Schools	Croydon School Board	The Clerk, School Board Office, Croydon	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Architectural Assistant	Coventry Corporation	Not stated	Sept. 23
*Three Building Inspectors	Tottenham U.D.C.	150*l.* per annum each	Sept. 24
*Clerk of Works	Middlesbrough School Board	3*l.* per week	Sept. 26
Clerk of Works	Carlton (Yorks) Parish Council	2*l.* 10*s.* per week	Sept. 27
*Clerk of Works	Derby Corporation	Not stated	Oct. 1
County Surveyor	North Riding County Council	Not stated	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxii.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks	1	14	0	per 1,000	alongside, in river.	
Rough Stocks and Grizzles	1	11	0	,,	,,	,,
Facing Stocks	2	12	0	,,	,,	,,
Shippers	2	8	0	,,	,,	,,
Flettons	1	8	6	,,	at railway depôt.	
Red Wire Cuts	1	14	6	,,	,,	,,
Best Fareham Red	3	11	0	,,	,,	,,
Best Red pressed Ruabon Facing.	5	5	0	,,	,,	,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.			
'Best Blue Pressed Staffordshire	4	4	6	per 1,000	at railway depot.	
Do., Bullnose	4	9	0	,,	,,	,,
Best Stourbridge Fire Bricks	4	2	6	,,	,,	,,
GLAZED BRICKS						
Best White and Ivory Glazed Stretchers	13	0	0	,,	,,	,,
Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	17	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers	16	0	0	,,	,,	,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.			
One Side and two Ends	19	0	0	per 1,000	at railway depot.	
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamfered, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,		

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PRICES CURRENT (*Continued*).

BRICKS, &c.

	£ s. d.	
Two Sides and one End	25 0 0	per 1,000 at railway depot.
Splays, Chamfered, Squints	24 0 0	" " "
Seconds Quality White and Dipped		
Salt Glazed	2 0 0	" less than best.
	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	34 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od.		per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath "	1 7	" "
Farleigh Down Bath	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks	2 1½	" "
Red Corsehill "	2 5	" "
Red Mansfield "	2 4½	" "
Hard York in blocks	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt
" " 6 in. Rubbed Ditto	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" " 2 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt
" " " 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3-in. do.	1 2½	" "

SLATES.

In. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1100 at ry. dep.
" best seconds "	10 15 0	" "
16× 8 best "	6 2 6	" "
20×10 best blue Portmadoc	10 18 0	" "
16× 8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green	11 2 6	" "
16× 8 " "	6 15 0	" "
20×10 Permanent green	10 0 0	" "
16× 8 " "	5 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	48 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. ornamental Do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" " "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
Fir timber: Best middling Dantzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (25 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
" " 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	15 0 0	16 0 0
" " " 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
" " " 3 in. by 9 in.	13 0 0	14 0 0
" " battens	10 10 0	11 10 0

PRICES CURRENT (*Continued*).

WOOD.

JOINERS' WOOD.

	At per standard. £ s. d.	£ s. d.
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine— First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 14 0	0 16 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders " "	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
" " galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 17 6	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0½	- - -
Thin "	0 1 2	- - -
Copper nails "	0 1 8	- - -
BRASS— Strong Sheet "	0 0 11	- - -
Thin "	0 1 1	- - -
TIN—English Ingots "	0 1 4½	- - -
SOLDER—Plumbers' "	0 0 7	- - -
Tinmen's "	0 0 8	- - -
Blowpipe "	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 6	per ton delivered.
Fine "	47 6	" "
Superfine "	88 6	" "
Coarse Keenes and Parian cement	55 0	" "
Fine do. do.	75 0	" "
Robinson's Fireproof Cement	50 0	" "
Do. Fine white, finishing (Exclusive of the ordinary charge for sacks.	55 0	" "
Whiting	27 0 to	30 0 " "
Cow hair for plastering	£9 0 0	" "

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
" " fourths	2¾d.	" "
21 oz. thirds	3¾d.	" "
" " fourths	3½d.	" "
26 oz. thirds	5d.	" "
" " fourths	4¾d.	" "
32 oz. thirds	6d.	" "
" " fourths	5¾d.	" "
Fluted sheet, 15 oz.	3¾d.	" "
" " 21 "	4¼d.	" "
½ Hartley's Rolled Plate	3d.	" "
⅜ " " "	3½d.	" "
¼ " "	4d.	" "

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes	0 2 10	per gallon
" " " in barrels	0 2 11	"
" " " in drums	0 3 1	"
Boiled " " in pipes	0 3 0	"
" " " in barrels	0 3 2	"
" " " in drums	0 3 3	"
Turpentine, in barrels	0 2 3	"
" in drums	0 2 5	"
Genuine Ground English White Lead	22 0 0	per ton
Red Lead, Dry	22 10 0	"
Best Linseed Oil Putty	0 9 0	per cwt.
Stockholm Tar	1 10 0	per barrel

VARNISHES, &c.

	£ s. d.	
Fine Elastic Copal Varnish for outside work	0 16 6	per gallon
Best Elastic Copal Varnish for outside work	1 0 0	"
Best Elastic Carriage Varnish for outside work	0 16 0	"
Best Hard Oak Varnish for inside work	0 10 6	"
Best Extra Hard Church Oak Varnish for inside work	0 10 6	"
Fine Hard Copal Varnish for inside work	0 16 0	"
Best Hard Copal Varnish for inside work	1 0 0	"
Best Hard Carriage Varnish for inside work	0 16 0	"
Extra Pale Paper Varnish	0 12 0	"
Best Japan Gold Size	0 10 6	"
Best Black Japan	0 16 0	"
Oak and Mahogany Stain	0 9 0	"
Brunswick Black	0 8 6	"
Berlin Black	0 16 0	"
Knotting	0 10 0	"
Best French and Brush Polish	0 10 0	"

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BRENTWOOD.—For drainage and sanitary work at the Hackney Schools, Brentwood, for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C.:—

	£	Time.
Doulton & Co.	2,300	6 months.
W. J. Clark	2,193	—
Davis & Bennett	2,100	3½ months.
West	1,887	4 "
Hoinville	1,750	3 "
Gibb & Co.*	1,649	4 "

[Architect's estimate, £1,950.]

DAGENHAM (Essex).—Accepted for the erection of new school at Marsh Green, for the Dagenham School Board. Messrs. Harrington & Ley, architects, 65, Bishopsgate-street Without, E.C., and Corn Exchange, Romford:—

Hawkins & Son, Peterborough £5,317 10

DARLINGTON.—For the erection of eleven houses, Woodlands-terrace, for Mr. W. Waterson. Mr. Frank Martin, architect, South End Chambers, Darlington. Quantities by architect:—

Johnson & Boyd	£4,422 0	Veitch & Johnson, Darlington*	£3,723 0
J. Jenkins	3,963 10		
Boyd & Sons	3,835 0		

[*See also next page.*

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DARTFORD.—For three Lancashire boilers, with pumps and other work, in the boiler-house at Joyce Green Hospital, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. :—

D. Adamson & Co...	£4,125	Anderton & Sons ..	£3,625
J. Adamson & Co..	4,040	Oldham Boiler Co...	5,586
Musgrave & Sons ..	4,027	Arnott & Co.	3,500
Tinkers, Ltd	3,987	J. Thompson	3,400
Holdsworth & Sons..	3,927	E. Danks, Birmingham*	3,400
Yates & Thom.....	3,916		
Moorwood & Sons..	3,775		

GRAVESEND.—For the erection of an electric light station, &c., for the Town Council. Mr. F. T. Grant, Borough Surveyor, Town Hall, Gravesend :—

Shelbourne & Co.	£8,342 o o	Thomas & Edge	£7,697 o o
Johnson & Sons	8,237 o o	Wallis & Son	7,557 o o
Beal & Hubbard	8,176 18 6	Hughes & Stirling	7,553 o o
Smith & Son..	8,175 o o	Multon & Wallis	7,533 o o
F. G. Minter	8,030 o o	F. & E. Davey, Southend-on-Sea*.....	7,094 o o
J. Lonsdale ..	7,837 o o		

Chimney Shaft and Foundations Only.

Blackburns, Nottingham £1,375

HOMERTON.—For repairs and redecoration to cottages in Sydney-road, for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. :—

Barrett & Power	£402 o o	Silk & Son	£285 o o
W. J. Clark....	333 o o	Starling & Son*	248 o o
G. Moore	287 10 o	Gibb & Co.	247 o o

[Architect's estimate, £250.]

HOVE.—For the execution of road works, &c., Julian and Melville roads, for the Borough Council. Mr. H. H. Scott, Borough Surveyor, Town Hall, Hove :—

Parsons & Sons, 118, Church-road, Hove*.. £251

[Julian-road, £172; Melville-road, £79.]

LONDON.—For Baptist Church, Lewin-road, Streatham, S.W. Messrs. George Baines and Reginald Palmer Baines, architects, 5, Clement's Inn, Strand, W.C. :—

Prestige & Co. ..	£4,347 o	Turtle & Appleton	£3,639 o
Geo. Parker	4,344 o	T. D. Leng.....	3,624 o
F. & H. F. Higgs	4,300 o	J. O. Richardson	3,536 o
Holliday & Greenwood	4,089 o	Battley, Sons, & Holness	3,515 o
Mattock Bros. ..	4,076 o	Johnson & Co.,	
Higgs & Hill....	3,890 o	Ltd., Belle Vue-road, Wandsworth Common, S.W.*	3,354 10
F. S. Minter	3,799 o		
Lascelles & Co...	3,661 o		
S. J. Scott.....	3,660 o		
Chessum & Son	3,657 o		

[Architects' estimate, £3,650.]

LUTON.—For stabling, workshops, van-shed, &c., at rear of Nos. 8 and 10, Manchester-street, for Mr. T. Sworder. Mr. A. Wilkinson, architect :—

Cain & Co.	£1,875 12	T. & E. Neville....	£961 o
G. Kingham	1,353 o	A. D. Batson.....	960 o
D. Parkins.....	1,107 o	G. W. Pryer	960 o
Godfrey & Rumbles	1,042 o	Turner.....	947 10
Mallet & Wood..	1,002 o	G. Smart.....	929 o
J. Tomkins.....	1,000 o	Taylor.....	827 18
G. Buckingham..	964 o	A. Mardle*	826 6

[All of Luton.]

NEW BROMPTON.—For the erection of school buildings for 1,230 children, to be known as the Richmond-road Schools, for the Gillingham and Grange Urban District School Board. Mr. H. Dighton Pearson, architect, 27, Chancery-lane, London, W.C. Quantities by Messrs. Leaning & Sons :—

Chessum & Sons	£15,074 o o	T. J. Barden (Exors. of).	£12,545 o o
Leslie & Co.	14,358 o o	West Bros. ..	12,529 o o
H. Flint	14,283 8 2	Wallis & Sons	12,385 o o
C. Wall	14,160 o o	H. E. Phillips	11,962 o o
W. C. Snow	13,573 18 o	R. L. Tonge	11,730 o o
F. G. Minter	13,271 o o	Geo. Gates, Rochester*	10,800 o o
W. Wallis ..	13,191 o o		
Kirk & Kirk	12,736 2 o		
G.E.D. Woollard	12,570 o o		

NEWMARKET.—For building new wall round the site of Newmarket Union Workhouse, according to specifications prepared by Messrs. Holland & Sons, architects, High-street, Newmarket :—

	Brick wall.	Cement concrete wall.
A. Spink	£408 11 6	£350 o o
H. J. Linzell	343 o o	312 o o
Kerridge & Shaw	326 19 o	270 15 6
J. Cowell.....	310 o o	297 o o
H. Gray, Newmarket	*286 15 o	293 16 6
Architects' estimate ..	320 o o	280 o o

WALTON-ON-THAMES.—For the erection of stabling, &c., Crutchfield-lane, for the Urban District Council. Mr. C. J. Jenkin, C.E., architect, Council Offices, Walton-on-Thames. Quantities by architect :—

J. Lee	£2,894	R. Atkinson.....	£2,480
Newland-Higgs	2,799	Meredew & Co.	2,459
W. Greenfield	2,606	Gaze & Sons.....	2,395
Simpson & Co.	2,571	Redhill Joinery Co.	2,250
Shelbourne & Co. ..	2,563	C. Horsell, Weybridge, Surrey* ..	2,147
Hawkins & Co.	2,493		

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The Builder.

VOL. LXXXI.—No. 3766. SEPTEMBER 28, 1901.

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The Canals of Canada.

GLANCE at the map of North America will show that the region of the great lakes is singularly fitted for a system of canals. At their head and furthest from the ocean we have to realise the inland sea of Lake Superior, 601 ft. above the sea level, covering 32,000 square miles, as stormy as, and perhaps more difficult of navigation than, many so-called seas, the gathering basin, if the expression may be used, of a region rich in the supply of wood and of minerals, the working of which, in Canadian soil at least, is but in an early period of development; and of the wheat-growing areas of the North-West. In this or in any other of the great lakes there is nothing to prevent their navigation by vessels of the largest tonnage, though from December to April navigation is rendered impossible by ice. Thus the tendency of the shipowners of the lakes is to increase the size of their vessels.

If the map be again noted it will also be seen that there is a very slight separation between Lake Superior and Lake Huron, which is 581 ft. above sea level, so that, except for a short and single obstacle, these two lakes and Lake Michigan, also 581 ft. above sea level, are one for the purpose of navigation. This obstacle is the rapids at Sault Ste. Marie, partly American, partly Canadian territory. Years ago they proved a trouble to the Indians and Hudson's Bay traders, and there is still preserved on the premises of the Lake Superior Company a small and primitive lock on one of the side streams, with a rise of 9 ft., which, together with some portage, enabled the early explorers and traders to raise their canoes from Lake Huron to Lake Superior.

The first communication between the two lakes—for the so-called St. Mary's River, the channel of which, varying in width, winds picturesquely for some fifty miles to the broader waters of Huron, is but a part of the lake—was completed by the State of Michigan in 1855. This, the first artificial link in the navigation of the great lakes, was a canal 1,800 yards long, 100 ft. wide, and 12 ft. deep, with two locks, each 350 ft. in length. This was succeeded by another lock, also on the American side, the canal being lengthened and deepened. This work, which was finished in 1879, provided a lock 515 ft. long, 80 ft. wide, and 39 ft. 6 in. deep. This, the Weitzel Lock, was found insufficient, and in 1897 there was opened another and larger lock known as the Poe Lock, 800 ft. between the gates and 100 ft. in breadth. On the Canadian side a canal and lock, the latter 800 ft. long and 60 ft. in breadth, were constructed by the Government and opened for traffic in 1895. Like the American locks, this is free of toll. The Falls of St. Mary still dash in curling foam from Superior to Huron as they did when, on an early summer day in 1671, Lusson, standing among a little knot of Frenchmen in the middle of a crowd of Indians collected from the vast forest around the lakes, with picturesque symbols took possession of these regions for the Crown of France. But on either side there now passes to and fro through these great gates one of the largest ship traffics in the world. The bellow of the steam signal, the splashing of the screw constantly are heard where, even fifty years ago, the Indian's fishing-canoe was almost the only boat in these waters.

The perpetual stream of traffic increases year by year. The lake steamers are growing in size, and some are now built to carry 7,000 tons deadweight on a draught of 19 ft. The so-called "whale-back" craft, shaped like a cigar with a kind of forecastle and poop which some years ago came into vogue, are now giving way to vessels worked by their own steam, low in the waist with a high-raised forecastle and poop topped by a species of deckhouse. Practically all the traffic of the lakes passes through the locks of Sault Ste. Marie, and then expands, so to speak, some going down Lake Michigan to United States ports only, some to the American ports on Huron and Erie and Ontario, notably Cleveland and Buffalo among these, and some to Canadian destinations. The vast extent of this traffic, scarcely realised in this country, is best exemplified by the following official figures:—

Comparative statement of Lake Commerce through United States and Canadian canals at Sault Ste. Marie, Michigan, and Ontario for the seasons of 1899 and 1900.

ITEMS.	Traffic for 1900.		Total traffic for		Increase, 1900.		Decrease, 1900.	
	United States Canal.	Canadian Canal.	Season 1900.	Season 1899.	Amount.	Per C'nt.	Amount.	Per C'nt.
Vessels, passages:								
Steamers, number.....	11,805	2,621	14,426	14,378	48	0	—	—
Sails, number.....	3,701	303	4,004	4,776	—	—	772	16
Unregistered, number	863	159	1,022	1,101	—	—	79	7
Total, number	10,369	3,083	19,452	20,255	—	—	803	4
Lockages, number	8,479	2,206	10,685	10,999	—	—	314	3
Tonnage:								
Registered, net tons.....	20,136,782	2,179,052	22,315,834	21,958,347	357,487	2	—	—
Freight, net tons	23,607,354	2,035,719	25,643,073	25,255 810	387,263	2	—	—
Passengers, number.....	36,313	22,242	58,555	49,082	9,473	19	—	—
Coal:								
Hard, net tons	476,131	39,384	515,515	841.281	—	—	325,766	39
Soft, net tons.....	3,488,558	482,904	3,971,462	3,099,606	871,856	28	—	—
Flour, barrels.....	6,123,458	637,230	6,760,688	7,114,147	—	—	353.459	5
Wheat, bushels	31,325,093	9,163,009	40,489,302	58,397,335	—	—	17,908,033	31
Grain, other than wheat, bushels	15,068,245	1,106,414	16,174,659	30,000,935	—	—	13,826,276	46
Manufactured and pig iron, net tons	117,086	18,499	135,585	214 585	—	—	79,000	37
Salt, barrels	318,358	10,537	328,895	316,336	12,559	4	—	—
Copper, net tons	126,671	4,395	131,066	120,090	10,976	9	—	—
Iron ore, net tons.....	15,439,617	1,003,951	16,443,568	15,328,240	1,115,328	7	—	—
Lumber, M. ft. B. M.	898,093	11,558	909,651	1,038,057	—	—	128,406	12
Silver ore, net tons	110	—	110	487	—	—	377	77
Building stone, net tons ...	43,912	4,990	48,902	39,063	9,839	25	—	—
General merdse., net tons.,.	460,760	80,637	541,397	587,484	—	—	46,087	8

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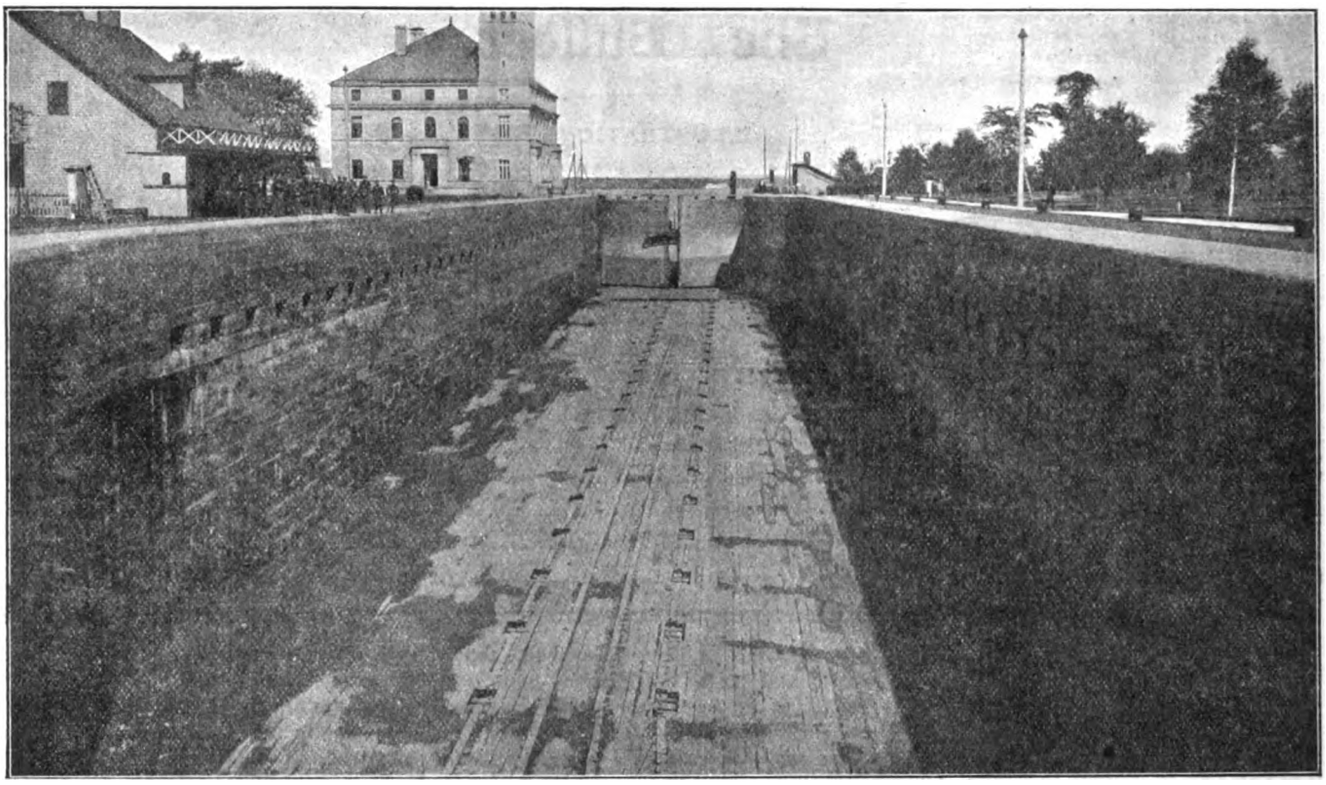

Sault-Ste-Marie: Lock Empty, showing Valves for Admission of Water.

Estimated Value of Freight passing St. Mary's Falls Canal, Michigan, and Sault Ste. Marie Canal, Ontario, for the Season of 1900.

Items.	Quantity.	Price per Unit.	Valuation.
		dols.	dols.
Coal, anthracite, net tons	515,515	5·25	2,706,454
Coal, bituminous, net tons	3,971,402	3·00	11,914,386
Flour, barrels	6,760,688	4·00	27,042,752
Wheat, bushels	40,489,302	·70	28,342,511
Grain, other than wheat, bushels	16,174,050	·87	14,071,953
Manufactured iron, net tons	115,510	100·00	11,551,000
Pig iron, net tons	20,075	17·50	351,813
Salt, barrels	328,805	1·00	328,805
Copper (refined and matte), net tons	131,066	300·00	39,319,800
Iron ore, net tons	16,443,568	3·75	61,663,380
Lumber, M. ft. B. M.	909,651	16·50	15,009,241
Silver ore, net tons	110	125·00	13,750
Building stone, net tons	48,902	12·00	586,824
General merchandise, net tons	541,397	100·00	54,139,700
Total			267,041,050·48

Average value per ton of freight for season of 1900, 10·41 dols.
Average value per ton of freight for season of 1899, 11·14 dols.

The canal which at present is of the first importance in connexion with the eastward-bound through traffic is the Welland Canal, which passes by Niagara and connects Lakes Huron and Ontario, and is the second artificial link in the navigation of the Lakes. The third and succeeding links are the canals between the Bay of the Thousand Isles, where the St. Lawrence leaves Lake Ontario and Montreal, consisting of the Williamsburg Canals, namely, Gallops, Rapide Plat, and Farrans Point, respectively eight, four, and one mile in length; the Cornwall Canal, eleven miles; the Soulange, 13½ miles; and lastly, close to Montreal, the Lachine Canal, 8½ miles long with five locks, and a total lift of 45 ft. The Welland Canal is of importance not only to Canada, but also in less degree to the United States, since Buffalo, on Lake Erie, is the port and centre of transportation for the lake trade to the United States. The Welland Canal is twenty-seven miles long with twenty-five locks, and a depth of 14 ft.; indeed, the completion of the works on the Soulange Canal, on the northern bank of the St. Lawrence above Montreal, gives a uniform depth of 14 ft. on the through canal system of Canada. To attain this end large sums have been expended by the Government, and vessels capable of carrying cargoes up to 3,000 tons will be able to pass through from any port of Lake Superior to Montreal. On the other hand, the increasing class of vessels of deeper draught, which are now so much in favour and so profitable, will not be able to ply through to Montreal, and with the present satisfactory freight rates it is certain that more and more of these vessels will be built.

There are those who think also that with a canal system capable of accommodating vessels of greater draught a communication might be established between the lakes and Europe. Large, however, as are many of the steamers now plying on the lakes, they would require to be different in build for ocean traffic, with a higher freeboard and stronger construction. Severe as are the storms and high as the seas can run on these lakes, the rolling swells of the Atlantic are unknown, and the traffic is in the summer only. But even with a 14-ft. channel some ocean steamers could trade between Europe and the lakes and carry a considerable cargo.* How substantial is the increase in cost through the present necessity of transhipment is well shown by the following figures, which, though not recent, are clear as examples:—

"Statement made by the Railroad and Warehouse Commission, showing market value of No. 1 Northern wheat at Duluth on September 4, 1899, as compared with actual sale of 8,000 bushels Duluth No. 1 Northern wheat on same day at Liverpool for delivery in London, c.i.f. (cost, freight, and insurance):—

	Cents.
September 4. Duluth quotation for No. 1 Northern	68·00
Duluth elevator and inspection charges	0·85
Lake freight and insurance, Duluth to Buffalo	4·78
Elevator charge and commission at Buffalo	1·00
Canal freight, Buffalo to New York	2·50
Elevator charged, &c., in New York, viz., demurrage, towing, transferring, and trimming	2·00
Ocean freight and insurance, New York to London	7·20
Shrinkage in weight, Duluth to London	0·50
Cost in London, c.i.f.	86·83
September 4, sold in Liverpool for London delivery, 1,000 quarters (8,000 bushels) Duluth No. 1 Northern wheat at 28s. 1½d. per quarter (480 lbs.), or 84⅜c. per bushel (say)	84·38
Difference	02·45

Showing that on that day the market in London was about 2½c. lower than that of Duluth."

A point which will be at once noted in the above statement is that the lake and canal freights are higher than the ocean freights—the freight from Duluth to New York is 7·28

* During the winter 1900-1 the Lake Superior Company despatched four steamers with cargoes of ore from Lake Superior to the Bristol Channel.

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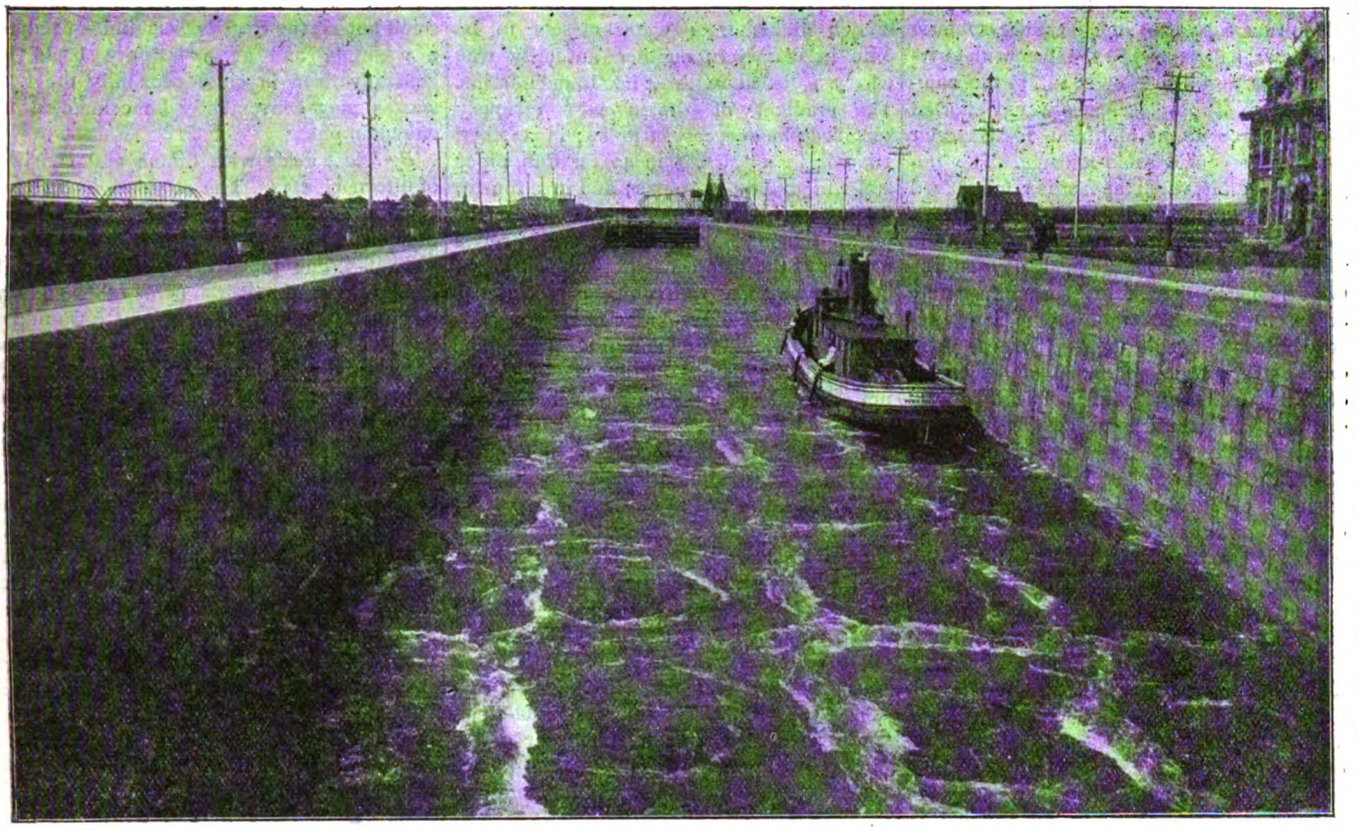
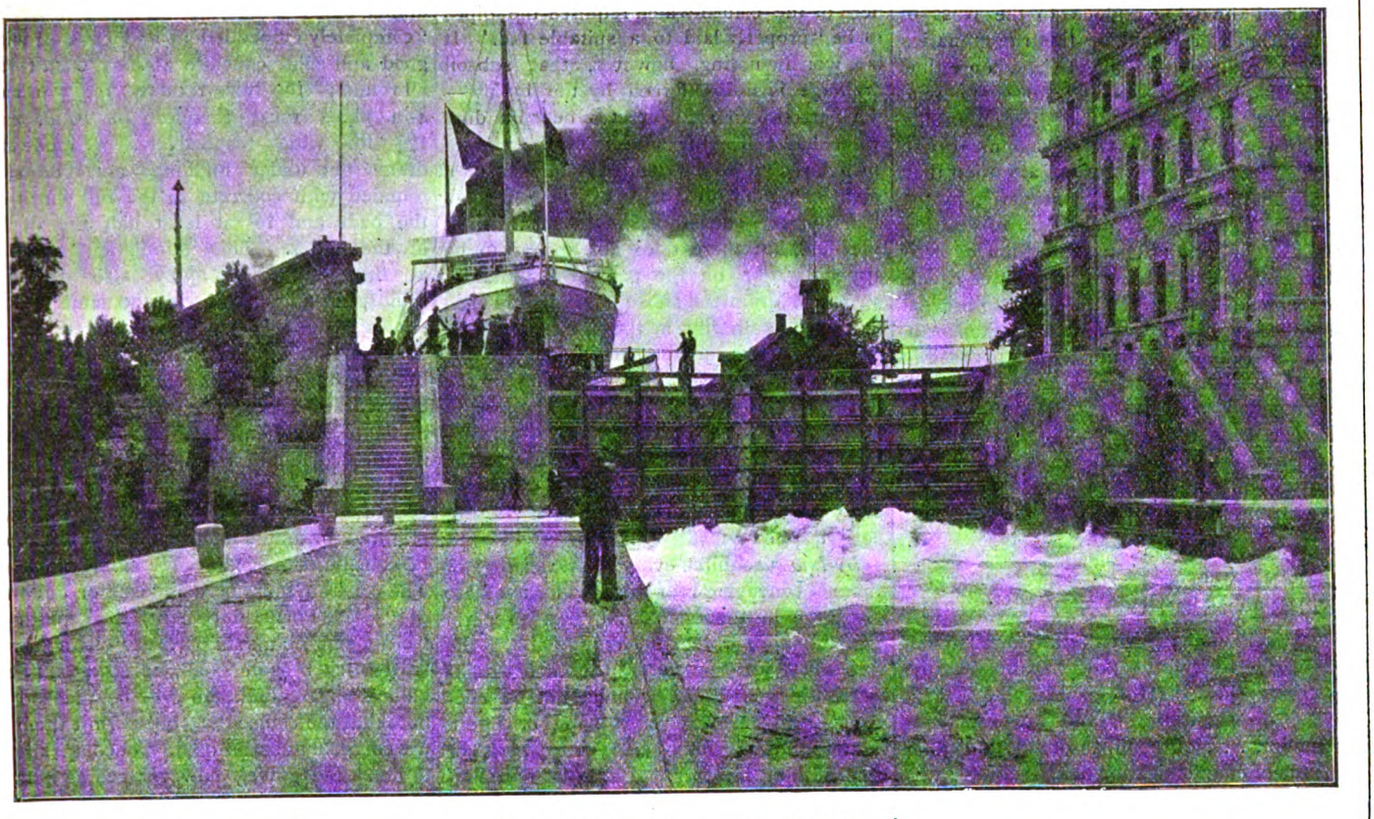


Sault-Ste-Marie: Lock in Process of Filling.



Sault-Ste-Marie: Below the Lock Gates.

against 7·20 from New York to London. The reason, no doubt, is that on the lakes the tonnage and the seasons are limited; on the Atlantic there are plenty of ships, and the traffic continues from year's end to year's end.

But when the canal system of Canada is under consideration it needs only a glance at the map to show that for the through traffic between Superior and Montreal, or one may say from Port Arthur in the west to Montreal in the east, a distance of 1,274 miles—Montreal representing the point of departure for the ocean—there are routes which might be shorter than those now existing. One of these is the Trent Canal system—to connect the eastern end of Georgian Bay with Lake Ontario—a scheme which, valuable in conception, appears to be wholly inadequate as it is being carried out. Progress in the work is slow, and even when completed the size of the canal will be such that it will be quite useless except for small traffic. There is also the proposed, but still wholly indefinite, scheme to make a connexion between Georgian Bay and Ottawa by way of French River, Lake Nipissing, and the Ottawa River, and which was recommended in the report of a Special Committee of the Canadian Senate in 1898.

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It would at Ottawa join the Rideau Canal which runs from Kingston on Lake Ontario to Ottawa, a distance of 126 miles, with forty-nine locks, and a rise of 282 ft. to the summit. Each of these schemes would shorten the distance from Montreal to Superior by a very considerable mileage. The importance of this, when the fact is remembered that the navigation of the lakes is not open for more than about seven months of the year, cannot be overrated; a day on the lakes is much more valuable than in purely ocean traffic. To those who are unacquainted with the already immense trade on the lakes the importance of the canals of Canada is naturally impossible of appreciation. But it must be clearly borne in mind that it will continue to increase. Canada has large undeveloped mineral resources; the North-West is a great field of agricultural produce. The gravitation of population to the United States instead of Canada is now less marked, and as labour becomes more obtainable in the Dominion so will development proceed, and with it there will be more traffic to be handled. Thus the importance of the canal system of Canada will be constantly increasing. From a British point of view, the value of an outlet for the wheat-growing districts of Canada through Imperial territory to a point whence grain can be shipped to the United Kingdom can hardly be overrated. In time of war, with the Atlantic patrolled by powerful cruisers, the wheatfields of the wide regions to the west of Lake Superior would be the true granaries of England. The canals of Canada are thus essential, not only as a link for commercial purposes, but also for the well-being of the mother country. Their development and perfection are more worthy of attention than fantastic plans for national granaries in the British Islands. Duplication of routes, rapidity of locking, the prevention of accidents by widening and deepening of canals and channels, are essential so as to prevent any interruption of traffic between the North-West of Canada and the ocean, because in the Canadian wheatfields there exists a certain and vast supply of grain for Great Britain in time of war so long as communication is adequate and uninterrupted in Canada, and the passage across the Atlantic is efficiently safeguarded.

THE NEW "DRAINAGE BY-LAWS" OF THE LONDON COUNTY COUNCIL.

IT is somewhat strange that, although the power of making by-laws "for regulating the dimensions, form, and mode of construction . . . of the pipes, drains, and other means of communicating with sewers" was conferred on the Metropolitan Board of Works by the Metropolis Local Management Act of 1855, neither the Metropolitan Board of Works nor its successor, the London County Council, has exercised its power directly until this year. Indirectly through the Vestries the power has been exercised, but the result has been much less satisfactory than if the central authority had undertaken the work. The by-laws of different districts varied in many important details. In one district no house-drain must be more than 6 in. in diameter; in another, the diameter of main house-drains must be *at least* 6 in. One vestry required branch-drains from water-closets to be 6 in. in diameter; another authority was wisely satisfied with 4-in. branch-drains. The gradient of drains was variously specified: in one case, 1 in 80; in another, 1 in 60; in a third, 1 in 40 for 6-in. pipes and 1 in 30 for 4-in. pipes; and in a fourth, "half-inch in each pipe," the length of the pipe not being stated. These are merely a few out of the many instances which might be given to show the confusion which has resulted from the devolution of its power by the central authority, and there cannot be two opinions as to the advantage of one uniform code of by-laws applicable to the whole of London County. Whether the by-laws which have recently been adopted by the County Council are satisfactory in themselves, remains to be seen.

The older by-laws made by the County Council under the Public Health (London) Act, 1891, to regulate the construction of water-closets, &c., remain in force, with the exception of the last clause of No. 3, which dealt with the ventilation of water-closet traps, and the whole of No. 4, which contained the regulations respecting soil-pipes. These have been repealed in favour of the altered requirements in the new Drainage By-laws. The alterations will be more particularly referred to hereafter.

By-law 1 deals with subsoil drainage. No objection can be made to the method of construction specified, except to the vagueness of the clause which requires the pipes to be "properly laid to a suitable fall." It is worth noting, however, that subsoil drainage is not enforced by the by-law—"A person who shall erect a new building *and** shall cause the subsoil of the site of such building to be drained by means of a drain communicating with any sewer," shall construct the subsoil-drains in the manner specified, but there does not appear to be any obligation on the part of a building-owner to drain the subsoil. Probably each municipal authority in the metropolis will sooner or later insist on such drainage being carried out wherever, in the opinion of the Borough Surveyor, it is necessary.

By-law 2 specifies that drains for conveying surface-water must be constructed in the same manner as sewage drains, and that every inlet to such drains must be "a properly-trapped gully."

By-law 3 requires every rainwater pipe or channel conveying roof-water to a sewer "to discharge in the open air over a properly trapped gully, or into such gully above the level of the water in the trap thereof." Rainwater pipes *or channels* must not be constructed to receive "any solid or liquid matter from any water-closet, urinal, slop or other sink or lavatory." Baths are not mentioned, and the waste water from these may therefore be conveyed into rainwater pipes or channels if desired. The reason for this exception is doubtless that bath water is, as a rule, less foul than the discharges from the fittings mentioned, but, after all, there is usually very little difference between bath water and lavatory water, and both are often less foul than rainwater draining from sooty and bird-polluted roofs. If bath-wastes may be connected with rainwater pipes, there seems to be little reason for prohibiting the connexion of lavatory wastes. On the other hand, it ought not to be forgotten that in small houses the bath is sometimes used as a washtub, and as a lavatory basin is generally fixed in close proximity the two wastes may conveniently be connected to one main pipe.

By-law 4 deals with drains and consists of fifteen clauses. The stipulations in this by-law, unless otherwise stated, refer to all drains except those for the drainage of the subsoil. The pipes must be "of glazed stoneware or of cast-iron or of other equally suitable material," and must not pass under any building except "where any other mode of construction may be impracticable." Drains must be "of adequate size," the diameter of sewage-drains to be "not less than 4 in.;" the size of drains from rainwater pipes and surface-gullies is not clearly stated, but apparently 3-in. pipes will be allowed.

Every drain must be laid on a bed of concrete "not less than 6 in. thick, and projecting on each side of the drain to an extent at east equal to the external diameter of the drain." The width of the concrete must therefore be at least 12 in. for 3-in. stoneware pipes, 15¾ in. for 4-in., 18¾ in. for 5-in., 21¾ in. for 6-in., and 31½ in. for 9-in.; the width will be slightly less for iron pipes—namely, 10⅞ in. for 3-in. pipes, 14¼ in. for 4-in., 17¼ in. for 5-in., and 20¼ in. for 6-in. This stipulation applies to all *underground* iron drains, and to stoneware drains not under buildings. In the case of stoneware drains under buildings, the pipes must be "completely embedded in and covered with good and solid concrete at least 6 in. thick all round;" the beds required for 3-in. and 4-in. pipes must therefore be 16 in. and 17¼ in. wide respectively. Stoneware drains not under buildings must be surrounded with concrete to the full width of the beds and to at least half the depth of the pipes. This stipulation appears at first sight to apply also to iron drains, but a later clause of the same by-law shows that this is not intended, as it specifies that an iron drain passing under a building must be "laid on a bed of good concrete in accordance with the requirements of this by-law relating to drains which do not pass under a building." Not a word is here said as to embedding the drain in concrete to half its depth, and if this is not required for drains under buildings, it cannot be considered necessary for external drains. The concrete must be composed of one part of "good Portland cement," two parts of "clean sand," and six parts of "clean gravel, hard brick broken small, or other suitable ballast." Jerry-builders will be pleased to note that the clause does not permit them to use concrete of better quality, or compel them to break the gravel, however coarse it may be.

Cast-iron drain-pipes may have flange-joints "securely bolted together with some suitable insertion," or socket-joints "made with molten lead properly caulked." The sockets must not be less than 2½ in. deep, and 3½ in. in diameter for 3-in. pipes, 4½ in. for 4-in, 5¾ in. for 5-in., and 6¾ in. for 6-in. The weights of cast-iron drain-pipes per 9 ft. length (including flanges or sockets and beaded spigots) must be 110 lbs. for 3-in. pipes, 160 lbs. for 4-in., 190 lbs. for 5 in., and 230 lbs. for 6 in. Such pipes may be fixed above ground in buildings, if "carried at least at each joint on adequate piers or

* The italics here and throughout this article are ours.

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other sufficient supports, constructed of iron, stone, brick, or cement concrete."

Stoneware drain-pipes must have "socket joints properly put together with cement or other equally suitable material." The kind of cement — whether Portland, Roman, Parian, Keene's or other—is not stated, but doubtless Portland cement is intended. Admixture with sand is apparently prohibited, but surely this is a mistake. The thickness of the stoneware, and the diameter and depth of the sockets are specified for the different sizes of pipes.

Every drain must be "laid with a suitable fall," but we are not informed what fall is considered suitable. Apparently this detail is left for the consideration of the various Borough Councils, on account of the different depths of the sewers in different parts of the metropolis. "Whenever practicable . . . . adequate means of access" must be provided at each end of a drain passing "beneath" a building; this is doubtless intended to apply also to an iron drain carried on supports within a building. Drains passing "beneath a wall" must be protected from injury (which might be caused by the settlement of the wall) "by means of an arch, flagstone, or iron support, which shall not bear on the drain."

Every inlet to a drain, except those provided for ventilation, must have "an efficient trap . . . capable of maintaining a sufficient water-seal," but bell-traps, dip-traps, and D-traps are prohibited.

Every drain, except a subsoil drain, must be "so constructed as to be water-tight, and to be capable of resisting a pressure of at least 2 ft. head of water." This clause is a most important one, and has already been interpreted in different ways. It does not appear to us to be intended to throw upon the builder or building owner the *onus* of applying the water-test, but merely to give the municipal officers power to apply it if they desire to do so. If the intention had been to render the water-test obligatory on the builder, the wording would surely have been on the lines of the other clauses in the by-laws, and would have read as follows:—"And *shall cause such drain to be tested with* a pressure of at least 2 ft. head of water."

By-law 5 specifies that every drain must be trapped at a point "as near as may be practicable" to its junction with the sewer. "Adequate means of access to such trap" must be provided. This may take the form of "a separate manhole or other separate means of access." The meaning intended to be conveyed by the use of the word "separate" is not obvious. It surely cannot mean that the manhole may not also be used as an inspection-chamber for the drains or as a junction-chamber for branch drains.

By-law 6 requires manholes and other means of access to be "water-tight up to the level of the adjoining ground-surface or roadway," and to be fitted with suitable covers, those within buildings to be air-tight.

By-law 7 prohibits right-angled junctions (both vertical and horizontal) in drains.

By-law 8 deals with the ventilation of drains, and specifies three methods which may be adopted, namely, (1) a low-level inlet near the intercepting trap, and an outlet pipe or shaft "as far distant as may be practicable," (2) a low-level inlet near the head of the drain, and an outlet shaft "as near as may be practicable to the trap," and (3) two "suitable vertical pipes or shafts" carried up "to such heights and in such positions that when either acts as an inlet the other may be a safe outlet for foul air." Each opening is to be fitted with a grating, the apertures in which must not be less than the sectional area of the pipe or shaft Bends must not be formed in any ventilating pipe or shaft, "except where unavoidable." Soil-pipes and waste-pipes from slop-sinks may be used as ventilating-pipes for drains not more than 4 in. in diameter, if the pipes are not less than 3½ in. in diameter, and are otherwise satisfactory "as to the position, height and mode of construction"; special ventilating-pipes must, however, be not less than 4 in. in diameter, and must be constructed in all other respects as soil-pipes.

By-law 9 prohibits drain-inlets within buildings, except from water-closets, slop-sinks, and urinals.

By-law 10 specifies that every waste-pipe from a lavatory and sink (other than slop-sinks) must be trapped immediately beneath the fitting by "an efficient siphon-trap," the traps and pipes to be of "lead, iron, or stoneware." Neither the diameters nor weights are stated. Copper, brass, and white metal are not mentioned, but surely this is an oversight. Bell-traps, dip-traps, and D-traps are expressly prohibited, and every siphon-trap must have "adequate means for inspection and cleansing," and be ventilated into the external air whenever this is "necessary to preserve the seal of such trap." Baths are not included in the foregoing provisions, and the waste-pipes may, apparently, be of any material and untrapped.

"*Every*" waste-pipe, however, must discharge in the open air over or into a trapped gully or over a channel leading to such a gully.

By-law 11 contains some of the new regulations regarding soil-pipes. The absolute prohibition of internal soil-pipes in new buildings is now withdrawn, but such pipes must be of drawn lead (*not* cast-iron), and will only be allowed when it is not "practicable" to fix the pipe outside. No alteration has been made in the *weights* of lead and iron soil-pipes, but the *minimum* thickness of iron is now specified, namely, ^{3} in. for 3¼-in. and 4-in. pipes, and ¼ in. for 5-in. and 6-in. pipes. This alteration has probably been made so that irregular castings can be rejected. Iron pipes may have flange joints "securely bolted together with some suitable insertion," or socket joints "made with molten lead properly caulked." *Internal* lead soil-pipes must have "proper wiped plumbers' joints"; the joints for *external* lead soil-pipes are not specified. The waste pipes from slop-sinks may be connected to soil-pipes, but rainwater pipes and the wastes from other sinks and baths must not be so connected. There is no prohibition in this clause against the connexion of lavatory waste-pipes to soil-pipes, but this is doubtless an oversight. The trapping of a soil-pipe at the foot is still expressly prohibited, but the unnecessary provision about carrying the soil-pipe above the highest point of the roof, and 3 ft. above any window within 20 ft. of the open end of the pipe, has been omitted.

By-laws 12 *to* 16 deal with the joints from lead to iron, stoneware to lead, lead to stoneware, iron to stoneware, and stoneware to iron. In the old by-laws only three of these joints were specified, namely, lead to iron, stoneware to lead, and stoneware to iron; in these cases the same type is specified in the new by-laws as in the old. The lead to stoneware joint may be made by means of "a flanged thimble of copper, brass, or other suitable alloy" connected to the lead pipe by "a wiped or overcast metallic joint," the flanged end of the thimble to be inserted into the stoneware socket and the joint made with Portland cement. The iron to stoneware joint may be made by placing the beaded spigot of the iron into the stoneware socket, and filling the annular space with Portland cement. In every case, however, alternative methods may be adopted if "equally suitable and efficient." This may lead to different methods being practised in different boroughs, but has the advantage of allowing new inventions to be adopted. An important innovation is that, whereas in the old by-laws the specified joints were only applicable to connexions with soil-pipes, they are now enforced for connexions with soil-pipes, ventilating-pipes, and waste-pipes.

By-law 17 takes the place of the last clause of the old By-law 3, and specifies that, where two or more water-closets are connected to one soil-pipe, the trap of each must be "ventilated into the open air at a point as high as the top of the soil-pipe, or into the soil-pipe above the highest water-closet." The ventilating-pipe must have an internal diameter of not less than 2 in., and must be connected to the trap in the manner specified in the old by-law. The new matter states that trap ventilating-pipes must be of drawn lead if fixed inside the building, or of drawn lead or cast-iron if fixed outside the building. The weights of the pipes are stated in addition to other details.

By-law 18 deals with slop-sinks and urinals, the two kinds of fittings being treated exactly alike. Every fitting must have "an efficient siphon trap," which must be ventilated where necessary after the manner prescribed for a water-closet trap. It is not clearly stated that, if a water-closet and slop-sink are connected to one soil-pipe, the traps of the two fittings must be ventilated, although trap ventilation is then more necessary than in the case of two water-closets. The waste-pipes from slop-sinks and urinals must be constructed as soil-pipes, but the internal diameter may be 3 in. instead of 3½ in. The weights must be as follows:—Lead, 60 lbs. per 10 ft. length; cast iron, 40 lbs. per 6 ft. length. The provision of a 3-in. waste-pipe for a single urinal is both extravagant and insanitary; how can it possibly be kept clean by the one-gallon flush commonly allowed?

By-law 19 throws upon the *owner* of a building the duty of maintaining "in a proper state of repair all pipes, drains, and other means of communicating with sewers, and the traps and apparatus connected therewith."

By-law 20 prescribes the penalties for offences "against any of the foregoing by-laws."

By-law 21 specifies that "these by-laws shall, *as far as practicable*, apply to any person who shall construct or reconstruct any pipe or drain or other means of communi-

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cating with sewers, or any trap or apparatus connected therewith, *so far as he shall effect any such works* in any building erected before the confirmation of these by-laws, as if the same were being constructed in a building newly erected." A certain amount of latitude is allowed by the phrase "so far as practicable" and no fault need be found with this; the words "so far as he shall effect any such works" appear to have been inserted for the purpose of narrowing the scope of the by-law, but their exact meaning is not by any means clear. If, for example, a person wishes to ventilate the traps of two water-closets served by one soil-pipe, does the by-law compel him to reconstruct the soil-pipe, or does it merely compel him to construct the trap-ventilation pipes in the specified manner? We believe that the by-law involves only the latter and not the former, but the final interpretation will probably have to be given in the law-courts.

By-law 22 defines the word "person" to include "any body of persons, whether corporate or unincorporate," and *By-law* 23 declares that the by-laws "shall not extend to the City of London."

It is obvious from this cursory review of the by-laws that they are not by any means perfect. There are sins of omission and of commission, and the meaning is not everywhere clear. Some of the requirements are unnecessarily onerous, but in the main the by-laws are a fair compromise between jerry-work and extravagance. In some cases the provisions are less stringent than those in the former by-laws, and an amount of latitude is allowed which cannot in the end fail to be advantageous, although at first it may lead to friction.

NOTES.

The Liverpool Cathedral.

IT is evident that there is to be a new competition for the Liverpool Cathedral, which we think is rather unjustly throwing over Mr. Emerson, whose design was practically selected in the former competition. It is true that a new design must in any case be made, the selected site being entirely different in its nature and surroundings from the originally proposed one. This however is no doubt a question on which there may be difference of opinion; the new committee is not in any direct way ound by the action of the old one. But what we do regret to see is the foolish mischievous resolution that "the style of the new cathedral should be Gothic." Here is the ecclesiological prejudice in church architecture in full blow again; a great chance for the production of a grand and original piece of modern church architecture is deliberately thrown away, and we shall have another specimen of imitation mediævalism. Not only is the Gothic style unsuitable for a modern cathedral; the fatuity resides in demanding a special "style" at all. Architects should be invited to design a cathedral, simply, and be left to consult their own genius as to its treatment. A committee who could make a formal demand for a "Gothic" cathedral must be entirely behind the age in their ideas, and entirely ignorant of the spirit and tendency of the best modern thought in architecture. By making such a demand they have practically thrown away a great opportunity.

The Lightning Conductors at Westminster Abbey.

MR. KILLINGWORTH HEDGES is to be congratulated on the system of lightning conductors which now protect Westminster Abbey. In protecting a building of national importance, it is very difficult to decide how far we should cover it with a network of wires. Mr. Hedges seems to have fixed upon a happy mean; there are sufficient conductors to make the main buildings of the Abbey almost absolutely safe, and yet they are very unobtrusive. He uses $\frac{3}{8}$ in. seven-strand copper cables, which are carried horizontally along the apex of the roof of the nave and transepts and also over Henry VII.'s Chapel. The towers, lantern, and other higher parts are protected by similar conductors, which are joined on to the main cables. Along the horizontal conductors are fixed thirty four-point aigrettes, fastened to the cables by substantial joint boxes, which are filled up with solder, and ought therefore to last as long as the cable. The pinnacles all round the roof are each protected by $\frac{1}{4}$-in. solid copper wire, and so it will be seen that the system is fairly elaborate. We are glad that there are no absurd tall spear points sticking up all over the roof; in our opinion Mr. Hedges' arrangements are quite as efficient. We do not quite understand why Mr. Hedges keeps the vertical conductors 6 in. from the walls by means of special holdfasts. Surely there is nothing inside the building to which the lightning might possibly side flash. The earthing arrangements are very complete, a small pipe being laid from the nearest rain-water pipe to the coke surrounding the earth plate. The conductor will, therefore, nearly always show a very low earth resistance. Whilst we admit the importance of periodically testing the earth resistance of lightning conductors, we are not prepared to insist on the necessity of a very low earth resistance. We had occasion recently to test the earth resistance of four lightning conductors which varied from one-tenth of an ohm to 160 ohms. Thinking that possibly the high resistance of one of them was due to a break in the cable, we had it dug up. It was found that there was no earthplate at all, simply a few bricks and a little blackish earth, which probably was once a few pieces of coke. Yet this lightning conductor, which was a copper rope half an inch in diameter, had protected a very lofty chimney shaft for over twenty years.

The Proposed Draining of the Zuyder Zee.

THE withdrawal is announced from The Hague, by the newly-formed Dutch Cabinet, of the Bill for the draining of the Zuyder Zee. The Bill had been introduced in the Second Chamber of the States-General by Mr. Lely, Minister for the Waterstaat. Mr. Lely's scheme contemplated the enclosure and the gradual reclamation in part of the Zuyder Zee. He proposed to begin the work with a dam—having sluices opening into the North Sea—from Piaam, in Friesland, to Wieringen, in North Holland. He intended then to reclaim two areas of dry land, or polders: the one, the Wieringen Polder, to extend over a total area of 21,700 hectares, including 18,700 hectares of fertile land; and the other, the Hoorn Polder, to extend over a total area of 31,520 hectares, including 27,820 hectares of fertile land. The two polders would lie between Medemblik and Wieringen, and Marken and Hoorn, respectively. It was estimated that the works would be accomplished in eighteen years hence at a computed cost of 95,000,000 florins, or 7,916,667*l*. Tho two polders we mention are plotted on the west side of the Zuyder Zee and represent but a portion of its aggregate extent.

Rural Drainage.

THE correspondence on the subject of rural drainage which has been going on for some weeks in the *Times* reveals an unsatisfactory state of things. The extracts, however, from the Reports of the Inspectors of the Local Government Board, which we have published year by year, might well have prepared our readers for this. But it is useless to discuss emendations in the Public Health Act. What is chiefly needed is that the existing law should be strictly enforced, and more especially that the water supply should be kept free from contamination. Parish Councils have power over the water supply of villages, but, speaking generally, they have taken no steps whatever to safeguard the purity of the water of English villages. If every cottage had an earth closet there would be no sanitary difficulties, and even if other systems were properly managed sanitary matters in the English villages would be greatly improved. The local Inspectors are averse to minute supervision, and as a rule, unless their attention is called to some nuisance by an individual or by the outbreak of some disease, they take no steps to keep occupiers up to the mark. In the rural districts in sanitary matters the door is being constantly locked after the horse is stolen. A polluted water supply causes an attack of diphtheria, the local Inspector pronounces a well to be polluted, and an order is made for it to be closed. If such well had been inspected and closed at an early period in the course of a systematic survey of the district, there would have been no outbreak of disease. Common sense and care are the chief needs of English rural drainage. The rural population is decreasing, so that there is not the need for new systems of drainage which are necessitated by the growth of urban districts.

New York Central Railroad Tunnel.

A REPORT has now been made by a grand jury appointed to consider the case of the two-mile tunnel through which the New York Central Railroad approaches its terminal station. The jury recommended that the wall dividing the two outer tunnels from the centre tunnel be removed; that passenger coaches be protected from the sun when not in use; and that some other motive power than steam locomotives be used through the tunnel. We know something of unpleasant conditions in railway tunnels in this country, thanks to the existence of the Metropolitan and Metropolitan District Railway Companies; but even these awful examples serve but inadequately to convey a true idea of the discomfort experienced by passengers in the more trying climate of New York. In other respects public feeling with regard to the Central tunnel in that city very much resembles the ordinary state of opinion in London as to similar conduits. There is, we learn, an "outburst of indignation against a railroad company of which the public has been such a liberal patron,"

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and the company is accused of showing not the slightest indication of any solicitude for the comfort of the travelling public. No effort seems to be made to store the carriages in sheds where they could be kept moderately cool, ventilation of the tunnel is conspicuously absent, and the officials, having "expended unlimited time and thought" upon the problem, regret to find that all alternative methods of traction present insuperable difficulties. Up to the present time the Central Railroad has enjoyed something very like a monopoly so far as a certain portion of the traffic is concerned, but the completion of the Rapid Transit tunnel, the construction of the Hudson River bridge, and the introduction of competing roads into Manhattan Island, will no doubt materially affect the position. Then the offending company will speedily discover—as our own sinning companies did—that electric traction is not entirely a philosophical abstraction. Railway companies very frequently resist all reforms that are not dictated by diminishing dividends. This has certainly been the case with our own Metropolitan companies, and the public is now rejoicing to think that the chastening influences of adversity have not been exercised altogether in vain. But our friends in New York have not yet the same reason for self-congratulation.

Trolley Wire Dangers.

THE paper read by Professor Jamieson to the Electrical Section of the Engineering Conference at Glasgow on the dangers arising from trolley wires was a most instructive one. Recent accidents prove that so long as telephone, telegraph, and electric light wires are permitted to pass over the trolley wire, no matter how complicated the system of guard wires adopted may be, there is always the risk of a broken wire making contact between a person or animal and the trolley wire. It seems, therefore, that all message or lighting wires must be placed underground. Doing this would at once dispense with the necessity of guard wires, which are in themselves a source of danger and frequently cause a breakdown of the system by earthing the trolley wire. Sometimes the current carried by the broken guard wire is not sufficient to interrupt the system, and so the hanging wire becomes white hot. Professor Jamieson makes the useful suggestion that an earthing switch ought to be placed on every car, so that in the event of a wire falling over the trolley the driver could, by turning this switch, at once cause the magnetic cut-out of the feeder of that section of the live wire to act, and hence the pressure would be cut off. We understand that this device has been successfully tried at Leeds. It seems to us much the safest and simplest method of procedure in an emergency. We have no faith whatever in india-rubber gloves which are so much in evidence in the rules of traction and lighting stations. We have tested several of these gloves at pressures easily obtainable in the laboratory, and none of the English-made gloves survived the test. The mechanical strength of the gloves also was very deficient, they could easily be perforated or torn mechanically. Hence, we wonder at the confidence that electricians have in them. Earthing the trolley-wire by means of a switch, however, would be a perfectly safe operation, and it seems to us that on a dark night this is the only thing that even the most skilful electrician could do without running grave risks.

The Electric Corrosion of Gas-Pipes.

THE paper which Dr. Leybold, of Hamburg, read at the Glasgow International Engineering Congress, on the "Destruction of Gas-Pipes by means of Electricity," treats of a subject of the greatest importance at the present time. In this country electric traction on the overhead system is being rapidly extended in all directions, and it is well known that large leakage currents from the rails often come back to the station by the gas and water mains. We have very little practical knowledge as to the amount of damage which is being done by these currents, and hence a paper on this point full of practical data will be welcomed by both electrical and gas engineers. An escape of gas in a street of Hamburg was traced to holes eaten away in a wrought-iron gas-pipe which crossed the street at right angles to the tram rails. When the pipe was taken out it was found that there was a hole eaten away directly underneath each of the four tram rails, and nearly all the pipes in the street were similarly damaged. These holes were obviously due to electrolysis. In the cast-iron water-pipes which were laid deeper down no corrosion was detected. The tramway authorities at Hamburg had been in the habit in winter-time of melting the snow on the rails with salt or with waste nitrate of soda. When the ground was soft it got saturated with a saline solution, and any pipes embedded in it got rapidly corroded by electrolysis. To protect some 1-in. gas-pipes they were covered in canvas soaked in boiled tar. On removing lengths of the pipes, however, and unwrapping the covering, it was found that they were corroded, the corrosion taking a spiral form coinciding with the wrapping of the canvas. The author stated that it was highly probable that leakage electric currents in private houses sometimes destroyed pipes embedded in the walls. A clear example of this had recently come to his notice. Knowing as we do the large leakage currents taking place from some of the mains of direct current supply systems, it is of the greatest importance to watch for signs of electrolytic action. In the subsequent discussion Mr. Gisbert Kapp, the eminent German electrician, stated that the Board of Trade "seven volt" rule for preventing damage being done by leakage currents was altogether inadequate. There is no scientific reason for selecting seven volts as the maximum permissible pressure between the rails and the water-pipes. At Hamburg the electricians have reduced the maximum pressure of the rails to much less than this.

The Borough Market.

THE Borough Market Trustees have agreed to effect an absolute transfer to the Southwark Borough Council of all their interest in the market and its profits. But inasmuch as St. Saviour's parish derives from the market rents a sum of 5,000*l.*, which is applied in relief of the parochial rates, the trustees are of opinion that the Borough Council should fully compensate the parishioners for the loss which they will suffer through the transfer. The Borough Market, for fruit and vegetables, is one of the oldest in London. It represents a street traffic that was carried on in very early times on London Bridge. After a clearance that had been made in 1290 of the stalls in the roadway of the bridge the business of the market was removed to within the precincts of (old) St. Thomas's Hospital, also to St. Margaret's Church-gate, and subsequently to the main street, there known as "Long Southwark," between the church and the end of the bridge. The Local Authorities suppressed the traffic under powers of an Act they had obtained in 1756; but it was revived by a later enactment in the "Triangle," the former site of Grimes Croft, which William, second Earl Warren, had bestowed upon the monks of Rochester Cathedral, and of Rochester House pulled down in 1604. For some new market buildings, designed by Henry and E. Rose (1851), was demolished the St. Saviour's Grammar School as rebuilt, after the fire of May, 1676, on the site of the prior's house next, south, to St. Mary Overie's. In 1885 plans were prepared by Mr. McIntyre North for a further enlargement of the market by taking in additional ground between Borough High-street and Messrs. Barclay & Perkins's brewery in Park-street, at a cost of about 65,000*l.* Six years ago Mr. A. T. Walmisley was appointed engineer for the construction of a new roof and other works, and Messrs. H. Jarvis & Son made plans for some new covered stands and the flower market.

The Howard de Walden Estate, St. Marylebone.

A PETITION addressed to the London County Council is being prepared by owners and occupiers in St. John's Wood against a contemplated interference with the residential amenities of that quarter of the town. It appears that Lord Howard de Walden, as possessor of what until lately had been the Duke of Portland's estate, is carrying out some extensive alterations and rebuilding in the Portland Town district, to extend over an area of about twenty acres. For rehousing the dispossessed tenants the managers of the estate seek to acquire a site (recently cleared) on the west side of Grove End-road, St. John's Wood. The petitioners represent that the building of model dwellings on that site will seriously affect their enjoyment of a locality which already within the last few years has suffered much through encroachments upon its garden spaces. Moreover, Lord Howard de Walden proposes, as part of his scheme for improving the Portland Town area, to advance the building-line on the front gardens in Park-road to a distance ranging from 10 ft. to 26 ft. The effect of that encroachment upon the roadway which passes along the north-western limits of Regent's Park may be best estimated from what our readers have witnessed during some while past in Euston and Marylebone roads, where what was originally designed to be a broad avenue or boulevard in the former New-road has been gradually destroyed by the erection of buildings upon the forecourts and similar front spaces.

THE STRAND IMPROVEMENT. — Mr. Daniel Watney has published his award arising out of the claim brought by Mr. Davison, silversmith and pawnbroker, against the London County Council for compensation in respect of Nos. 264 and 318, Strand, which were compulsorily acquired for the purpose of the Strand Improvement. The experts' valuations on both sides ranged from 8,103*l.* to 27,876*l.* Mr. Watney's award is 16,317*l.*

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FURTHER NOTES ON THE BRITISH ASSOCIATION MEETING.

"EDUCATION" has been the subject of a newly-created section of the Association, concerning which it is not quite clear how it comes properly under the category of subjects of an Association professedly formed for "the advancement of science." It rather reminds one of the class of subjects which used to be taken up by the now extinct Social Science Association. Professor Armstrong, who read a paper on "The Future Work of the Section," seemed to tacitly admit that there was no such thing, at present, as a science of education, as he said that "it would be the function of the section gradually to shape a science of education." The superiority of German to English education lay, he said, in the thoroughness with which the work in schools was done, and in the fact that the Germans had made research the corner-stone of their educational system; in other words, that the Germans give more place to science in their educational system than we do; but that is not to say that they have made a science of education, and we fail to see how there can be any such science in the proper and usually accepted meaning of the term. The field which the British Association has to endeavour to cover at its annual meetings, in regard to the subjects which are properly and by universal consent classified as science, is already so immense that it seems unwise to further extend and complicate its programmes by the inclusion of subjects which can only by a stretch of language be said to be scientific. The proper object of the British Association is the study of nature and natural law. We observe also that in the course of the discussion which followed Professor Armstrong's paper all the remarks turned on the methods of teaching science and the inadequate position which science occupied in our educational system. Much of that is perfectly true; only that is not the science of education, but education in science. If there is to be a science of education, it must be concerned with education generally, not education in science alone. In brief, we think the section is a mistake, and that it is wasting some of the power of the British Association by taking on a subject not strictly within its borders.

The subject of the teaching of mathematics occupied more usefully part of the time of the mathematical sub-section of section A. Professor Perry started the discussion in a paper the main point of which was to consider the true use of mathematics as a part of general education. It was usefulness, he said, which must determine what subjects ought to be taught to children and in what ways.

"The obvious forms of usefulness in the study of mathematics were:—(1) In producing the higher emotions and giving mental pleasure hitherto neglected in teaching almost all boys. (2) In brain development (*a*) in mere mathematical study, (*b*) in the aid given by mathematical weapons in the study of physical science, hitherto neglected in teaching almost all boys. (3) In passing examinations—the only form that had not been neglected; the only form really recognised by teachers. (4) In giving men mental tools as easy to use as their legs or arms; enabling them to go on with their education (development of their souls and brains) throughout their lives, utilising for that purpose all their experience. That was exactly analogous with the power to educate oneself through fondness for reading. (5) Perhaps included in (4); in teaching a man the importance of thinking out things for himself and so delivering him from the present dreadful yoke of authority, and so convincing him that whether he obeyed or commanded others he was one of the highest of beings. (6) In making men in any profession of applied science feel that they knew the principles on which it was founded and according to which it was being developed. (7) In giving to acute philosophical minds a logical counsel of perfection altogether charming and satisfying, and so preventing their attempting to develop any philosophical subject from the purely abstract point of view, because the absurdity of such an attempt had become obvious."

He objected to the teaching of elementary mathematics as if all boys were going to be pure mathematicians. He would teach mathematics in quite a different way to different students. In short, the Professor evidently leans towards the use of practical applied mathematics in schools, up to a certain point and for the majority of students. "Mathematics was a powerful weapon with which to unlock the mysteries of nature. If a man" (the average man, we presume) "knew how to use the weapon that was enough. Let him leave to others, the men who delighted in that, the forging of the weapon, the complete study of it." This is only a fresh expression of a feeling which is becoming increasingly prominent at present. There are engineers who hold that, in regard to their studies, mathematics should be gone into just as far as the study bears on the practical problems of their profession, and be taught in direct relationship to, even to some extent by means of, those practical problems. The further discussion naturally introduced the subject of Euclid, who is being somewhat shaken in his seat in connexion with modern education. But we are not sure that some of the arguments used do not cut both ways. Professor Forsyth complained of Professor Perry making usefulness the sole test of the value of a study; subjects progressed not on the line of direct usefulness. Major MacMahon, the President of Section A, followed in the same strain, observing that Professor Perry seemed to look upon every boy as if he were to be an engineer. If they were asked to give up Euclid they must have something to take the place of Euclid, and no substitute for it had been found. "Euclid," he observed (and we entirely agree with him) "was mainly an instrument for the cultivation of the mind, and only secondarily a means of impressing geometrical facts upon students." But he thought it should be taught in connexion with geometrical drawing. Professor Miall, who said he was not a mathematician, but could discuss the subject from the point of view of human nature, thought that if the intellectual needs of the people had been considered in the past, such a book as Euclid's elements would never have been put into the hands of schoolboys. "It was contrary to human nature to put a highly developed technical and artificial system of geometry, complete in all its forms, before a schoolboy and expect him to understand it. The method adopted in teaching should be that by which intellectual activity could produce its own results. It should be exploratory. It should begin with the concrete and put questions on observed facts. Thus was obtained a constructive geometry which every one built up for himself." And as to the question what was to be put in the place of Euclid, it might be observed that in Continental countries they had no Euclid, and had erected nothing in its place. Professor Minchin, following, thought that no satisfactory progress would be made in the teaching of mathematics in this country until Euclid was given up. The stumbling-blocks were the headmasters of the public schools, who would have Euclid. Those who taught mathematics had not yet realised the enormous value of graphical methods.

The point of the whole discussion is really whether mathematics is to be regarded as a mental training or as a means to a practical end. Surely the former is the higher view, and the one most consistent with the broadest interpretation of the word "education." The headmasters of public schools, who came in for Professor Minchin's sneer, are not concerned in teaching boys to be engineers, but in giving them a general education. In this sense the study of Euclid is a fine source of mental training; and we can testify that there are schoolboys, not specially brilliant ones either, who really enjoy the study of Euclid. Sir John Gorst, who occupied the chair and summed up the discussion, charged on the "practical usefulness" side, but appears to us to have unconsciously advanced what was really an argument on the other side. He said he had attempted to teach mathematics to Maori boys and men in New Zealand; he proceeded on the embryo Sonnenschein system, and found that the Maoris learned the practical arithmetic useful to them in active life faster than boys or men in this country would generally learn it, but when he attempted to teach them geometry after the Euclid fashion, it was an absolute failure; not one of them could grasp or understand the simplest proposition of Euclid. Naturally so. These Maoris were, if not savages, only just emerging from the state of savage life; and it is the characteristic of the savage mind as distinguished from the civilised, that it can only take in what presents itself as a concrete and practical object. Are we to reduce the system of teaching in our schools to the level of what can be taken in by the barbarian mind? The object of teaching the Maoris, and the only object, evidently, which they could understand, was to give them what is called useful knowledge. The object of general education for a cultured people is not merely "useful knowledge," but the development and training of the intellectual powers as an end in itself; and in that respect we think Euclid will still maintain his place. The general tone of the discussion of the subject at the Association we should call sadly utilitarian, and recommending a view of education which tends to narrow rather than to develop the intellect.

The Geology and Chemistry Sections were not for the most part occupied on any subjects having a bearing on those in which our readers are concerned. In the Chemistry Section a paper was read by Mr. Beilby on "The Minute Structure of Metals," but we have seen no report of it beyond the title. In the Geology Section Dr. R. Logan Jack read a paper on "Artesian Water Supply in Queensland." The western area of Queensland, like other portions of the Australian continent, offers a vast area of land fit in itself for cultivation, but deficient in rainfall and in surface water.

"* In 1881 he suspected that the cretaceous rocks of the Western Downs afforded conditions favourable for the discovery of artesian water, and in 1885 he, as Government geologist, with Mr. J. B. Henderson, hydraulic engineer, made a study of the area, and an experimental bore was put down which proved a success. From Mr. Henderson's annual report for 1899-1900 it appeared that up to June, 1900, 185 miles of boring had been made in search of artesian water in the district, and a large proportion of the bores had been successful; and though the artesian water did not fully compensate for the lack of rain, still the bores had already produced an important change in the conditions of life in the interior. The greater part of the western interior of Queensland was composed of soft strata of lower cretaceous age, consisting of clay-shales, limestones, and sandstones. Along the eastern margin of the cretaceous area there was a porous sandstone of great thickness, the 'Blythesdale Braystone,' and owing to low dip the outcrop of this permeable stratum occupied a belt from five to twenty-five miles wide; but the Braystone finally disappeared beneath the argillaceous and calcareous upper members of the series forming the surface of the downs to the west. Several rivers disappeared while crossing the outcrop of the Braystone, and the water must be carried in it beneath the clay-shales of the downs. Dr. Jack gave an estimate of the water which should penetrate the Braystone, and suggested the probability that much of it finds an outlet under the sea in the great Australian Bight and the Gulf of Carpentaria. He further observed that the artesian water basins were, in fact, broken basins, the break giving rise to leakage either on land or beneath the sea. In places, therefore, the water rose in a bore, but did not reach the surface owing to the site of the bore being higher than the head of pressure. This was termed 'sub-artesian water,' and illustrations were given of both artesian and sub-artesian water in the district in question."

In the Mathematical and Physical Science Section Dr. Glazebrook read a paper on the new National Physical Laboratory in course of erection at Bushey, of which he is superintendent, and about which we gave some brief particulars in our last issue. He exhibited the plans of the building, and gave the following description of its construction and arrangement:—

"The main building consisted of a substantial central block about 70 ft. square, standing on a vaulted basement. At each corner there was a large wing practically single-storied; the rooms in these were being fitted up for various special purposes. In the central building itself would be two general laboratories. There would be a large entrance hall, arranged as an apparatus-room, and a library. The basement contained six rooms of fair size; the floor had been covered with a thick layer of concrete. The walls were very thick, so that they were extremely steady, and the temperature and conditions all favourable for steady work. In addition there were other smaller rooms on the basement; two of these were entirely surrounded by thick interior walls, and arrangements would be fitted to maintain a steady temperature throughout the year. At the back was another wing containing a number of rooms suited for special researches, and there a lift had been fitted, and also a mercury column having a height of about 50 ft. For the more delicate physical work the ground floor and basement of the old house afforded ample accommodation. For the engineering work a room, 80 ft. by 50 ft., had been built, lighted from the north by a weaving shed roof. It was divided longitudinally into two bays by a series of rolled steel pillars. The one bay would contain a light travelling crane; along the other ran a line of shafting for driving the machinery and for experimental purposes. Adjoining this laboratory was a drawing office, while the engine-house and boiler-rooms were close at hand. Power, obtained from a 60-kilowatt Parsons turbine, would be distributed electrically to various

* We quote, as before, from the *résumé* published in the *Times*.

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parts of the laboratories; this form of engine was chosen for the express purpose of avoiding vibration as far as possible. The necessary tools were on order and in course of installation. The work which the committee hoped to attack in the first instance was that which had already been under the consideration of the Alloys Research Committee of the Mechanical Engineers. Apparatus for the photo-micrographic examination of steel rails was being set up, and machines for testing the elastic properties of alloys were in course of construction. Pressure gauges and steam indicators would also be tested. The height of the building would not allow the mercury column, now being erected, to measure more than 200 lbs. to the square inch, but apparatus was being constructed for pressures in excess of that amount. Considerable attention was to be given to high temperature thermometry, the testing of platinum thermometers, and the measurement of electrical quantities. Before the end of the year the committee hoped the laboratory would be fully and usefully occupied."

In the Physical Section a report was presented by Professor Everett on the subject of the rate of increase of temperature at distances below the surface in various localities. The results stated are somewhat surprising in regard to the variability of the rate of increase of temperature. Mr. Alfred C. Lane, the Michigan State Geologist, in the absence of more precise information, estimated the mean annual temperature for the district in question at 38·6 deg., and the mean temperature at the depth of no variation at 40 deg. Fahr. If we took this latter as the temperature at 50 ft. and compared it with the temperature 84 deg. at 4,450 ft. (the admitted temperature at that depth), we had an increase of 44 deg. Fahr. in 4,400 ft., or 1 deg. in 100 ft. Mr. Lane's estimate for the Calumet district, where these mines were situated, was 1 deg. Fahr. in 107 ft., and he stated that a gradient was indicated of between 1 deg. in 100 ft. and 1 deg. in 115 ft. No authorities were cited for the conductivities which Mr. Lane assigned to the rocks, and fuller information on this point was desirable; but in view of the fact that the variation in the British Isles from 1 deg. in 34 ft. to 1 deg. in 92 ft. had been characterised as a surprising divergence of extremes from the mean, it was well to emphasise the connexion between gradient and conductivity. At a deep boring in Upper Silesia, the deepest in the world, the highest temperature at a depth of 1,959 metres was about 157 deg. Fahr., and the average increase 1 deg. Fahr. in 62 ft.

The crack-brained persons who, like the Sultan in *Don Juan*, deny that the world is round, because it appears flat to their senses,* might find some interest in the account communicated by Mr. Yule Oldham to the Geographical Section of his and Dr. Wallace's photographic object-lesson in regard to the earth's curvature. They selected for the demonstration a straight six-mile stretch of the Bedford River, between Welney and Denver, where there was a bridge at each end and an uninterrupted length of river between. The height of the parapet of one bridge from the water level was measured, and a mark at the same height set up on the other bridge, and an intermediate mark on a pole, at the same height above water level, at a distance of three miles from each bridge. A telescope was then directed along the line of sight from the parapet on one bridge to the mark on the other, and the intermediate pole mark was seen about 6 ft. above the line of sight. The result, obtained by means of telephotography, was shown on the screen. Sane persons do not of course need such a proof; but considering how completely such a stretch of river would impress the eye as level, there is an almost dramatic effectiveness in having its curvature illustrated in this manner. And if this should meet the eye of the surveyor who once wrote to us to ask "whether the line of sight of a telescope was a straight line in space, or a line following the curvature of the earth,"† it may also serve to clear his mind and that of any others whose wits are similarly befogged.

In the Anthropology Section Mr. J. L. Myres, Mr. Hogarth, and Mr. Arthur Evans described the recent archæological discoveries in Crete; but with these our readers are already well acquainted.

In the Economic Science and Statistics Section the subject of the housing of the poor and working classes was the subject of an animated discussion. It is difficult to see exactly how this subject, any more than education, comes properly under the head of "Science," but one need not quarrel about nomenclature if any assistance is given towards clearing up such a problem. The subject was started by a paper by Mr. A. L. Bowley on Glasgow wages in the nineteenth century, of which we have seen no report. Professor Smart opened the discussion by some remarks full of common sense, but only embodying the opinion at which, we imagine, all thoughtful persons who have studied the subject have arrived, viz., that it was dangerous and inimical to private enterprise if a municipality undertook housing on unremunerative terms; that the question ought to be made clear whether it was the poor or the working classes who were to be housed; and if the former, it should be recognised as a form of poor relief. And if the working classes were to be housed on any terms short of being remunerative, it was an indirect subsidy, and the deficiency was borne by the ratepayers. He also suggested that where local bodies took action in regard to housing their accounts should be open to inspection. Mr. Peter Fyfe, a sanitary inspector, and presumably taking up the cause of the Glasgow Corporation, said he did not think the housing of the poor necessarily involved loss. Defining the poor as those who earned not more than 25s. a week (which is perhaps putting it rather high), he thought they could not be housed without municipal help. There should in the case of loans be a differentiation of the sinking fund from the interest of capital. The sinking fund ought not to be paid for by the rents—for land was not depreciated by time. The rent ought to be only interest and allowance for depreciation of the buildings. Buildings under good by-laws would last 100 years. In his opinion, the sinking fund might be allowed to be repaid in 100 years instead of forty or fifty years. Mr. McBain thought the Improvement Trustees of Glasgow had by no means solved the problem; they had lost a large sum, and no proper account had been taken of the heavy cost of repairs; and if the rents were to be such as Mr. Fyfe proposed, the sanitary requirements of municipalities made it impossible for private persons to build houses for the poor. This is a complaint that has often been repeated, and the necessity for demanding solid and sanitary building no doubt adds to the *crux* of the problem; but it is not the less a necessity for all that. Mr. McBain went on to assert that these cheap houses at small rents were constantly occupied by people who could afford better rents, and who spent the surplus in drink. The Lord Provost declared that the Corporation never built to lose; they had been obliged, however, to go further out of the town; and he admitted that they had not yet tackled the problem of the lowest class. No special decision or resolution on the subject seems to have been arrived at.

In the midst of these sober practical questions, concerned with the life of man and the study of natural phenomena on this planet, Lord Kelvin made on the Tuesday a kind of meteoric appearance in a brilliant address soaring into the region of speculative and cosmical science, the ostensible subject being "The absolute amount of gravitational matter in any large volume of interstellar space." Here we come again on the question of the structure of the Universe—the greatest of all structural questions. Lord Kelvin's address was, we understand spoken, not read, nor did he furnish any written *résumé* for the Press; and as he habitually speaks with a characteristic rapidity of transition from one point to another, we question whether the published reports quite correctly represent on all points, what he said or meant to say. He does not seem to have kept very directly to the nominal subject of the paper. This seems to have been touched, and almost immediately abandoned, at the commencement only of the address, Lord Kelvin drawing a distinction between "matter" simple and "gravitational matter," instancing the presence of ether as a proof of the existence of matter outside the limits of gravitational influence. Considering that ether has hardly advanced to more than the condition of an assumption, one can hardly regard this in the light of "proof:" but we can accept the reasoning that if there is ether it must be imponderable, on the ground that if it extended to all space it could not be subject to gravitation, because in that case its condition would not be stable. After all, "ether" seems to be little more than a new name given to what used to be called "space," in order to save us from the necessity of trying hopelessly to imagine absolute vacuum. But Lord Kelvin said that he had no wish to discuss ether and its peculiarities ("peculiarities" is certainly good of a substance of which we are only postulating the mere existence), but he was rather concerned to show that our universe, meaning thereby (as indeed we should naturally conclude) not the solar system, but the wider space from which the light of the most distant star could reach our telescopes, "was a small affair." The old sin of speaking disrespectfully of the Equator was nothing to this; but Lord Kelvin means that it is within the grasp of thought and of mathematical expression. The space or sphere (assuming it to be spherical, which was not necessary) which he would consider could be expressed very easily in mathematical language, and he would express it by $3{\cdot}09 \times 10^{16}$, a number which would express the number of kilomètres in the radius. This distance was selected because a star situate on the boundary of such a sphere would have a parallax of a thousandth of a second, "or the distance of the sun from the earth would subtend an angle of that amount at that distance." Surely Lord Kelvin must have said, not the distance of the sun from the earth, but the diameter of the earth's orbit. We do not take parallax angles from the sun, as we cannot get there; the received base for the parallax angle of a distant star is the diameter of the earth's orbit—in other words, observations at intervals of six months, affording the longest base practicable to mortals. What follows we quote in the words of the *Times* report, with the exception of correcting an obvious mistake therein of "mètres" for "kilomètres":—

"If the radial force were equal over the whole spherical surface its amount could be expressed as a small but definite fraction of terrestrial gravity, and that every body on or near that surface would experience an acceleration towards the centre, which in the ordinary notation of kilomètres per second, per second would be expressed by 1·37, divided by 10 raised to the power of 13. The velocity acquired per year would be the millionth part of 4·32 kilomètres. In five million years the velocity acquired would be 22 kilomètres a second, if the body started from rest at the spherical surface, and the space traversed would be about one-twentieth of the imagined radius. In 25,000,000 years the velocity would be 108 kilomètres per second, and the distance covered, expressed in kilomètres, would be 4·25 multiplied by ten to the power of 16, or more than the radius of the sphere, which showed that the rate of acceleration could not remain approximately constant for 25,000,000 years. If the system were started at this remote distance of time, the stars would have had the opportunity of acquiring velocities either more or less than the critical velocity of 108 kilomètres, here given, and this velocity agreed with the measured velocity in the cases of stars like *a* Centauri and 61 Cygni, and was not greatly different from the velocities in the line of sight determined by the spectroscope."

This is a curious and almost startling concurrence of observed phenomena with the result of abstract reasoning; unless indeed Lord Kelvin consciously or unconsciously marshalled his mathematical argument up to the known rate of movement revealed by the spectroscope. Then followed the consideration of the probable distance of stars from each other. He was more inclined to assume the existence of 1,000 million such bodies in the assumed space than Professor Young's 100 millions, but nine-tenths of them might be dark bodies, or dark to us (for a reason which appears at the close of the address). If the stars (this postulated number, we presume) were arranged exactly in cubical order, the six nearest neighbours to any sun would have a parallax of $\frac{1}{10}$"; this distance expressed in kilomètres would be about 50×10^{13}. Here we do return again to the nominal subject of the lecture, and Lord Kelvin proceeded to illustrate the question by increasing the possible number of suns and decreasing their size, till, if they were reduced to one centimètre in diameter, the proportion of space occupied to that vacant would be as 27 to 1,000; but we question whether these reported figures can be correct; the proportion of matter to vacancy seems much too large in comparison with the initial statement as to the distances separating the original suns; but we have not had time to attempt following out and checking the figures arrived at. The centimètre suns were

* We had a correspondent who used annually to send us letters and supposed demonstrations on this point, praying for their insertion in our columns. His decease alone put an end to his pertinacity.

† A fact.

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then reduced to the size of molecules, and a consideration followed as to the extent of free path each of these could have without coming in contact with a neighbour; a matter of mathematical analysis. The figure reported seems enormous—10,000 million kilomètres, and we can hardly think it can be correct. The question has of course an important bearing on the nebular hypothesis, a point which was evidently discussed by Lord Kelvin, but not reported. Finally he came to the consideration of the effect of the appreciable time required by light to traverse space. There was irrefragable evidence to prove that the life of our sun as a luminary was but a moderate number of million years—he would put it at fifty million. "The time taken by light to travel from the outlying stars of our sphere would be about 3¼ million times the life of such a star"; and this in a universe which Lord Kelvin calls "but a small affair." We conjecture there is some mistake in that "million." The light from the nearest fixed stars is estimated, if we remember right, to take twenty years to reach us. To give the furthest such an unimaginable time for light-travel seems disproportionate, unless the universe—"our universe," as Lord Kelvin calls it—is to be regarded as practically infinite, an idea which he discountenanced at the outset. Did he not say "3¼ times" the life of the star? That would give us an allowance of about 162 million years for the light travel of the outlying stars. It seems a sufficient conception for a universe which is "but a small affair." The result even in this case is that all the existing stars would never be seen together; for them all to blaze on us at once they would have to be set alight at earlier and earlier periods as we progress outward from the centre to circumference; the earth, for the purpose of this argument, being the centre.

Such calculations and such times and distances, though expressible in figures, are hardly within the grasp of mental realisation. Nevertheless, such speculations serve to lift us above the common and prosaic realities of life; and perhaps it is not the least wonderful part of the subject, that beings who are materially confined to this almost infinitesimal point in the vast ocean of matter, should have the capacity to deal in

"These thoughts that wander through eternity."

At all events, Lord Kelvin's brilliant address was the most remarkable feature of the Glasgow meeting. One cannot but be amused however at the naïve manner in which Dr. Schüster, who seconded the vote of thanks to Lord Kelvin, asked "What was the state of the universe at creation? Were the atoms spread out uniformly or scattered in groups?" It would seem from this that Dr. Schüster has a mind able to conceive the nature of "creation" and the existence of a prior nothingness or nonentity before creation. If so, his brain must be intrinsically superior to that of ordinary man. We may use such words as "creation," but neither the idea of that or of previous non-existence of time or space are thinkable by the human mind.

Illustrations.

TERRACE GARDENS, FOOT'S CRAY PLACE, SIDCUP.

THIS illustration forms part of the second edition of Mr. Mawson's "Art and Craft of Garden Making," which was reviewed in our issue of August 24, wherein is a full description of the house, site, and surroundings pictured in the above illustration.

With the intent of redeeming the gardens from the state of partial neglect into which they had fallen through unoccupation, Mr. Waring, the owner, called in the assistance of Mr. Mawson, who, together with his colleague, Mr. Dan Gibson, after due calculation of the rise and fall of the land, prepared a complete scheme which can be carried out partially or wholly, as deemed desirable, a portion of the work being now in progress. The illustration shows the suggested terracing to the immediate front of the house, the central steps of which lead down to a characteristic beech avenue to the lake.

The idea, as will be gathered, has been to give this house a stately setting in harmony with its architectural style.

"STEEP-HILL," JERSEY.

THIS house occupies the site of an old one; it is set in a typical Jersey garden. The whole of the exterior is rough cast; the roofs are covered with deep red hand-made tiles. The porch is of rough grey granite, with cast lead gutter and semi-dome. Inside, the drawing-room, hall, and library are panelled, the former with deal painted and the latter with oak. The staircase is also of oak.

The plaster ceilings of hall, drawing-room, and library are the work of Mr. Bankart.

The general building and all the joiners' work were contracted for by Mr. Crill, of Jersey.

Mr. Reginald Lloyd, architect, of Jersey, supervised the whole of the work on the spot. The plan and design are by Mr. Ernest Newton. The drawing was exhibited at the last Royal Academy.

DESIGN FOR A MEMORIAL BRIDGE.

THIS sketch is the embodiment of a passing idea, and does not claim to represent a worked-out scheme. The following facts, however, gave rise to it:—

An additional bridge is needed across the Thames between Waterloo and Blackfriars, east of Somerset House, and could be well placed to connect with the eastern spur of the new Holborn to Strand thoroughfare.

This bridge should be much wider than other London bridges, with aisles for slow traffic.

No finer sight, for sight-seeing purposes, could be procured in London now than the centre of the river, at a point around which the great Embankment radiates, flanked by the groups of Somerset House and St. Paul's. A grand memorial arch planted midstream astride the bridge would connect tide and road, and perhaps be an architectural embodiment of the fact that the British Empire is firm rooted in maritime power. BERESFORD PITE.

LEICESTERSHIRE SOCIETY OF ARCHITECTS.

THE following is the address given to the members of the Leicestershire Society of Architects, on the 14th inst., by the President, Mr. S. Perkins Pick. We omit a few introductory words referring to matters of local interest:—

It has occurred to me that this would be an opportune time to say a few words chiefly to the younger members of that body who have taken up architecture as a study and pursuit in life.

All those who take a keen interest in the arts must necessarily be students always; the subject itself is inexhaustible, and the variety of it boundless; it may further be said that the pleasure derived from a knowledge sufficient for the appreciation of fine work, whether displayed in a building, a picture, a piece of furniture, silver, glass, or any other object, is indeed very great. Even this alone ought to be some compensation for the energy and exertion which it is necessary to show in order to obtain sufficient knowledge to reap this advantage; but then there is also that serious responsibility which comes to architectural students a little later on in life of spending other people's money upon work which may be altogether unworthy. The thought of this ought also to make each one of us determined to leave no stone unturned which may lead to better results. To do good work a great amount of care, thought, knowledge, and ability is requisite, and the importance of architectural students acquiring a proper knowledge of the grammar of their calling cannot be overrated. Those who trust to Providence and chance and spend their studentship days listlessly will in days to come have a poor chance of success. Many of our clients—and it is a pleasure to add that they are an increasing number—have a good knowledge and excellent taste in architectural matters. In not a few instances their judgment on buildings, furniture, and decoration is undoubtedly better, and is therefore preferable to that of quite a large proportion of architects who are practising the profession for a livelihood. This ought not to be. Architects should give their art a first place, and their chief aim should be thorough efficiency in this before all things. One hears of, and even knows of, architects who are really geniuses in matters outside their professional calling—men who are extremely clever in quite a variety of ways other than their own, by which is meant other than those which the brass plate at their office door indicates as the mode by which they expect to earn their livelihood. There are instances in which it almost amounts to obtaining money under false pretences, so little does the work of such men justify their existence as architects. But pray do not misunderstand me. We must all have a high opinion of the genius who is capable of doing many things well. We know that there are men who are extremely versatile, and who can do many wonderful works of great variety: It is not to these that reference is made, but to those who make specialities of many other matters rather than their own calling. In other words, there is a strong feeling and desire on the part of all right-thinking persons that men should first be geniuses at their own work, and that other accomplishments should be of secondary importance. Possibly more need not be said to those who have selected architecture as a pursuit in life about the advisability of making architecture and the allied arts their first consideration, beyond this, namely, that the number among the public who have a good knowledge of architecture is rapidly increasing, and it is absolutely necessary, if we as architects are to retain our position as advisers in the matter of architecture, that we should obtain sufficient knowledge and good taste to justify our existence as such.

To obtain this knowledge is really a huge problem, and the earlier we realise this the better for those who venture hereafter to place their confidence in us, and, indeed, the better for ourselves also. To you as students it should be pointed out that the grammar of your work must be acquired very largely in the beginning of your career as pupils; indeed, if the elements are not learnt at this period, it is doubtful if they ever can be attained in after life. Take, for instance, such a subject as the bonding of brickwork; it never is, and cannot be, properly taught in an architect's office, neither can all the practical methods of plumbers', carpenters', stonemasons', or iron-founders' joints, and a thousand and one other technicalities. Then, again, how can the ordinary pupil obtain a proper knowledge of the history of architecture, or of ornament in the ordinary routine of an architect's office? What can he learn there of light and shade, advanced drawing, and more particularly of modelling, and the crafts generally? It doubtless is well known to every one of you that knowledge and accomplishments of this character are not, and cannot be, acquired in an ordinary architect's office. There must, therefore, be found some other solution of the difficulty, and what have we better, or more suitable at any rate, at the present time in this country than our schools of art.

To those architects who take pupils it should be pointed out that they have a duty devolving upon them of a serious nature which is not always properly realised. In a great number of cases the pupil is admitted by the payment of a premium; he is allowed the free run of the office, but beyond this no particular instruction is given, or special care taken, or facilities offered, by which he may attain a proper knowledge of architecture and building. He is, as a matter of fact, generally left to his own resources, and it amounts to a chance whether the pupil fails or succeeds. All this is much too casual. Would it not be desirable and wise to make it a condition that architects' pupils during their articles should spend, say, not less than two days, as well as three evenings, a week in some such institution as this School of Art, and could not more facilities be given for sketching and measuring old work and for study of building works in actual progress? If the student is one whose heart and soul are in his work, and he is imbued with a craving for the knowledge and love of fine work, it matters not so much whether any curriculum is provided for him or not; in fact, there are cases where the so-called natural bent of the industrious student—that rare genius one sometimes hears about—has been rather harmed than helped by it, but even these very rare young men must have facilities for study, and where are they likely to find better materials, at any rate in the provinces, than in a school such as this? Think, too, of the advantages of meeting other students for an interchange of opinions—how one's pet ideas get shot at and hard hit by the competing genius who possibly does not accept the ideas of his

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brother student, and who probably may have quite opposite dreams and fancies of his own of realising an architectural Utopia in some dim and distant future; and, again, what a grand thing it is to make endeavours to lay that "ghost" which appears and disappears with almost the regularity of the moon, viz., "a new style of architecture!"

Let us pause and ventilate our views on this subject, which is always a fascinating one for us. Speaking broadly, with reference to this matter, it may be said (and in my opinion it is so) that there is a great deal too much striving after this phantom of a new style of architecture. It is a delightful thing to have dreams of all this, but there is nothing more dangerous than to endeavour to realise them in solid material. It is not intended to convey by this that you should not aim at originality, but that you should first know and realise the true principles upon which good work has been done in the past, and the altered conditions necessary in a building of to-day. Generally you will find that modern requirements have so altered that by the time you have provided the accommodation required, and got your materials together, there are quite enough new elements in the problem to make it impossible to reproduce any style of old work. And while upon this subject of originality it may be as well to point out that the most original work now being erected is that carried out by the speculative builder and the mediocre architect. Men like Mr. Norman Shaw, and Mr. T. F. Bentley, and Mr. John Belcher, although among the best architects now living, are not anything like so original in their buildings as are the ordinary claptrap architect and speculative builder whose work is so generally prevalent. Does it not occur to you that leading architects of the type mentioned are possibly among those who have a greater knowledge of precedent, have drawn and made a study of old work to a greater extent than most other practising architects? There does not appear in their work any great effort to be particularly original; indeed, it is generally the omission of this which makes their buildings so scholarly and suitable. There is no attempt on the part of such men as these at that drastic measure one sometimes hears of, namely, the smashing up of the styles; but, unfortunately, one too often sees specimens of that by men of smaller attainments; and there can be no discord in music made more trying to the nerves of a fine ear than are the results of some of the attempts at architecture made by these smashers up of the styles. It is quite as essential that a building should be in key and tune, so far as style goes, as it is for the various instruments in an orchestra, that is to say, if there is to be any resultant pleasure to those who have an eye for colour or an appreciation for good composition and form. There is nothing more dangerous to architecture than this craving after something entirely original and new, and we are suffering almost as much from the unrest caused by it as from the lack of education to which reference has already been made. Some short time ago, when discussing the question of harmony in architectural design, a friend retaliated that he disagreed with me entirely, and pointed out that in the finest pieces of music discords were often introduced with great effect. My answer to that is, that these discords could only be used by the musical genius, and, as a matter of fact, it is believed are chiefly used by them to give additional value to the harmony which precedes or follows the discord. A similar discord may be, and often is, introduced by the architectural genius, but here again it is done to give some additional value to the surrounding work.

The argument is this, that music consisting entirely of discords cannot give pleasure to a sane and educated musician. Neither can a building consisting of numberless features out of harmony with each other satisfy the eye of an accomplished architect. The whole question may be summed up by stating that a genius may do daring things and be successful, where the mediocre person will ignominiously fail.

The moral which should therefore be pointed out is "Do not attempt to be too clever." The result of all these attempts at so much originality generally ends in but a poor mediocrity or something worse which ordinarily goes by the name of ugliness.

Well, now to return to the main subject which it is my chief anxiety to lay stress upon, namely, the education of our students in architecture. This is probably one of the most important matters that we can possibly discuss. Some learned men have suggested that it is the public who need education in building and architecture, and not those who practise it as a profession; but my view is that it is the architect who needs looking after, for whatever may be the knowledge, and love, or desire on the part of the public for really fine work, it cannot be of much avail unless architects have the necessarily superior knowledge to satisfy the yearnings of those who wish for something better than what generally prevails. And besides, one's own experience of those of the public who practise amateur architecture is that they never know, and in fact cannot know, sufficient of the subject to justify them in directly giving instructions in building operations. It has been already pointed out that many of the public have a very keen appreciation for good work; the erection of a building is, however, much too complicated a business for any amateurs to ever gain a sufficient knowledge to justify them in being their own architect. Some of us have been told by a client as a preliminary when further building operations have been contemplated to his premises, that for certain buildings which are often pointed to with evident satisfaction, "I was my own architect for that." Well, gentlemen, it is perhaps needless to tell you that this information is generally needless, for the work usually proclaims that lack of knowledge which is the hall-mark of the amateur. On one occasion a client made use of this expression to me, and the quality of the work was surprisingly good. It was rather difficult to understand, but the secret came out when I asked the amateur architect who made the drawings: "Oh," said he, "Mr. So-and-So did that, but they simply embrace my own ideas." Possibly that may have been perfectly true, but nevertheless that amateur architect would not have had so good a result without the assistance of Mr. So-and-So, who must have very cleverly put these so-called "own ideas" in such a form that the builder was enabled to erect a very satisfactory piece of work. It occurred to me that this gentleman, who prided himself in being so clever when acting as his own architect, was very lucky to have found such an excellent ghost to do the actual work; particularly so when it is realised how scarce and difficult it is to find the genuine article.

It is no pleasure to speak to you in a disparaging manner, but it is advisable, especially on an occasion like this, to be candid and honest when speaking on a subject which is of the greatest importance to all of us. The regret with which it is said does not alter the fact, namely, that a very large proportion of architects' assistants cannot even draw decently, much less design a passable moulding or a creditable cottage. Surely there is something wrong in this. What good result can be achieved by such men in work like architecture, if they are incapable of even properly putting any ideas they may have in a sufficiently intelligible form for a tradesman or craftsman to be able to execute the work therefrom? As an opposite illustration, let me call your attention to those, the minority of students, who are capable draughtsmen; does it not occur to you that they are also the most capable designers as well? And is it not within your own knowledge that these men are those who have been enthusiastic workers in our Academy schools, Architectural Association classes, and our schools of art? It does not appear to me necessary to labour this matter, because it must be so well known to you. Therefore, why are there comparatively so few students from architects' offices in Leicester who attend here to improve their knowledge, and to gain that facility, power, and judgment which are so imperative for their work? Is it that students have recently received so much conflicting advice from various enthusiasts, one insisting that they must be first and foremost men of science, another that they must be artists pure and simple, and still another that they must be craftsmen and not draughtsmen; all this resulting in students giving up the whole thing in dismay at the multitude of advisers and the disparity of advice offered by them? Or is the reason to be found in that lack of interest and earnestness which are so absolutely essential before good work of any kind can be achieved? It is rather to be feared that the latter is more likely to be the correct interpretation of the reason why all architectural students do not accept opportunities which are not only offered, but really pressed upon them in these days. Perhaps it ought to be pointed out—and, indeed, it is a pleasure to do so—that we in Leicester are not worse off than the profession in other towns and cities of a similar size.

Indeed, we are assured that the proportion of promising and industrious men is probably larger in our own town than in many other towns, so that the foregoing remarks may be considered as superfluous and possibly unjust. One is quite aware that we have a minority of young and rising men who have acquitted themselves admirably, and who doubtless will in the future do work of a highly creditable nature, and will help to make the Leicester of the future a more interesting city than the town of Leicester to-day. You will probably forgive me for mentioning as an instance the name of our friend Mr. Shirley Harrison, whose power as a designer and draughtsman is very great, and who a very short time ago came out the Ashpitel Prizeman, being the first man of his year at the Associate Examination of the Royal Institute of British Architects. And as another instance, it is a pleasure to mention the name of Mr. Albert Herbert, whose all-round knowledge and refined tastes are quite exceptional; he also distinguished himself at the same examination on a previous occasion by gaining the "Arthur Cates Prize."

There are others among us who have shown improving powers, and some who, Mr. Fletcher assures me, have unquestionable faculties which only need application on the part of the students to make real and rapid progress. But a regret remains, and that is the small proportion of the total number of architectural students who show that rare power and perception to which reference has just been made.

Probably some of you may say that all these exceptional students belong to that select class known as "the heaven-born genius," and indeed it may be admitted that they have some special brain faculties, but you may be quite assured that the most precious gift they possess is the aptitude for intelligent industry, which, properly applied, creates a love of fine work; and when once a student has arrived at the stage of having an appreciation of good work, it is fairly safe to conclude that he will in the future do creditable work himself. No man is actually born with a knowledge of architecture, painting, sculpture, or craftsmanship of any kind. And no man achieves success in any such work without a long and constant intelligent application.

Those students who either cannot, or will not, make the effort to attain a proper knowledge of their work by the necessary sacrifices which the process entails, should give up the idea of being architects or artists; and the sooner the better, not only for themselves, but for the rest of the world.

EXHIBITIONS AND SCHOLARSHIPS IN ART.

THE Board of Education have awarded Royal Exhibitions and Scholarships to the following teachers, students, &c.:—

Royal Exhibitions.—Helen M. Pike, art student-Edinburgh; Arthur W. Pope, art student, Nottingham; Horace Wooller, art teacher, Brighton; Walter S. George, architect's assistant, Ashton-under-Lyne; Charles H. Broughton, art student, West Bromwich; Richard R. Goulden, art teacher, Dover; James A. Stevenson, art student, Chester; Nathaniel Sparks, art student, Bristol; Frank Marlow, art student, Leicester; and James P. Samuel, lithographic artist, Aberdeen.

Local Scholarships: Arthur E. Fowkes, art student, Leicester; Harold A. Rigby, art teacher, Preston; Harry C. Hall, art student, Sheffield; John B. Piercy, art student, Chester; Jessie Kilpin, art student, Leeds; Mary G. Tutin, art student, Nottingham; Frank Gatter, art teacher, London; Peter Mitchell, art teacher, Galashiels; Joseph N. Sanders, art student, Birmingham; Mabel Thatcher, art student, Bristol; Charles Haworth, art student, Liverpool; Ernest Collins, art student, West Bromwich; Ethel Cliff, art student, Leeds; William G. Spooner, art student, West Bromwich; John B. Godson, art student, Leeds; James J. Grant, art student, Aberdeen; Frederick N. Smith, art pupil teacher, Bridgwater; Ethel K. Pitt, art student, Bristol; Albert H. Greenfield, art teacher, Brighton; and Ellen Hill, art student, Bradford.

A Royal Exhibition is tenable for three years, and entitles the holder to free admission to the Royal College of Art, London, or the Metropolitan School of Art, Dublin, for the session of

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about forty-two weeks each year, and during that time to a maintenance allowance of 25s. a week and third-class railway fare for one journey to and fro, each session, between the home of the exhibitioner and London or Dublin. The Royal Exhibitions are held on the condition that the exhibitioner regularly attends the course of instruction laid down for him, complies with the rules laid down for his guidance, and makes satisfactory progress. The allowance may be withheld or reduced in the case of a student who fails to attend as prescribed.

A Local Scholarship is tenable for three years, with a maintenance allowance of 20*l.* a year, at any School of Art under the Board which is open at least three days and five nights a week, and which will remit the fees for instruction of the holder. The scholar must attend a School of Art during at least forty weeks in the year for thirty hours each week, of which eighteen hours at least must be in day. The scholarship commences on the date at which the school where the scholarship is tenable re-opens after the summer vacation in each year. The maintenance allowance is paid quarterly, on the receipt of a certificate from the Master and Secretary of the School of Art that the scholar has attended regularly and pursued his studies satisfactorily.

COMPETITIONS.

MARKET HALL, LLANRWST.—A competition for a new market hall, &c., at Llanrwst, in North Wales, has just been decided. The successful design is for a building of Penmaenmawr granite, relieved with Yorkshire stone dressings, and was sent in by Mr. E. Grubb, of South Shore, Blackpool, to whom has been awarded the premium of 20*l.* There were twenty competitors.

RUSSIAN TIMBER TRADE.

THE question of the partial exhaustion of the timber supply is briefly and lightly touched upon in Mr. Consul Woodhouse's Report to the British Foreign Office on the trade and commerce of the Riga district. He remarks that one broad fact as regards the wood trade of the world in general is ever before us. It takes from sixty to seventy years to grow an average convertible tree, and two minutes to hew it down. Thus each year the supply of timber is diminished, the forest fringe recedes further and further from the ways and means of transport; each year the expense of working out the forests is increased by the extra distance the logs have to be carried. Then, owing to the nature and manipulation of the trade, consumption and supply cannot keep pace with each other; one is continually catching up the other, and the consequences are rises and depressions. But in the opinion of all who know anything about timber, and have studied the great question of supply, there must be a steady increase in the price of every description of wood goods, and each flood-wave of rising prices will attain a higher level than its predecessor. Even now (observes Mr. Woodhouse), at this moment of greatest depression and stagnation, prices are at a level which a few years ago would have been regarded as high. As far as the Riga sawing trade is concerned, the forests which furnish the timber are now so far away from the rivers which carry the logs that Riga cannot be supplied unless prices are fairly high. If 70 per cent. of the cost price of a log in Riga consists of the expenses incurred in bringing it down from the forests, it is clear that a reduction can only be made on the remaining 30 per cent. By these remarks the British Consul does not, he assures his readers, intend to imply that the supply of timber is reaching its end. There is still plenty of timber, but it is becoming comparatively so inaccessible that in many parts it can only be worked out when prices rule high. Higher prices will always render accessible for supply those forests which were not considered worth while to work at low rates. It is much the same, in fact, as with coal and the working of deeper levels. Reviewing the operations of last year and the first half of this year, Mr. Woodhouse recalls that the spring of 1900 opened with abnormally high prices for sawn timber, both red and white. Unfortunately, however, for the Riga sawmills, they possessed in the aggregate only about 35 per cent. of their usual first open water stocks. As soon as the fresh rafts arrived the buying of logs was very keen, and astonishingly high prices were paid for the raw material, and early in the season every sawmill was hard at work cutting night and day in order to take advantage of the high prices ruling abroad for sawn goods. A rapid rise of freights, however, came as an unpleasant surprise to many who had sold goods ahead c.i.f., and a rate of 40s. was paid by sellers who had calculated on chartering at 25s. This great rise in freights checked the flow of business, Riga shippers being afraid to go on selling c.i.f., and the extra rate of freight, added to the already abnormally-high f.o.b. prices of sawn goods, made buyers hold back from purchasing. By September the consumption abroad also seemed to fall off, and, although freights had begun to get easier, it became more and more difficult to sell goods except at a reduction in prices all round. Riga sawmill owners, having by this time bought heavily of logs at high prices, were disinclined to accept lower figures. They imagined that the slackening of prices was only temporary, and that it would be better to hold over their goods until the spring; but in this they made a mistake. In January of the present year they might have sold a large proportion of their stocks at a reduction of only about 10s. per standard on the spring prices of 1900, but they all held stolidly back. Unfortunately, the sellers of other wood-producing countries followed the same policy. They all had large stocks, and thus by their waiting they brought about a rout along the whole line. Consumption, instead of improving, became slacker, and meanwhile buyers had discovered that stocks abroad were heavier than they had been led to suppose. As spring came on and the time for shipping drew near, the mill-owners of all countries began to feel restless, for, contrary to their experience of previous years, they had sold nothing; they therefore began to approach the buyers. These, however, soon understood the position. They were being offered goods from all sides, and they either held back or offered much lower prices. Those of the sellers who accepted proved to be the luckier ones, for as spring advanced each sale was at a progressively lower rate, while the buyers, who had bought first, thinking they were doing well in getting their goods so much cheaper, soon found themselves at a disadvantage with their competitors who had waited. The consequence of all this is that prices have tumbled all round, and yet there is no large buying, for, seeing prices continually dropping, buyers have grown nervous; there seems to be "no bottom," and now they are only buying from hand to mouth. The position in Riga is that there are unusually large unsold stocks for this time of the year,* and all who are able are still holding out, as they cannot bring themselves to face the loss which the selling-off at present low prices would entail. At least 90 per cent. of the mills are standing, most of which will probably remain idle until the autumn, as, by not adding to their stocks, they hope to dispose of what they have at better figures and stop the rout. The actual stock of sawn goods in Riga this last spring was barely an average one, and may be put down at 90,000 standards, against the usual 110,000 to 120,000 standards. In Sweden and other wood-growing countries, however, stocks were heavier. This year there will probably not be more than from 16,000 to 17,000 log rafts floated down to Riga, against 21,000 to 22,000 logs last year, a decrease of 25 per cent. or thereabouts.

The exports of wood of all kinds from Riga during the year 1900 amounted to 46,550,000 cubic feet, value 1,500,000*l.*, as against, in 1899, 46,700,000 cubic feet, value 1,748,870*l.*

Correspondence.

To the Editor of THE BUILDER.

THE DOUBLE CHOIR OF GLASGOW CATHEDRAL.

SIR,—The interest and importance of the subject may excuse a few notes on the valuable review of my book, "The Double Choir of Glasgow Cathedral," in your number of the 14th inst. It is, I think, something more than "a very unlikely conjecture" that the church of Jocelin at Glasgow, so far as it had been carried out, was pulled down by Walter. We know that this church was under construction between 1180 and 1190, and that accordingly a large part of the existing structure has been attributed hitherto to the twelfth century. Your reviewer accepts, however, my ascription of this work to Bishop Walter (1208-1232) as having "much likelihood." But if the work is of the thirteenth century, how are we to account for the disappearance of Jocelin's building, with the exception of a few fragments that have been built into the walls of Walter's chapel, and what other conclusion can we come to than that the unfinished work of Jocelin was pulled down by Walter? The fact also that Walter should have used some of the worked stones of Jocelin's church in adjoining the temporary altar and shrine of Kentigern, if so much is admitted, is further evidence that the earlier building had to give place to the later. There are not wanting instances of unfinished and even of completed works of the eleventh and twelfth centuries that were pulled down soon after their erection to make way for larger structures in the newer style then in course of development. Willis states that Lanfranc's choir at Canterbury was pulled down twenty years after its completion ("Canterbury Cathedral," p. 63). Viollet-le-Duc mentions that in France, at the beginning of the epoch of great cathedrals, the portions first constructed were sometimes pulled down to make way for still more magnificent projects ("Dictionnaire de l'Architecture," vol. ii., p. 284). Mr. E. S. Prior, at p. 70 of his recently published work, informs us that "the fabrics of most of the eleventh and twelfth century presbyteries have perished." The existing buildings, I think, demonstrate that in many cases the earlier work must have perished at the hands of the builders of the twelfth and thirteenth centuries. If it is the case that the unfinished choir of Jocelin was pulled down by Walter, it may be accepted, I think, as an incident in some measure characteristic of this particular period.

In quoting Viollet-le-Duc, to the effect that "all the great cathedrals of central France were begun, and to a large extent carried out, between the years 1180 and 1240," I have perhaps somewhat distorted his meaning. By way of amends I cite the passage referred to in his own words: "La période pendant laquelle les grandes cathédrales eussent dû être conçues et élevées, celle pendant laquelle leur existence est pour ainsi dire un besoin impérieux, l'expression d'un désir national irrésistible, est comprise entre les années 1180 et 1240" ("Dictionnaire de l'Architecture," vol. ii., p. 284). It is, of course, true that some of the extended cathedrals were founded before 1180, but the great wave of enthusiasm for cathedral building in central France is limited, according to Viollet-le-Duc, to sixty years.

The statement that the ridge-rib is never found in the earlier vaults may require some qualification, but the case of Ripon transept is in some measure covered by the reference on p. 43 to occasional instances "of partial anticipation of a still undeveloped trait." The ridge at Ripon is scarcely entitled to be called a rib; it is rather a slender ridge moulding, decorative in purpose and quite unlike the constructionally evolved ridge-rib of the thirteenth century. Such as it is, it is of great interest, but it does not touch an argument founded on the introduction of the ridge-rib into the vaulting system.

The suggestion that the tierceron was introduced to support the ridge-rib, as well as to help to carry the infilling, is not mine, but is given by Viollet-le-Duc ("Dictionnaire de l'Architecture," vol. iv., p. 117). In view of the number of dislocated ridge-ribs that we find, it is, I think, well founded.

The particular type of vault that I refer to as having been introduced about 1270 is the one with abbreviated ridge-ribs in both directions, while the nave vault at Lincoln has, I think, a continuous ridge in one direction. Probably I have not been sufficiently explicit on this point. It may be added that the dates in connexion with the development of vaulting are in some degree tentative. I know of no authoritative guide on the subject, and certainly make no claim to lay them down from my own knowledge or observation.

I agree with your reviewer that the carving of the capital of Jocelin's pillar (fig. 11) might be of the twelfth century, and have said so in the footnote on p. 33. I think, however, that it is more probably of the early part of the thirteenth century. So far as my observation goes, this type of carving is usually associated with mouldings of a later character and a capital of different form from the one in question. I shall hope for further assistance in determining the interesting point whether this capital, apparently of the twelfth century, owes its carving to the date of its re-erection in the early part of the thirteenth century or whether it was originally carved as we see it.

I have not stated that the materials of the clear-story were raised by a screw-jack. All that we know is that the larger stones were grappled by a "lewis," similar in principle to those in use to-day, and that they were then raised vertically by means of a mechanical appliance of some kind—probably of the windlass and pulley species. The screw-jack is figured as being the most powerful engine for raising loads that was known to the builders of the thirteenth century.

I have made no attempt to treat the cathedral exhaustively, or to correlate its architecture with any particular school of English Gothic. "Plan, bay design, piers, capitals, bases" are referred to incidentally, but my main purpose has been to show that in the vaulting we have a master-key which opens up to us much of the history and chronology of the building. It reveals the successive changes of plan of the middle vault; it affords some insight into the mind of the designer at each stage, and enables us to follow the steps by which the result as we now see it has been attained. I join in the hope that my work may be tested by the careful examination of others, and its deficiencies by this means amended.

T. L. WATSON.

BOOKS RECEIVED.

BRICKLAYING AND BRICKCUTTING. By H. W. Richards. (Longmans, Green, & Co.)

REPORT OF THE CHIEF LABOUR CORRESPONDENT ON STRIKES AND LOCK-OUTS OF 1900 (Eyre & Spottiswoode. 10½d.)

* Mr. Woodhouse's Report is undated, but it reached the Foreign Office in London on August 16, 1901.

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The Student's Column.

GAS AND GAS FITTINGS.

13.—INCANDESCENT GAS BURNERS.

BURNERS WITH CHIMNEYS.—In this country all public gas supplies consist of illuminating gas, and in order to produce a non-luminous flame which will not deposit soot upon the mantles, the gas is consumed in "atmospheric" burners of the Bunsen type. The gas under pressure is made to issue in one or more fine jets in an upward direction into a vertical tube having holes formed in its sides near the base. The gas in its uprush draws air also into the tube through the side holes, and a mixture of air and gas flows to the head of the burner, and when ignited burns with a non-luminous flame. The efficiency of the flame so obtained depends upon the proportion of gas to air in the mixture, and the completeness of the mixing operation.

In the earlier forms of Welsbach burners the proportion of air drawn into the tube was not sufficient to produce a non-luminous flame of the required shape unless a chimney were used with the burner to create an updraught, and thus bring a strong current of air in contact with the surface of the mantle and flame. When the glass chimney supplied with burners of this description (fig. 29) is removed from the burner, the gas cannot obtain sufficient air for complete combustion until it has escaped through the network of the mantle, and a large proportion of the heat which should be utilised in bringing the mantle to an incandescent condition is lost.

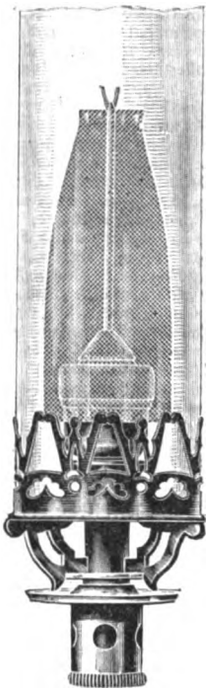

Fig. 29.—Welsbach "C" Burner, with Chimney.

The proportion of air required for combustion of the gas varies with the richness of the gas in illuminating hydrocarbons, and consequently the length of the glass chimney should be varied in accordance with the quality of the gas to be consumed. An 8-in. chimney is of sufficient length for use with London 16-candle gas, while for 14-candle gas a 6-in. chimney would be suitable, but with the 20-candle to 26-candle gas supplied in some parts of the North of England and Scotland a 10-in. or 12-in. chimney is required.

Effect of Dust or Dirt on the Burners.—In the course of a few weeks a considerable quantity of dust from the mantle, or from other sources, accumulates on the wire gauze of the burner, and on the gas nozzle near the air holes. The presence of this dust often reduces the light emitted by the mantle by fully 50 per cent. To remove the dust, lift the head of the burner off the Bunsen tube without removing the mantle from the head. Blow gently up the tube of the part removed in order to blow the dust off the gauze, and then unscrew the Bunsen tube from the nozzle from which the gas issues and remove the dust from the nozzle also. Then replace the parts in their original positions and relight the burner. Whenever a new mantle has to be placed on the burner, the latter should first be freed from dust.

Deposition of Soot upon Mantles.—The deposition of patches of soot upon incandescent mantles is caused by imperfect combustion of the gas. Imperfect combustion is usually due to the burner being in a dirty condition, and consequently producing a flame having more or less luminosity. Even a very feebly luminous flame will speedily produce a deposit of carbon upon the mantle. By-pass burners in which a small luminous flame is used to ignite the main flame without necessitating the use of a match are often rejected on account of their liability to blacken the mantles and to be extinguished by draughts. The small by-pass flame is often of sufficient size to come in contact with the mantle and to leave a black patch upon it. When burners without governors are used it is often impossible to avoid altogether this blackening, because the by-pass must pass sufficient gas to prevent the flame being extinguished when the pressure falls to its lowest point, and even when adjusted to the smallest dimensions under the lowest pressure the flame becomes sufficiently elongated when the pressure increases to its maximum point to come in contact with the mantle and blacken it. A useful by-pass device which gives two small non-luminous flames situated on the sides of the socket which receives the rod used to support the mantle, and which are not easily extinguished, has recently been invented by Mr. A. Clarke. It is a marked improvement upon burners having a luminous by-pass jet, but has not yet come into general use.

Chimneyless Incandescent Burners.—In 1898 the Welsbach Company placed upon the market a new burner for incandescent gas lighting which did not require a glass chimney. This burner is known as the "Welsbach-Kern" burner, and has attained great popularity. Bandsept had introduced a chimneyless burner a few years earlier, which was largely used for public lighting, but was not so serviceable for domestic lighting as are the small sizes of the Kern burner. The use of burners without chimneys is made possible by effecting a thorough mixing of the gas and air in the most efficient proportions before the mixture reaches the point of ignition. The light efficiency per unit of gas consumed obtained from the mantles when these Kern burners are used is found to be considerably greater than that obtained from the older forms of chimney burners; but owing to the hissing noise emitted by the chimneyless burners many consumers still prefer the less noisy chimney burners. It is stated that the production of a hissing noise is an indication that an excessive volume of gas is being consumed, and that the gas cock should be adjusted until the noise is no longer observable; but in practice this procedure is always found to produce an immediate diminution in the intensity of the light emitted. The average consumer will always adjust his burner to give the maximum amount of light, without regard to the gas consumption.

The effect of slightly increasing or decreasing the proportion of air to gas in the mixture issuing from the burner is shown in the following table published by Professor Lewes, who made a series of experiments with a chimneyless burner. The gas supply was maintained at a constant rate under a pressure of 1½ in., and the air supply was regulated as required. The gas used for the experiments was 16-candle London gas:—

Condition of Flame.	Rate of flow.		Ratio.		Candle-power per cubic ft. of gas.	Temperature of mantle 1 in. above burner-head.
	Gas. c. ft.	Air. c. ft.	Gas.	Air.		
Under aërated..	4·5	10·0	1	2·2	14·4	1880 C
Best aërated....	4·5	12·75	1	2·75	20·0	1915 C
Over aërated ..	4·5	15·25	1	3·4	17·7	1905 C

It was found by experiment that 1 volume of the gas required 5½ volumes of air for complete combustion, and it is therefore evident that the best results are obtained with 16-candle gas when half the total quantity of air required for combustion is mixed with the gas before the point of ignition to produce the inner zone of flame, while the second half enters into combination after ignition of the gas and produces the outer zone of flame in which the mantle is suspended.

High-pressure Burners.—By increasing the pressure of the gas supplied to the burner and increasing the consumption, it is found that a higher illuminating value per unit of gas consumed can be obtained than with low-pressure gas, and for street lighting with lamps of high candle-power high-pressure burners are being extensively adopted. Most of the high-power burners can be used without chimneys, but require a glass guard to protect the mantle from wind and the gaslighter's torch.

The Welsbach-Kern High-pressure Burner.—This burner closely resembles the Kern burner used with gas under ordinary pressures, and can readily be taken to pieces for cleaning (fig. 30). The burner is intended to be used with gas supplied under a pressure of 8 in. to 10 in., and is said to give a light of 30 to 35 candles per cubic foot of gas consumed per hour, as compared with a light of 20 to 25 candles per cubic foot obtained with the ordinary Kern burners. With a consumption of 10 cubic feet of gas per hour the high-pressure Kern burner is said to yield a light of 350 candle power.

At present gas is commonly supplied under a pressure of less than 3 in., and for high-pressure systems it is necessary to use compressing apparatus to raise the pressure to 10 in. or 12 in. When calculating the cost of a high-pressure system of lighting the cost of the compressing apparatus must be included.

There is, however, no reason why the gas companies should not be called upon to increase the pressure of the public supply to

Fig. 30.—Welsbach-Kern High-pressure Burner.

a. Burner complete. *b.* Burner with mantle removed.
c. The detachable parts of the burner; viz., outer cone, Bunsen tube, and inner cone.

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10 in., since with the aid of inexpensive governors the consumer can readily reduce the pressure to any desired point; and it has been repeatedly demonstrated that by the use of suitable mains and fittings gas can be distributed under this comparatively high pressure without undue loss by leakage.

The Self-intensifying Kern Burner.—The Welsbach Company claim that results almost equal to those obtained with high-pressure gas can be obtained with gas under low pressure when consumed in the Self-intensifying Kern burner. This burner (fig. 31) is intended for use in the lighting of streets or industrial works. It is a Kern burner so modified that with the comparatively large gas consumption of 10 cubic feet per hour the head of the burner is sufficiently small to fit into a No. 4 high-pressure Kern mantle, a slight alteration being

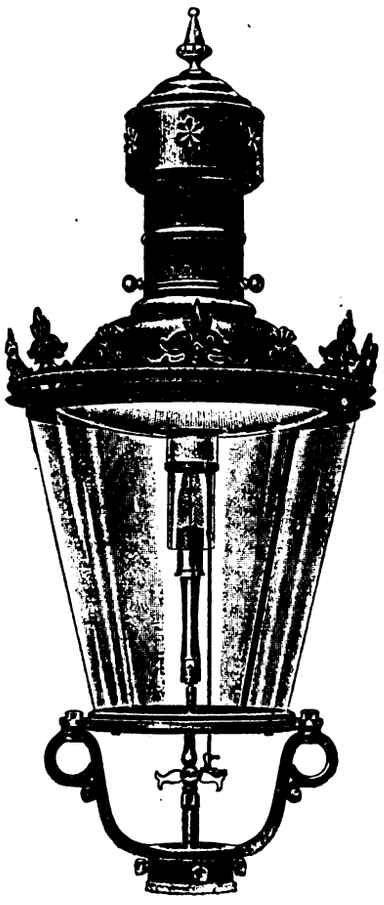

Fig 31.—Self-intensifying Kern Burner, with "Shadowless" lantern.

made in the internal construction of the burner head. In the upper part of the lantern in which the burner is placed is a metal chimney from the lower end of which is suspended a glass chimney. The glass chimney surrounds the mantle, and the so-called "self-intensification" is due to the draught produced by the elongated chimney thus formed. It is claimed that a light of 300 candles is obtained with a consumption of about 10 cubic feet of gas per hour.

Compressing Apparatus.—To raise the pressure of the gas supplied to the burner to the 10 or 12 in. required for high-pressure gas lighting many devices have been adopted. In the Scott-Snell lamp the waste heat from the burner is employed to actuate a novel compressing apparatus which is located a short distance above the mantle; and in other systems, motors actuated by water supplied from the street mains are used. In the latter case the cost of the water must be taken into consideration when estimating the cost of the light, and it is usually found with all high-pressure systems that the mantles have a shorter life than when used with gas supplied under low pressure.

Anti-vibration Devices.—When incandescent gas lights were first used for street lighting it was found that the number of mantles broken by vibration and shock caused by the passage of heavy vehicles over the roads was so great as to almost prohibit their employment in the main thoroughfares. A number of anti-vibration devices were, however, soon invented and placed on the market, and some of these are now extensively used. They are mostly of simple construction and depend upon the interposition of some description of spring between the burner and the gas supply pipe to which it is attached. Those which depend upon the elasticity of india-rubber should be avoided, since this material perishes with comparative rapidity, and is affected by changes in the temperature of the atmosphere.

Advantage of Incandescent Lights over Luminous Flames.—The principal objections to the use of gas are:—(1) The heat generated is out of proportion to the light obtained; (2) The flames are usually more or less smoky, especially in draughty situations, and quickly blacken the walls and ceilings; and (3) The withdrawal of oxygen from the air and the formation of carbon dioxide by combustion of the gas is prejudicial to health. The luminous flames most commonly used are flat flames or argand flames, burning not less than 5 cubic feet per hour, and having an illuminating power of about fifteen candles. When these are substituted for incandescent burners, it is usual to introduce a burner giving a light of sixty candles for a gas consumption of 3·5 cubic feet per hour for every 15-candle flame previously in use. Consequently, a better light is obtained, the gas consumption is reduced 30 per cent., less heat is generated, and, owing to the use of a non-luminous flame as well as to the reduction in the temperature of the air and products of combustion rising from the burner, the ceilings are less rapidly blackened.

On the other hand, the mantles for which the high retail charge of 7½d. is at present made in this country require renewing periodically, and in some households are a constant source of trouble.

Until mantles less fragile than those at present manufactured are introduced the incandescent system cannot be regarded as altogether satisfactory, but great progress has been made since 1886, when Welsbach's earliest mantles were placed on the market, and there is every reason to believe that other improvements equally important may be made within the present decade.

Avoid Powerful Lights of Small Area.—The use of intense lights of small area should be avoided as much as possible in all systems of lighting. A 60-candle power light emitted from an area of 1 in. is more irritating to the eyes, and less serviceable for illuminating purposes, than a light of the same total intensity emitted from an area of, say, 6 in. Two No. 1 Welsbach-Kern burners fitted in suitable positions with good diffusive shades will effectively illuminate a dwelling-room of ordinary size (say, 22 × 15 × 10 ft.), although each burner consumes only 1·5 cubic feet of gas per hour, and has an illuminating power of probably only twenty-five candles; whereas a single burner having an illuminating power of seventy candles, and used without a shade, will be found to brilliantly illuminate one portion of the room while another part is left in comparative darkness. The fact that the two small burners have a total illuminating power of only 50 candles for a consumption of 3 cubic feet, while the larger burner gives a light of 70 candles with the same rate of gas consumption, does not necessarily prove that it is better to use the single burner instead of the two small burners. The electric arc light has a high illuminating power, but no one would select it for the illumination of dwelling-rooms, since it possesses in a marked degree the feature which it is most desirable to avoid—*i.e.*, it emits an intense light from a very small light-emitting surface.

GENERAL BUILDING NEWS.

PRIMITIVE METHODIST CHURCH, CHESTER-LE-STREET.—The foundation-stone of the new Primitive Methodist Church has just been laid at Chester-le-Street. The new church has been designed by Mr. J. W. Taylor, architect, of Newcastle, and will be built by Messrs. Davison & Bolam, contractors.

UNITED METHODIST FREE CHURCH AND SCHOOLS, FENTIMAN-ROAD, SOUTH LAMBETH, S.W.—The opening ceremony of these buildings took place recently. The buildings, which have been erected on a prominent corner site, are designed in Perpendicular Gothic, freely treated. The facings are of red bricks and the dressings of Bath stone. The roofs are covered with green slates. The church, school, and church-parlour gables all face Fentiman-road; the school, however, is set back to give prominence to the church. A square tower, containing angle entrance and staircase to the small end gallery, forms a prominent feature at the corner of the block; this is terminated by a small lead-dressed spirelet and vane. An octagonal narthex is a feature in front, and this contains the two main entrance-doors to the church. The church consists of nave, transepts, and apse, with side organ-chamber opening by arches into both apse and church. Accommodation for the choir is provided in the apse. A traceried and carved stone pulpit and dwarf screen on either side extending across the apse are the gift of a member of the church. A large platform, furnished with carved and traceried oak communion table and chairs, is placed in front of the pulpit and is surrounded by an oak handrail supported by carved oak newels and wrought-iron and copper standards. The seating is circular on plan. The apse arch is moulded Bath stone, supported by shafts with carved caps. The transept arches are carried on dwarf Irish green marble columns with stone caps and corbel bases. The accommodation of the church is for about 650 persons. A large schoolroom (which is arranged to be divided off into a number of classrooms), with gallery around, with wrought-iron grille in front, is provided, also church-parlour, vestry, ladies' working-room, library, infants' room, kitchen, with lavatories, &c. The whole block is lighted by electricity, the fittings being of wrought-iron and copper work. Low-pressure hot water has been adopted as a means of heating the buildings. The cost of the entire block is about 7,000*l.*, and has been carried out by Mr. J. O. Richardson, Peckham, S.E., from the designs and under the superintendence of Messrs. George Baines & R. P. Baines, architects, Clement's-inn, Strand, W.C.

CHURCH, PERTH.—A new church has been erected on the site of the old one by the congregation of St. Paul's United Free Church. In the front elevation the principal feature is the end gable of the church, with two four-light windows with cusped and panelled heads in the lower stage, and a large five-light window with traceried head and deeply-moulded joints lighting the gallery. The gable flanks are enriched with panelling, and the apex has an arcading of cusped panels with a central niche, over which a floriated cross forms the terminal feature. To the left of the main gable is a projecting stone porch, with wide moulded archway, forming the principal entrance, and to the right another doorway serves as exit from the gallery. The ladies' room and session-room form a two-story block to the left of the main entrance. The side elevations are simply treated with two tiers of triplet windows, the upper ones having trefoil cusped heads under an arch. Internally the church is divided into nave and side aisles by moulded columns and arches of wide span. The nave ceiling is semi-octagonal in form, divided into bays by arched timber ribs. Over the side aisles the main couples are also shown and filled with ornamental timber cusping. The church is planned with side and end galleries, but the side galleries are narrow and recessed at the columns. The total number of sittings provided will be 800, and the estimated cost is within 4,000*l.* The architect is Mr. John B. Wilson, Glasgow, and the works have been carried out under his instructions by the following contractors:—Mason, Mr. A. Beveridge; joiner, Mr. William M'Quibban; slater, Mr. D. M'Lauchlan; plumber, Mr. James M'Leish; plasterer, Mr. John Peebles; glazier, Mr. C. Alexander; electrical appliances, Mr. M'Leish; and Mr. Thomas L. Kay is clerk of works.

WESLEYAN CHURCH, TOTNES.—A new Methodist church and school were opened in Fore-street, Totnes, on the 19th inst. The building is of limestone, with Portland stone facings, and is entered over a flight of granite steps. In the south-east corner there is a tower with a short turret. New schoolrooms have also been built on the site, and were opened about a year since. The aisles are paved with wood blocks, and the seats are made of pitch-pine. The windows consist of stained glass. Messrs. Reeve, Son, & Full were the contractors, and Messrs. Bridgman, of Paignton and Torquay, were the architects. The cost of the building, including the purchase of the site, is about 3,000*l.*

UNITED METHODIST FREE CHURCH, WESTCLIFF-ON-SEA.—The foundation-stone of this building was laid on the 21st inst. The church is Late Perpendicular Gothic in style, freely treated, and is faced with red bricks externally, the dressings and tracery being of white Costessey work. The roof is covered with green slates. The main gable is flanked on the one side by a dwarf octagonal turret and on the other by a bold square tower, the latter terminating in a spirelet. The church is designed for future deep double transepts, but these are at present only to be erected to a depth of a few feet. A large school and classrooms are provided for in the future. The present portion is being erected by Messrs. Battley, Sons, & Holness, Old Kent-road, S.E., and the cost amounts to 2,124*l.* The architects, whose designs were accepted in a recent competition, are Messrs. George Baines & R. P. Baines, Clement's-inn, Strand, W.C.

BAPTIST CHURCH, LEWIN-ROAD, STREATHAM S.E.—The tender of 3,033*l.*, submitted by Messrs. W. Johnson & Co., Wandsworth, has been accepted for the erection of this building. A square tower and spire above form a feature of the design and front elevation. The building is faced with red bricks, and the dressings are of white Costessey work.

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The roof is to be covered with green slates. The architects, whose designs were selected in a competition held some years ago, are Messrs. Geo. Baines & R. P. Baines, Clement's-inn, Strand, W.C.

CHURCH, NEWTON, OYSTERMOUTH. — The foundation-stone of the proposed new Church of St. Peter, at Newton, Oystermouth, was laid recently. The proposed church is eventually to seat 600 persons, and provision is now being made for 400 The total cost will be about 6,000*l.* Mr. Bruce-Vaughan is the architect, and Mr. Howells, Cardiff, the contractor.

PROPOSED ENLARGEMENT OF FISHPONDS CHURCH, BRISTOL.—It is proposed to enlarge the parish church of Fishponds. The enlargement, if carried out, will provide additional seats for 271 persons, at a cost of 1,700*l.* Plans have been prepared by Mr. E. H. Lingen Barker, architect.

BOARD SCHOOLS, GLOUCESTER. — The new Hatherley-road Board School, intended for the Lower Barton-street district, was opened on the 16th inst. The schools have been erected by Messrs. J. Gurney & Sons, of Gloucester, from designs and under the superintendence of Mr. Alfred J. Dunn, on a plot of land about 2¼ acres in extent, at a total cost, including playgrounds, playsheds, fence walls, caretaker's house, &c., of 11,548*l.* 10s., the accommodation being for 992 children.

INFANT SCHOOL, FRASERBURGH, ABERDEEN.—A new infant school, erected by the Fraserburgh School Board, to accommodate 600 scholars, was opened on the 18th inst. by Lord Saltoun. The school is designed by Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen, and is estimated to cost about 6,000*l.* when completed. The school is built on a site over two acres in extent in the west end of the town, at the corner of Victoria-street and Windmill-street. It is a one-story school, the buildings being about 140 ft. in length and 70 ft. deep. The design provides ten classrooms, a hall, teachers' rooms, and cloakrooms for the children. The central part of the building is the hall, 85 ft. long by 21 ft. wide, while to the rear are built out, close together, six of the classrooms, each under a separate roof. Four of these rooms, each 21 ft. by 23 ft., extend the same length as the hall. The other two at either end are larger rooms, 21 ft. by 25 ft., and the structure of them is brought forward by wing blocks which provide other four classrooms, one at either end, in line with the hall, 21 ft. by 25 ft. and 21 ft. by 21 ft., and the other two in front, 20 ft. by 25 ft. and 16 ft. 6 in. by 26 ft. The space between these two latter, which project several feet outwards, and which form the front of the school, is utilised for the cloakrooms and teachers' retiring-rooms. The school is built of a light grey-coloured stone from the Peathill Quarry, near New Pitsligo, the front and east side being of dressed masonry, and the back and west side of ashlar work. The flooring and wall linings are of pitch-pine, the inside doors and all finishings of American yellow pine, and the structural work of Swedish redwood. The classrooms afford accommodation for from fifty to sixty scholars each, who will be on raised galleries. Each of the classrooms is provided with a fireplace and ventilated on the Boyle system of ventilation. There is extensive playground accommodation, at the north end of which is a stretch of shelter sheds, with latrine conveniences built of enamelled brick. The contractors for the work are:—Mason, Mr. William Davidson, New Pitsligo; carpenter, Messrs. Brebner & Jenkins, Fraserburgh; plumber, Mr. Archibald Russell, Fraserburgh; slater, Mr. James Reid, Fraserburgh; plasterer, Mr. Alexander Wiseman, Fraserburgh; and painter, Messrs. Mitchell & Mitchell, Aberdeen.

FREE LIBRARY, GRANGETOWN, CARDIFF.—A few months since the first of the sectional lending libraries of Cardiff was opened in new buildings in Splotland. The second one was declared open at Grangetown a few days ago, and the third is fast approaching completion at Roath. The new library at Grangetown is situated on the junction of Clive-street and Redlaver-street. The architect was Mr. E. M. Bruce-Vaughan, whose design was selected in an open competition. The building is of red brick with stone facings. The contractors were Messrs. D. Thomas & Son, and Mr. Tom Taylor was clerk of the works.

COTTAGE HOSPITAL, EBBW VALE.—A cottage hospital for accident cases has been erected at Ebbw Vale, at a cost of over 3,000*l.* The architects were Messrs. Lansdowne & Greggs, Newport, Messrs. S. T. Davies & Sons, Ebbw Vale, being the contractors. The building is situated near Hillside House. The ground floor contains the matron's suite of rooms, entrance hall, receiving room, and operating theatre. The floor is mosaic, and the walls of adamant cement. The second floor contains a main ward with five beds and a cot, No. 2 Ward with four beds for more serious cases, and a special ward with one bed. There is also a day room for convalescents, opening out by means of French windows to a large verandah. The second floor also contains a bathroom, kitchen, lavatories, &c.

ASYLUM, KINGSEAT, ABERDEEN.—The foundation-stone has just been laid of the hospital at Kingseat, forming part of the asylum buildings for the Aberdeen City District Lunacy Board. The extent of ground set apart for the asylum buildings, including cricket and recreation grounds, is about 40 acres The plans were entrusted to Mr. A. Marshall Mackenzie, A.R.S.A., architect, Aberdeen. The ground is laid out in three sections. In the first place, what may be termed the general section consists of the administration building, kitchen, and stores, laundry, steward's house, hall, medical superintendent's house, conservatory, gardener's and engineer's lodges, &c. Then the second section is that devoted to industrial work. It consists of what are termed colony villas, two for male patients, accommodating respectively forty-two and thirty-two persons each; and two villas for female patients on an exactly similar plan and with similar accommodation. The female colony is placed on the east of the administration block, and the male to the west of these buildings, while at a convenient point between the two villas for male patients are the workshops, where those who are physically fit will be employed in occupations suited to their skill and capacity. On the other hand, the villas for the female patients have been erected not far from the laundry, where, as well as in the kitchen, a number of the patients who are capable will be employed in useful occupations. The villas are comfortable buildings of two stories. On the ground floor of the villas for females there are a kitchen, dining-room, dayrooms, bathroom, with stores, &c. The first floor is entirely devoted to dormitories, with two or three rooms for special uses. The same arrangement applies to the villas for male patients, which are each under the charge of a married caretaker, who has two rooms allotted to his use. Coming to the medical section, the principal building is the hospital, which is of two floors, but a second story is planned to be erected over the part of the hospital devoted to administration purposes. On the ground floor, on one side, are three large dormitories and a dayroom for female patients, and exactly similar accommodation on the opposite side of the block for male patients, and there are single rooms off the dormitories attached to all the wards, which will be used for special cases. An isolation ward will also form part of the plan, with accommodation for about four male and four female patients in each. The centre building of the block consists of medical superintendent's rooms, waiting-rooms, and admission-rooms. On the upper floor is accommodation for nurses and doctors during the day, consisting of parlour or sitting-room, bathrooms, &c. The dormitories are ventilated on the Plenum system. On either side of the hospital there are observation villas, one for male and the other for female patients, who are provided to the number of thirty-seven in each building. On the lower floor of each are dayrooms, dining-rooms, kitchen, and other accommodation, and in the floor above are dormitories and single rooms. In addition to all the accommodation described there are four closed villas, two for male and two for female patients, who require, from the nature of their cases, special treatment and supervision. For the females the villas accommodate respectively thirty-five and twenty-seven patients each, and the villas for males are substantially the same. The recreation hall, which occupies a prominent position on a circular piece of ground near the centre of the asylum area, is intended to give accommodation for 400 persons. For the nurses of the institution special provision is made in what may be termed the nurses' home, fitted up with comfortable bedrooms. Among the buildings on which substantial progress has been made is the power house, laundry, and kitchen administration block. For the hospital the whole of the excavations are finished. The work will now be pushed rapidly on under the superintendence of Mr. Alex. Souter. Roughly speaking, the cost of the property, including the water rights and the whole of the buildings, amounts to over 70,000*l.* The contractors and the amount of the contracts are:—Mason work, Mr. Edgar Gauld, 26,983*l.*; carpenters, Messrs. Hendry & Keith, 10,526*l.*; slaters, Messrs. Adams & Co., 2,521*l.*; water, Messrs. Blaikie & Sons, 3,784*l.*; ironwork, Messrs. Grant & Co., 1,151*l.*; plumber, Mr. A. B. Robertson, 6,748*l.* The plaster-work has not yet been contracted for.—*Aberdeen Journal.*

HOSPITAL EXTENSION, SALFORD.—The Mayor of Salford opened on the 18th inst. two new pavilions which have been erected at a cost of 20,000*l.* as an extension of Ladywell Sanatorium. Built from the designs of Mr. Henry Lord, the two pavilions are provided with eighty beds. The chambers, apart from the wards, include a "sun room" and a retiring hall.

ARTISANS' DWELLINGS, BRIDE'S ALLEY AREA, DUBLIN. — The work of constructing suitable residences for the artisan classes in this long-neglected quarter of old Dublin is proceeding with fairly satisfactory rapidity under the personal supervision of the City Architect, Mr. C. J. MacCarthy. At present the first section of dwellings, comprising nine separate blocks, and containing in all seventy-two tenements, is rapidly approaching completion. The contract for this section of the work is upwards of 17,000*l.* The second section of the building operations is also well advanced, the walls being 15 ft. over the ground. This section comprises eleven blocks, containing sixty-six separate tenements or flats, several of these being intended for the use of the better class of artisans. Some of them will be three-roomed, and will, it is expected, readily let at 5s. to 6s. per week, while others will be two-roomed, with a probable rent of 3s. 6d. to 4s. 6d. per week; but all, whether two- or three-roomed, will be self-contained. The cost of this section will be about 15,000*l.*, or 32,000*l.* for both. Mr. James Donovan, of Harcourt-street, is the contractor for both sections. When all is completed and the 138 tenements fully occupied, accommodation will be available for some 700 persons, allowing five to each family, and the Bride's-alley area will have undergone a wonderful change from its former dreadful condition. The third and concluding section in the same area has not yet been begun, but will be commenced in due time.—*Irish Times.*

TECHNICAL DEPARTMENT, MECHANICS' INSTITUTE, PUDSEY.—The new technical department of the Pudsey Mechanics' Institute has just been opened. Mr. Herbert Hodgson, of Pudsey, is the architect. The eight classrooms, two on each floor, which form the principal block of the new building, have a turreted gable facing Waver Green, where there is a separate entrance. All the windows in the staircases and landings are stained. The classrooms themselves are inter-communicating on each floor. All the heating is done by low-pressure hot water. The two large classrooms in the basement will be used as workshops, and the old tearoom on this floor has been enlarged so as to be available for use as two classrooms. Altogether, this and the extension generally will provide accommodation for 600 students over and above those for whom room is found in the older premises. Lavatories and cloakrooms are provided on each floor.

COTTAGE HOMES, CULCHETH, LANCASHIRE.—On the 19th inst. the chairman of the Salford Board of Guardians laid the foundation stone of cottage homes which the Board is proceeding to build at Culcheth for children. Various sites in Lancashire and Cheshire were visited within a radius of twelve miles. Twiss Green estate Culcheth was eventually decided upon, and 45 acres of land were purchased for 4,500*l.* The Board appointed Mr. H. Lord as their architect, and his plans were finally adopted. The provision made comprises eleven semi-detached homes, accommodating twelve children each, with rooms for the foster mother. There are also two single homes accommodating twelve each, and making the total accommodation 288. There will be an infants' school and a mixed school to accommodate 399 boys, girls, and infants, while the hospital will accommodate sixteen children and the requisite staff. The administrative block includes workshops, bakery, laundry, bandroom, and swimming baths, and an electric light installation. A superintendent's house is provided. The estimated cost of the work, including building and furnishing, is 63,711*l.* There will be playgrounds, and the elder boys will be taught various trades and the girls instructed in sewing and housework.

WORKMEN'S DWELLINGS, BRISTOL.—From the annual Report of the City Engineer's department of the Bristol Corporation we learn that workmen's dwellings are being erected, in accordance with the requirements of the Local Government Board, for the purpose of rehousing those persons whose dwellings have been pulled down under various schemes of street improvement. Four sites have been selected, all in densely-populated districts, and sixty dwellings are in course of erection. The dwellings are divided into two classes: a first-class house contains a living-room, 14 ft. by 13 ft. 10 in. by 8 ft. 6 in.; two bedrooms, average size respectively, 14 ft. by 8 ft. by 8 ft. 6 in., and 9 ft. 3 in. by 9 ft. by 8 ft. 6 in.; wash-house, 8 ft. by 4 ft. 6 in. by 8 ft. 6 in. Maximum number of persons, five. The second-class houses contain living-rooms, 14 ft. by 13 ft. by 8 ft. 6 in.; bedrooms, 12 ft. by 9 ft. 6 in. by 8 ft. 6 in.; wash-house, 8 ft. by 4 ft. 6 in. by 8 ft. 6 in. Maximum number of persons, three. The following are the sites upon which the various dwellings are being erected—viz., Chapel-street, St. Philip's, fourteen first-class, ten second-class; Bragg's-lane, St. Jude's, six first-class, four second-class; Millpond-street, Baptist Mills, sixteen first-class, four second-class; Mina-road, two first-class, four second-class. The buildings are of red brick, and the roofs are covered with double Roman tiles. The tenements are built in pairs, one situated on the ground floor, and the other on the first floor. Those on the ground floor are approached direct from the street, but those on the first floor from an iron verandah, 3 ft. wide, which runs the whole length of the building, and is reached from the street by a wide, open fireproof staircase. The living-rooms are well lighted, and provided with an open kitchen grate with oven. Each bedroom has a fireplace fitted with a mantel register grate. In the wash-house are a boiler and small coal cupboard. The floors are of cement concrete, floated up to a smooth face. The dwellings on the ground floor have a back as well as a front entrance, but those above can only be approached from the verandah before referred to. At the back of each block of tenements is a spacious yard laid with tar paving, and is available for the use of all persons occupying the dwellings. Galvanised-iron ash-bins are provided for general use. The drainage of the buildings has received special attention, and each pair of tenements has an intercepting chamber between it and the main drain. The drains are ventilated throughout.

COLLEGE, SCARBOROUGH.—The new college at Scarborough, which has been erected on the Weaponness Estate, South Cliff, has just been

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opened. The buildings include a schoolroom 54 ft. by 24 ft., six classrooms, reading-room, dining-hall to seat 120 boys, covered playground, and cycle-house, dark-room for photographers, four large dormitories, ten small bedrooms, sick-rooms, lecture-hall for science teaching, preparation room, and large chemical and physical laboratories. The total cost of the building, apart from the furnishing, has been about 12,000*l.* The architects are Messrs. Hall, Cooper, & Davis, of Scarborough and London, and the contractors are as follows:—Mr. W. Overton, brick, stone, and plaster work; Mr. G. Scales, carpentry and joiner work; Messrs. Appleby & Brogden, ironwork; Mr. G. F. Wells, plumbing work; Mr. Joseph Hargreaves, tiles; Mr. Thomas Fidler, painting; Mr. H. C. Fehr, London, sculptor work; Messrs. Emley & Sons, Newcastle, heating and ventilating; Messrs. C. White & Co., London, school furnishing; Mr. T. B. Jowsey, entrance gates; Mr. W. Malton, roadways; whilst the grounds are being laid out by Mr. L. Thompson, of Scarborough. The building was described and illustrated in our issue for August 10.

TECHNICAL SCHOOL, NEW BRIGHTON, CHESHIRE.—On the 21st inst. the new technical school, New Brighton, was formally opened. The school has been erected at a cost of 5,400*l.* upon a site at the corner of Field-road and Rawson-street, Upper Brighton, and has been designed by the District Engineer and Surveyor (Mr. W. H. Travers), and erected by Mr. John Gourley, contractor, of Liscard and Liverpool. It is built of Ruabon brick with Storeton stone dressings. An external feature is an octagonal tower containing a teachers' room on each floor. The building is two stories in height, the main entrance being in Field-road. The ground floor comprises vestibule, inner hall, classroom, to be used temporarily as a reading-room, cooking and laundry classroom, with pantry and stores, workshop, cloakroom, and lavatory; while the second floor includes two classrooms and a science lecture-room. The heating and ventilation have been carried out by Messrs. Dargue, Griffiths, & Co., Liverpool. The electric light installation is the work of Messrs. Brewer & Brunt, Hoylake. The floors generally are of fireproof construction, finished chiefly with wood-block paving.

ESSEX CHURCH, THE MALL, KENSINGTON.—This church, which some fourteen years ago took the place of the old Essex-street Chapel, Essex-street, Strand, under a scheme approved of by the Charity Commissioners, has during the summer vacation had extensive works executed to it, and to the large assembly hall and schoolroom underneath the church. The timber roof of the church has been cleaned and varnished, and the whole of the internal brick and stone work throughout the interior thoroughly brushed down and cleaned, including the Bath stone and alabaster reredos. The old gas-fittings have been removed, and the church has been lighted by electricity. In the assembly hall and schoolroom underneath the church the electric light has also been installed, and a new heating apparatus has been fitted to heat this part of the building independently of the church. The cost of the various works has amounted to upwards of 450*l.* The work has been carried out under the direction of Mr. H. Chatfeild Clark, the architect of the church, the building works being executed by Messrs. Campbell, Smith, & Co., the new heating apparatus by Messrs. Edwards & Son, and the electric light installation by Mr. Herbert Nash.

LADY BAY MISSION CHURCH.—The new portion of this church has just been dedicated. The Lady Bay Mission was established about three years ago, as an adjunct to the parish church of West Bridgford. A temporary iron church, with seating accommodation for 170 persons, was erected, but its capacity was soon considerably outgrown, and the erection of a more commodious building was decided upon. The first portion of this has been completed, and will be used in conjunction with the western portion of the iron structure for the present. The extension consists of a nave and small chancel, 56 ft. in length and 28 ft. wide, giving, with the old building, a total length of about 80 ft., and affording accommodation for 550 persons. The building is of red brick, with stone facings. The nave has an open roof, with semi-circular pitch-pine principals, and the chancel arch is of red sand brick. The extension has cost between 400*l.* and 500*l.*, and is from the plans of Mr. W. R. Gleave, of Nottingham, the builders being Messrs. W. H. & J. Simons. As funds permit and requirements dictate, it is intended to carry the building westwards to a frontage upon Pierrepoint-road. The final part of the scheme will include the erection of a church of more pretentious architectural appearance upon a site in the vicinity, and the building now partially completed will be eventually used as a church hall and Sunday school.

SANITARY AND ENGINEERING NEWS.

BRIDGE, MONQUHITTER, ABERDEEN.—On the 14th inst. the new bridge just completed over the Turriff Burn at Mill of Pott was opened for traffic. The new bridge is of one span. Mr. Ferguson, Fyvie, carried out the mason work; the iron-work was entrusted to Messrs. Abernethy & Co., Aberdeen; while Messrs. James Duncan & Son, architects, Turriff, were inspectors of works.

PADSTOW DRAINAGE.—On the 19th inst. a Local Government Board inquiry was held at Padstow by Colonel A. G. Durnford into the scheme to provide a water supply to the town. It is proposed to adopt a source at a distance of about four and a half miles, where springs will be collected and conducted to a receiving chamber, and thence to a service reservoir at an ample elevation above the town. The Inspector visited the source with the Engineer, Mr. Gordon W. Harris, and carefully investigated the means to be adopted to avoid pollution.

STAINED GLASS AND DECORATION.

ST. STEPHEN'S CHURCH, AVENUE-ROAD.—This church has been in process of decoration. The chancel is treated in colour and gold; on the upper part of the east wall are angels with censers in adoration of the Agnus Dei; on each side of the window under canopies with a mosaic background are the figures of St. Stephen and St. Andrew. The reredos (yet to be finished) will be rich in gold ornament, and the Four Evangelists painted in gold with gesso backgrounds. The side walls are diapered, supported by arcading, with emblems of the Passion in gold, and a dado in reds, green, vellum, and gold. The nave walls are diapered, with borders to the wall plate and window headings; the spandrels are filled with ornament in salmon, red, and green, with various devices in white on red grounds Round the base of the nave walls is the text, "Now have I chosen and sanctified this House that My Name may be there for ever, and Mine eyes, and Mine heart shall be there perpetually." The work has been designed and carried out by Messrs. H. G. Bartlett & Co., of Brixton.

FOREIGN.

FRANCE.—There is some talk of the Municipal Council of Paris acquiring the Hôtel de Sens, with the view of making an annexe to the Historical Museum of the city.——The Mairie of the XIXth arrondissement of Paris is to be enlarged.——The jury in the competition opened by the Municipality of Lous-le-Saunier for the rebuilding of the theatre in that town, recently destroyed by fire, has awarded the first premium to MM. Georges and Tony Ferret, architects, of Bourg, and the second to M. Jules Pelletier, of Lous-le-Saunier. The third premium was not awarded.——The fine bronze group by M. Frémiet, of St. George and the Dragon, is shortly to be placed in the centre of the large gallery of the Petit Palais of the Champs Elysées.——The death is announced, at St. Etienne, of M. Barthélemy Chaperon, an architect in the department of Monuments Historiques.

INDIA.—A large bridge of three spans of 12-ft. girders is under construction at mile 40·22 on the eastern section of the Eastern Bengal State railway, to protect the permanent way from floods.——It is proposed to substitute new steel girders for the existing weak 10 ft. to 25 ft. spans on the South Indian Railway.——The Kopili Bridge on the Assam-Bengal railway is now completed. It consists of three 100-ft. span girders and eighteen 60-ft. span girders.——A considerable addition is being made to the Bengal-Nagpur railway by the construction of a branch line from Ramkanali, chiefly for the conveyance of minerals.——We learn that the total outlay of the Public Works Department in restoring buildings in Assam damaged or destroyed by the great earthquake of 1897 amounts to Rs. 41,12,000 up to the end of 1899-1900. This does not include the cost of extensive repairs to roads and bridges in certain districts.——The proposed railway line in Kashmir, to run from Jammu to Srinagar, will traverse the Larulari and Banihal passes. The top of the latter pass is 9,328 ft. above sea level, and will be pierced by a tunnel about 5,670 ft. in length. ——The combined military secretariat and foreign offices in Calcutta, designed by Mr. Banks Gwyther, are to be erected on the Belatee bungalow site, taking in some adjacent grounds. The design shows a central main carriage entrance, which is treated as a Classical portico feature surmounted by a pediment.——Additions are about to be made to the Medical College and Eden Hospitals in Calcutta, to accommodate the nursing staff.——A new building has been commenced at the Presidency General Hospital, Calcutta, to accommodate certain kinds of infectious cases.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Lansdell & Harrison, architects, have removed their offices from 38, Bow-lane to 65 and 66, Basinghall-street, E.C.——Messrs. Doulton & Co. have opened new showrooms at 30A, Paradise-street, Birmingham, for the display of sanitary fittings, fireplaces, wall panels, &c.

ELECTRIC LIGHTING, WORKSOP.—About two years ago the Urban District Council of Worksop obtained the provisional order for providing electric light, and in October of last year commenced to build a generating station at their depôt on Canal-road. This has been completed under the direction of Mr. A. B. Mountain, M.I.E.E., of Huddersfield, the consulting engineer, and the plant was a few days ago opened. The buildings consist of a boiler-house, to accommodate four Lancashire boilers, of which two have been fixed at present, raising steam up to 600 h.-p.; engine-room for two 100-kilowatt plants, and three 150 ditto, with the necessary condensing plants, pumps, boosting plants, and switch-boards. The plant at present fixed is sufficient to generate electricity for 11,600 lamps of 8 c.-p., and there are also accumulators provided.

DISCOVERIES AT RABY CASTLE.—Lord Barnard is now restoring and renovating the chapel at Raby Castle, and during the work of clearing the walls of a layer of plaster some interesting discoveries were made. The chapel is the oldest portion of the castle, dating from the middle of the fourteenth century; and at the west end was disclosed a six-light window of that period, about 14 ft. wide and 8 ft. high, walled up with solid masonry about 2 ft. thick. This was completely removed, with the almost perfect sills. Head, jambs, mullions, and tracery are now to be seen. This was evidently originally an open screen, or unglazed window, opening from the end of the chapel into the "Baron's Hall," the side of which abuts on it, and was, no doubt, for the purpose of enabling persons in the hall, or general living-room, to participate in the services which, prior to the Reformation, took place at the altar opposite. On the south side was found a fourteenth-century doorway and a beautiful three-light window of later — probably, fifteenth century—work. This, too, seems to have been an unglazed window or screen between the chapel and a small chamber or pew. Another discovery is the ancient fourteenth-century aumbry, which has been found nearly perfect in the east wall, to the south of the altar.—*Standard.*

PROPOSED ABATTOIRS, ST. IVES.—The Corporation of St. Ives having applied to the Local Government Board for sanction to borrow 1,000*l.* for the provision of public slaughter-houses near the road between Nanjivey and the Stennack, an inquiry was held in the Town Hall on the 19th inst. by Colonel A. G. Durnford, R.E. The Borough Surveyor (Mr. J. Grenfell) produced plans of the proposed buildings, and in reply to the Town Clerk stated that the nearest dwelling-house to the site proposed was 33 yards distant, and that was the property of the Corporation, who were prepared to pull it down if there was any objection to it. The walls of the proposed buildings would be 2 ft thick, and the floors of cement concrete.

NEW THOROUGHFARE TO TOWER BRIDGE.—A portion of the new roadway, from the Tower Bridge to Artillery-street, skirting the churchyard of St. John the Evangelist, Southwark, has been open for eighteen months, and now a new section has been opened—that between Grange-road and the Bermondsey New-road. From Artillery-street the road passes under the ornamental arch of the South-Eastern and Chatham Railway Company's widened line, and is perfectly straight from the Tower Bridge to the Church of St. Mary Magdalene, Bermondsey, where, in order to avoid passing through the churchyard, it sweeps in a grand crescent into the Bermondsey New-road. A third section is nearly completed. The pavement throughout, on both sides (some 12 ft. wide), will be bordered by trees—a few already have been planted.

STONEHENGE.—The great leaning monolith at Stonehenge has been raised into a perpendicular position. The stone was encased in a cradle of strong timber to prevent it from cracking, and strong ropes were carried to two powerful winches, by means of which the raising was effected. The monolith was shored up on every side with timber, and every precaution was taken to guard against an accident of any kind. Now the stone is raised it presents quite an imposing appearance. It stands 21 ft. above the ground, its total length being about 29 ft. 6 in., and its estimated weight more than 30 tons. The excavations necessary for putting in a bed of concrete on the north-west side of the stone will now be proceeded with in the most careful manner, and it is believed that some important discoveries will be made near the famous altar stone.—*Standard.*

RUSSIAN THEATRE SAFETY COMMISSION IN LONDON.—Count Suzor, the President of the Russian Theatre Safety Commission, is now on a visit to London inquiring into the effect of our regulations in regard to the protection of theatres from fire He has made an inspection of the British Fire Prevention Committee's new testing station, with a view of creating similar facilities for research at St. Petersburg, under a scheme mooted in connexion with the terrible fire losses which have occurred in Russia during recent years.

NATIONAL PHYSICAL LABORATORY, BUSHEY.—We are asked to mention that the floors in this building, briefly described in our last issue, are being laid with patent pitchpine woodblock flooring from the Cement, Concrete, Asphalte and Wood Pavement Works, Farnworth.

LEGAL.

EMPLOYERS' LIABILITY ACT.

LABOURER'S FALL DOWN A HOLE.—QUESTION AS TO CONTRIBUTORY NEGLIGENCE.

AT Marylebone County Court on Monday, before Judge Stonor and a jury, William Thomas Smith, a

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bricklayer's labourer, 19, Charles-street, Queen's-road, Notting-hill, brought an action under the Employers' Liability Act, against Messrs. Babcock & Wilcox, Limited, contractors, &c., 30, Farringdon-street, E.C., claiming damages in respect of personal injuries sustained, owing—it was said—to negligence for which the defendants were responsible.

Mr. John O'Connor, counsel, appeared for the plaintiff, and Mr. Addington Willis, counsel, for the defendants.

Plaintiff's counsel explained that on January 28 last his client was in the employment of the defendants, working at the Notting Hill Electric Lighting Company's depot at Wood-lane, Shepherd's Bush. In order to get some castings and fittings fixed as soon as possible the plaintiff, with a few other men employed by the defendants, was working overtime. At about a quarter to twelve at night the defendants' foreman fitter, Logan, told the plaintiff to go to the tool-house, about 100 yards away, and fetch a spanner.

In answer to the judge, the learned counsel explained that the defendants were doing the work in question under a contract with the Electric Lighting Company.

Continuing, Mr. O'Connor said it appeared that between the boiler-house, where the men were working, and the tool-house, there was a hole some 15 ft. deep, in which a coal elevator was to be erected. No lights were about, and as the plaintiff was on his way to the tool-house he fell down the hole, seriously injuring both wrists and hurting his back and face.

The plaintiff bore out his counsel's opening statement, and in cross-examination admitted that when he found it pitch dark outside the boiler-house he did not go back and ask for a lamp, although he knew that there were two on the job. He had several times prior to the accident seen the hole down which he fell.

Other evidence having been given,

John Logan, an engineer's fitter in the employ of the defendants, said that he had charge of the job in question. He admitted giving the order to the plaintiff to go to the tool-house and fetch a spanner, but said he was not aware that the spot near the hole was in complete darkness. He had spoken to one of the Electric Lighting Company's officials about having the electric lights turned on all night, and understood the official to consent.

The Judge: You can't say exactly what answer he gave?—Witness: No, I only took it by his muttering that he agreed with what I said. There was no definite answer that I can recall.

Continuing, the witness stated that at six, and also at seven o'clock, on the night in question, the electric lights were on. Afterwards he was working in a furnace and could not see that they had been turned off.

The judge put questions as follow to the jury:—1. Do you believe that the witness Logan had the conversation with the Electric Lighting Company's engineer, and understood that the electric lights would be kept in during the time the men were working? 2. Do you think that the witness Logan was justified in thinking that the lights were still in when he gave the order to the plaintiff to fetch the tool? 3. Do you think that the plaintiff was guilty of contributory negligence in knowingly and willingly running the risk in question?

The jury answered the questions in the plaintiff's favour, assessing the damages at 70*l.* 5*s.*

His Honour gave judgment accordingly, with costs.

Counsel for the defendants asked for liberty to bring a new trial on the ground that the jury's answer in the negative to the third question was against the weight of evidence.

His Honour intimated that application for a new trial would have to be made in the usual way.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

9,535.—A COMBINED LEVEL AND STRAIGHT-EDGE: *A. Thom.*—A removable double spirit-level for plumbing and levelling purposes is mounted upon a graduated straight-edge, and for inclined work is provided a pivotted strip to be clamped with wing-nuts and a graduated slot at any small angle required. For fastening the spirit-level may be used either a stud and keyhole arrangement or a tapering dovetailed groove to correspond with a feather upon the straight-edge.

9,574.—BEAMS AND GIRDERS: *G. Slockfisch.*—For carrying the ends of the joists extended flanges are fashioned upon angle, channel, T or I-section beams and girders, and transverse webs are added for strengthening purposes.

9,601.—FIREPROOF CONSTRUCTION: *W. Seefels and O. Soldan.*—Metal lathing or light open metal-work, fixed between standards, girders, &c., and overlaid with cement, plaster, or concrete, constitute the material for building hollow fireproof floors, ceilings, walls, and so on; in the case of an arch a skeleton frame is made up with curved and straight laths or strips, and for a hollow wall or partition the skeleton frame is made of U-shaped strips and cross strips, together with cross-shaped or double T-shaped standards, with bolts, rivets, and clips; for stairs, some strips, set lengthwise, are joined with triangular strips, and in the concrete at the front of each step is embedded a channel iron bar to be filled in with lead or other suitable material; at either side is a channel-iron girder and an angle-iron girder for carrying the framework.

9,620.—FITTINGS FOR LAVATORIES: *B. G. Smith.*—The inventor seeks to avoid the necessity for soldering by making the trap and overflow-pipe constitute one piece of casting, a socket is provided for the fixing of the overflow outlet, and the basin outlet is screwed on to the trap.

9,626.—FASTENINGS FOR WINDOWS: *J. H. Edwards.*—To one sash is secured a casing to which is pivotted a tumbler recessed for engagement with a lug upon a plate affixed to the other sash. On the tumbler are projections which engage respectively with a weight that slides in the casing and a projection from the plate. For opening the window one lifts the weight on to a rest in the casing where it is freed by the tumbler. For closing the window the weight is lifted by means of the engagement of two projections, and when the tumbler has thus assumed the "locking" position it cannot be worked since the weight has fallen behind it. A modified adaptation provides for lifting the weight and turning it into a horizontal position about the projections which serve for pivots, when one wishes to open the window.

9,033.—STOVE-PIPE FITTINGS: *G. Pickhardt.*—The pipe of a portable stove is inserted into an annular space that consists of a hollow metal cylinder fixed to the wall and a conical tube at the inner end of the cylinder, the free end of the stove-pipe being secured in its place with springs or other means.

9,643.—APPARATUS FOR USE WITH LIFTS: *J. Fletcher.*—By this apparatus bolts are shot beneath the bottom of the cage when the well-door is opened; a shaft having pinions at its ends that engage with sliding rack bolts carries a wheel set so as to engage with a worm upon a shaft above, a pinion upon the upper shaft is in gear with a rack upon the bottom edge of the sliding door; the bolts therefore are shot into the well and supply a support for the cage with the opening of the door; the inventor contrives also that bevel gearing shall impart the movement of the door to the rack bolts.

9,654.—CONDUITS FOR ELECTRICAL CONDUCTORS: *J. Hamblet and I. Parkes.*—Clay forced into a mould fashions a triangular socket, and clay pressed through a die fashions the body of the conduit. A die or core that fits the interior of the socket is fitted on to a table that will rise and fall, and cores or plugs for making the passages are bolted on to the bridge-pieces, as the table and socket fall the mould, which falls with them, touches the heads of some supporting bolts. The die has rounded recesses for making the rounded ends of the partitions, and as the socket is being moulded air can escape through holes in the die. The contrivance is described as being applicable for making conduits with two, four, or more passages.

9,671.—APPARATUS FOR USE IN DEEP-BORING: *A. Raky.*—The inventor contrives that the rocking-lever may be shifted so as to obviate the need for removal of the frame when percussive tools are to be replaced with diamond drills. He makes guides (on the frames) of a pair of open rails or of a frame whereof one side is hinged, or of a single rail with which forked pieces upon the lever will engage. Projections from the lever can be engaged with or liberated from the guides by the action of rack and screw-and-worm gearing.

9,725.—BRICKLAYING AND WALL BUILDING: *E. H. Vordtriede.*—Recesses in the bricks above take ribs on the bricks next below, and there are grooves at the corners of the bricks for vertical keys; a wall may be built of bricks having double interlocking ribs and grooves secured with double dovetailed keys, and portable temporary structures may be built without the use of cement or mortar; in the case of hollow walls there are recesses in the inner vertical edges of the bricks that will fit with spacing keys which join interlocking bricks together.

9,727.—A COMBINED REGISTER AND HOOK FOR USE WITH CRANES: *C. H. P. Michael.*—A spring-controlled disc is pivotted between the two side plates of the hook, and over it is a register or counter from which hangs a rocking lever having a forked end for engagement with a pin on the side of the disc; as a load ascends the sling will engage with a recess in the disc, so that it becomes closed and locked through the engagement between a spring bolt and a stop, and when the bolt has been freed with a key the disc is turned again into the open position, and so enables the counter or register to do its work.

9,730.—APPLIANCE FOR ELECTRICAL SWITCHES: *F. S. Worsley and F. J. Green.*—For a double-pole switch there are arms that project from an insulating boss turning upon a fixed spindle and that carry U-shaped contact pieces. Two pins which turn the boss engage with teeth of a sleeve turning upon a boss which is attached to the spindle. In a slot in the boss will slide a locking cross-bar which is in the sleeve, being pressed up by a spring into a groove in the cover of the sleeve. The bar is to be pressed downwards with a key inserted into the cover, so that one can turn the cover and the switch contacts together.

9,746.—AN ELECTRICITY METER: *A. Wright and Reason Manufacturing Company.*—In a mercury voltameter the electrodes of mercury are disposed outside two porous diaphragms, the electrolyte being between them, and thus form two containers for the mercury; for purposes of registering may be utilised the overflow of the mercury cathode from a porous pot into a measuring-tube, the anode being kept at a rather higher level with mercury admitted from a feeding-bulb; for the two containers can be substituted parchment or similar bags attached to vertical measuring-tubes wherein the cathode mercury will rise and the anode mercury will fall. Confer also Nos. 2,222, 5,046, and 5,593 of 1900.

9,702.—A COMPOSITION FOR USE IN BRAZING: *H. Garner.*—A protective composition for use in bending, brazing, and kindred operations consists of borax and boracic acid mixed with water or any other suitable liquid—the admixture is to be applied as a coating which can be wiped off afterwards, and it is claimed to be available as a flux in brazing.

9,779.—A WINDOW-SASH FASTENER.—*N. W. Spaulding.*—A curved spur that projects from a plate on one sash is to be engaged with a slotted arm which is pivotted to a plate upon the other sash, when the arm is lifted for separating the sashes a lug upon the slotted arm will engage with the spur-plate, the movement of the arm is restricted with a stop and it will fall down so as to engage with the spur through impact of the spur-plate and the lug as one shuts the window.

9,808.—CONSTRUCTION OF PARTS OF BUILDINGS: *L. de Vallière.*—For girders, beams, bressummers, ceilings, floors, and so on the inventor devises a material composed of concrete in which are embedded rounded tension rods made of iron, together with flattened helical coils of wire of which the sides have an inclination of 45 deg., more or less, to the rods.

9,813.—APPARATUS FOR VENTILATION: *J. W. Thomas.*—A valve that opens vertically is so disposed within a turret provided with louvres, and above the roof-crest that when it is shut its upper flange fits around the seating, for lifting and lowering purposes is provided a cord having at its end a stirrup that will engage with an automatically fixing-hook which is held in its place (when the stirrup is hooked) through the engagement of the rear end of the hook with a rack; a scale—adjusted in accordance with the temperature of the outer air—serves for determining the extent of the necessary opening of the valve, and a flap or windmill appliance is placed over an opening outwards in order to indicate any variation between the relative air-pressures, inside and outside, which the ventilator should be adjusted to remedy.

9,907.—STONE-DRESSING MACHINERY: *T. Stiglis.*—The threaded portion of the spindle that works through a ratchet wheel retained in one direction with a pawl turns the tool round at its return stroke, whilst a crank-and-slot movement, driven with bevel-gearing from a flexible shaft, imparts the reciprocatory motion; a saddle, which traverses the cross-head, carries the tool-holder, and screws will vertically adjust the cross-head upon the frame, which is moved upon the rails by means of screws—by another arrangement the stone itself is moved.

MEETINGS.

SATURDAY, SEPTEMBER 28.

Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection at the Richmond Main Sewerage Pumping Station and Purification Works, Kew Gardens, 3 p.m.

TUESDAY, OCTOBER 1.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. H. R Kenwood on "Water: Composition, Pollution, and Purification." 7 p.m.

WEDNESDAY, OCTOBER 2.

Builders' Foremen and Clerks of Works' Institution—Ordinary meeting of the members. 8 p.m.

Sanitary Institute (*Lectures and Demonstrations for Sanitary Officers*).—(1) Inspection at Lambeth Disinfecting Station, Wanless-road, Loughborough Junction, 3 p.m. (2) Dr. H. R. Kenwood on "Elementary Statistics." 7 p.m.

THURSDAY, FRIDAY, and SATURDAY, OCTOBER 3, 4, and 5

Royal Institute of British Architects.—Visit to Glasgow and Annual Dinner. The programme as at present arranged is as follows:—Thursday, October 3 Annual Dinner. Friday, October 4: (1) Lunch in the Exhibition grounds, given by the Glasgow Institute to the Royal Institute visitors. (2) Visit to the Glasgow University (tea). (3) Conversazione given in honour of the Royal Institute by the Corporation of Glasgow. Saturday, October 5: Visits to Exhibition, &c.

FRIDAY, OCTOBER 4.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. J. Wright Clarke on "Details of Plumbers' Work," 7 p.m.

SATURDAY, OCTOBER 5.

British Institute of Certified Carpenters.—Monthly meeting. Mr. W. T. Sweett on "Modern Joinery." 6 p.m.

Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.

Northern Architectural Association.—Visit to Newcastle Breweries' premises, Haymarket, and Electric Power Station, Newcastle.

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Broken Granite	Brentford U.D.C.	Nowell Parr, Clifden House, Boston-road, Brentford	Oct. 1
Sewers, &c.	Bradford-on-Avon U.D.C.	S. Howard, Surveyor, Town Hall, Bradford-on-Avon	do.
Sewerage Works, Bridge and Granville-streets	Dover Town Council	H. E. Stilgoe, Civil Engineer, Town Hall, Dover	do.
House, Cambourne, Cornwall	Mr. J. F. Pearce	J. F. Pearce, Cambourne	do.
Electric Lighting Works	Poplar Borough Council	L. Potts, Council Offices, High-street, Poplar, E.	do.
Wheels and Axles, Switches, &c.	India Office	Director General, India Office, Whitehall, S.W.	do.
Granite (2,500 tons)	Aldershot U.D.C.	N. F. Dennis, Civil Engineer, Aldershot	do.
Laundry, Stanway, Essex	Lexden & Winstree Guardians	G. H. Page, Architect, Trinity Chambers, Colchester	do.
Wood and Granite Paving Blocks and Setts	Great Yarmouth Town Council	J. W. Cockrill, Civil Engineer, Town Hall, Great Yarmouth	do.
Chapel, &c., Caister	do.	do.	do.
Schools, Salisbury-road	Plymouth School Board	H. J. Snell, Architect, 11, The Crescent, Plymouth	do.
Workshops, &c.	Windsor Royal Gaslight Company	J. H. Strange, 2, Victoria-street, Windsor	do.
*Pavilion on New Pier	New Britannia Pier Co., Yarmouth	Mayho & Haley, Amberley House, Norfolk-street, Strand, W.C.	do.
Electricity Buildings	Swindon Corporation	Lacey & Co., Engineers, 2, Queen Anne's-gate, Westminster	Oct. 2
Pumping Machinery, &c., Warning Camp, Sussex	Littlehampton U.D.C.	H. Howard, Engineer, Town Offices, Littlehampton	do.
Drainage Works at Workhouse, Barham, Suffolk	Bosmere & Claydon Guardians	H. Miller, 16, Museum-street, Ipswich	do.
Sinking Well, Hadley-road	Enfield U.D.C.	E. Collins, Surveyor, Court House, Enfield	do.
Electric Cables	Rochdale Corporation	C. C. Atkinson, Borough Engineer, Town Hall, Rochdale	do.
Boundary Walls, &c., Uphill Manor	Weston-super-Mare School Board	H. F. Price, Architect, School Board Offices, Weston-super-Mare	do.
Paving Works, Locking-road	do.	do.	do.
Additions to Workhouse, Barnhill	Glasgow Parish Council	MacWhannel & Rogerson, Archts., 59, West Regent-st., Glasgow	do.
Fire Station and Cottage, Newton-road	Rushden (Northants) U.D.C.	W. B. Madin, Civil Engineer, Vestry Hall, Rushden	do.
*Construction of Sewer	Wimbledon U.D.C.	Engineer, Council Offices, Broadway, Wimbledon	Oct. 3
Steel Girders, Albion-street	Salford Corporation	N. W. Woodward, Engineer, Town Hall, Salford	do.
Road Improvement Works, Bank-street	Castleford U.D.C.	Mr. Green, Surveyor, Castleford	do.
Laying Main (2½ miles) Meerbrook Slough	Ilkeston Town Council	G. & F. W. Hodson, Engineer, Town Hall, Ilkeston	do.
Cement, Sewer Pipes, &c.	Bray (Ireland) U.D.C.	P. MacDonnell, Town Hall, Bray	do.
Steel Girder Bridge, Blackmill, near Bridgend	Ogmore U.D.C.	H. D. Williams, Civil Engineer, Blackmill, nr. Bridgend, S. Wales	do.
*Coastguard Buildings, Bexhill	Admiralty	Coastguard Station, Bexhill	Oct. 4
Walls, &c., at Cemetery	Carrickfergus U.D.C.	W. D. R. Taggart, Civil Engineer, 17A, Donegall-street, Belfast	Oct. 5
Additions to Police Station, Thornaby	Yorkshire County Council	County Surveyor, Northallerton	do.
Sewers, &c.	Bideford Corporation	C. E. Bruges, Civil Engineer, 1, Victoria-st., Westminster, S.W.	do.
*Stables, Cart Shed, Stores, &c.	Camberwell Council	Borough Engineer, Town Hall, Camberwell	Oct. 7
Water Supply Works, Killea	Londonderry Town Council	J. J. S. Barnhill, Civil Engineer, 1A, Strand, Londonderry	do.
Granite Road Metal, Cradley Heath, Staffs	Quarry Bank U.D.C.	A. Homfray, Council Offices, Cradley Heath, Staffs	do.
Mortuary Buildings, Chapel, &c., Stockport-road	Cheadle U.D.C.	G. H. Brady, Architect, 18, Little Underbank, Stockport	do.
*Lighting of School	Ilford School Board	C. J. Dawson, 7, Bank-buildings, Ilford	do.
*Roadmaking and Paving Works	Willesden District Council	O. Claude Robson, Dyne-road, Kilburn, N.W.	Oct. 8
*Granite Setts	Edmonton U.D.C.	G. Eedes Eachus, Town Hall, Lower Edmonton	do.
Superstructure of Electric Lighting Station, Greenhill	Oldham Corporation	A. Andrew, Corporation Offices, Oldham	do.
Additions to Workhouse, Selly Oak	King's Norton Guardians	Mansell & Mansell, Surveyors, Colmore Row, Birmingham	do.
*New Generating Station at Greenhill	Oldham Corp. Electricity Dept.	A. Andrew, Gas and Water Offices, Oldham	do.
Lodge, &c., Longbridge-road	Barking (Essex) U.D.C.	C. F. Dawson, Surveyor, Public Offices, Barking	Oct. 9
*Heating St. James' Church, Wood Green	The Committee	McKenzie, 58H, Hatton-garden, E.C.	Oct. 10
*Erection of School	Farningham School Board	G. H. Tait, Architect, Dartford, Kent	Oct. 12
Town Hall	Cheltenham Corporation	Waller & Son, Architects, 17, College-green, Gloucester	do.
*New Visiting Rooms	Wilts County Asylum	County Surveyor, County Offices, Trowbridge	do.
*Additions, &c., to Workhouse	Berkhampstead Union	C. H. Rew, Architect, Berkhampstead	do.
*Firemen's Cottages, &c.	Beckenham U.D.C.	J. A. Angell, Surveyor, Beckenham	Oct. 14
*Broken Granite	Hanwell U.D.C.	Council Offices, Hanwell, W.	do.
Cattle Market, &c.	Braintree (Essex) U.D.C.	F. Whitmore, Architect, Chelmsford	Oct. 15
*School Buildings, near Croydon	St. Olave's Union	A. H. Newman, Architect, 81, Tooley-street, S.E.	Oct. 17
*Heating and Ventilating, Youghal Lunatic Asylum	Cork District Lunatic Asylum	H. A. Cutler, Municipal Buildings, Cork	Oct. 21
*Town Hall	Cheltenham Corporation	Town Clerk, Municipal Offices, Cheltenham	Oct. 30
House, Shop, &c., Micklegate, Pontefract	Mr. Blackburn	Garside & Pennington, Architects, Ropergate, Pontefract	No date
Business Premises, Market Place, Pontefract		Tennant & Bagley, Architects, Pontefract	do.
Wesleyan Chapel & School, Worsborough Dale, Yorks		G. Moxon, Architect, 26, Church-street, Barnsley	do.
Cast-iron Pipes	Cowes (Isle of Wight) U.D.C.	W. Halliday, 40, High-street, Cowes, Isle of Wight	do.
*Heating of School	Ilford School Board	C. J. Dawson, 7, Bank-buildings, Ilford	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Clerk of Works	County Borough of Salford	34 per week	Sept. 30
*Clerk of Works	Derby Corporation	Not stated	Oct. 1
Engineer and Surveyor	Stoke-upon-Trent Town Council	250*l.* per annum	do.
Surveyor, &c.	Tavistock U.D.C.	Not stated	do.
*Clerk of Works	Walsall Corporation	4*l.* 4*s.* per week	Oct. 5
*General Manager	Camberwell Council	200*l.* per annum	Oct. 7
*Storekeeper	do.	150*l.* per annum	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. —. Contracts, pp. iv. vi. viii. x. & xxiv. Public Appointments, pp. xxi. & xxiv.*

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 13.—By G. B. HILLIARD & SON (at Chelmsford).

Sandon, Essex.—Southlands Farm, 157 a. 3 r. 5 p., f. — £1,010

Great Baddow, Essex.—Bell-st., two freehold cottages — £40

September 14.—By Messrs. SPELMAN (at Norwich).

East Tuddenham, &c, Norfolk.—An occupation farm, 56 a. 1 r. 19 p., f. and c. — 1,000

Freethorpe, Norfolk.—The Lockgate Farm, 74 a. 3 r. 30 p., f. — 1,050

Tofts Monks, &c., Norfolk.—Four grazing marshes, 43 a. 1 r. 27 p., f. — 650

September 16.—By Messrs. KEMSLEY.

Poplar.—449 to 461 (odd), East India Dock-rd., u.t. 72 yrs., g.r. 46*l.* 4*s.*; Bromley-by-Bow.—14 and 16, Abbott-rd., u.t. 72 yrs., g.r. 12*l.*, r. 70*l.*; Canning Town.—127, 129, and 133, Barking rd., u.t. 79½ yrs., g.r. 30*l.*, r. 150*l.* — 3,900

By KING & CHASEMORE.

Slinfold, Sussex.—Part of the Pinkhurst Estate, 89 a. 3 r. 29 p., f. — £1,150

By CASTIGLIONE & GIBBINGS (at Carlisle).

Hayton, Cumberland.—Part of Ash Tree Farm, 41½ a., f. — 1,820

By SEXTON & TAYLOR (at Clare).

Porlingford, Suffolk.—Clopton Hall Farm, 155 a. 2 r. 17 p., f. — 910

September 17.—By C. H. BROWN.

Chelsea.—2, Upcerne-rd., u.t. 66½ yrs., g.r. 6*l.* 16*s.*, e.r. 45*l.* — 350

By COCKETT & HENDERSON.

Wanstead.—Hermon Hill, Elmwood, f., e.r. 70*l.* — 1,200

By WILLIAM WESTON.

Willesden Green.—23 and 29, Rutland Park, u.t. 92 yrs., g.r. 17*l.* 10*s.* — 1,000

By C. P. WHITELEY and GUDGEON & SONS (at Winchester).

Twyford, Hants.—Twyford Lodge and 21 a. 1 r. 14 p., f. — 9,000

The Cottage and 3 r. 27 p., f. — 1,000

Water Farm, 8 a., f. — 1,175

Water Farm House and 1 a. 1 r. 19 p., f. — 1,100

Three freehold meadows, 20 a. (including fishing rights) — £2,625

Beaulieu Cottages and two cottages adjoining, f., r. 46*l.* — 810

Watley Farm, 137 a. 3 r. 34 p., f. — 2,575

By BOYTON, PEGRAM, & BUCKMASTER (at Walham Green).

Fulham.—5 and 7, Goodson-rd., f. — 630

26, Knivet-rd., u.t. 71 yrs., g.r. 5*l.* — 270

By STRAKER & SON (at Abergavenny).

Bryngwyn, &c., Monmouth.—The Bryngwyn estates, 405 a., f. — 9,250

September 18.—By F. PERKS.

Tolleshunt D'Arcy, &c., Essex.—The Guisnes Court Estate, 1,851 a. 0 r. 19 p., f. — 22,600

By BISLEY & SONS.

Bermondsey.—59 to 63, Vienna-rd., u.t. 22 yrs., g.r. 12*l.* 15*s.* 6*d.* — 760

By WM. WESTON (at Paddington).

Bayswater.—25, Burlington-rd., u.t. 58 yrs., g.r. 10*l.* 10*s.* — 500

Maida Hill.—28, Bravington-rd., u.t. 77 yrs., g.r. 7*l.* — 402

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September 19.—By BRIANT & SONS.

Kennington.—56, Royal-rd., u.t. 48 yrs., g.r. 5*l.* 15s., e.r. 34*l.*	£350
By W. F. LAING.	
Hackney.—28 and 30, Groombridge-rd., u.t. 52½ yrs., g.r. 12*l.*, r. 86*l.*	740
By ALEX. PHILLIPS & Co.	
Shepherd's Bush.—52, Godolphin-rd., u.t. 76 yrs., g.r. 7*l.*	280
67, Stowe-rd., u.t. 76 yrs., g.r. 7*l.* 7s.	265
Brondesbury.—11, Callcott-rd., u.t. 82 yrs., g.r. 8*l.* 8s., e.r. 55*l.*	555
Marylebone.—42, Boston-pl., u.t. 19 yrs., g.r. 4*l.* 4s.	165
8, Hereford-st., u.t. 18½ yrs., g.r. 16*l.*	130
18 and 24, Horace-st., f.	560
By SIM & RANDALL.	
St. George's East.—22, Cable-st., f., r. 52*l.*	1,000
Forest Gate.—44, Earlham-grove, f., e.r. 50*l.*	700

Constructions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 14 0	per 1,000 alongside, in river
Rough Stocks and Grizzles	1 11 0	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 8 0	,, ,, ,,
Flettons	1 8 6	,, at railway depôt.
Red Wire Cuts	1 14 6	,, ,, ,,
Best Fareham Red	3 11 0	,, ,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire	4 4 6	,, ,, ,,
Do., Bullnose	4 9 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 2 6	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.
	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	34 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od.		per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath ,,	1 7	,, ,,
Farleigh Down Bath	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,,	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks	2 1½	,, ,,
Red Corsehill ,,	2 5	,, ,,
Red Mansfield ,,	2 4½	,, ,,
Hard York in blocks	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt
,, ,, 6 in. Rubbed Ditto	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt
,, ,, 6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,, 3-in. do.	1	2½ ,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	10 15 0	,, ,,
16×8 best ,,	6 2 6	,, ,,
20×10 best blue Portmadoc	10 18 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green	11 2 6	,, ,,
16×8 ,, ,,	6 15 0	,, ,,
20×10 Permanent green	10 0 0	,, ,,
16×8 ,, ,,	5 12 6	,, ,,

PRICES CURRENT (*Continued*).

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt
Hip and valley tiles	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0	
Deals: best 3 by 9	13 10 0	14 10 0	
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0	
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than best 7 in. and 8 in.	
Deals seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0	
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0	
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.	
½ in.	1 0 0	,,	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks	2 15 0	3 0 0	
Pitch pine timber (35 ft. average)	3 0 0	3 10 0	

JOINERS' WOOD.

	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0	
3 in. by 9 in.	22 0 0	23 0 0	
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0	
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0	
,, ,, 3 in. by 9 in.	18 0 0	19 0 0	
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0	
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
Do. 3 in. by 9 in.	19 0 0	20 0 0	
Battens	14 0 0	15 0 0	
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0	
Do. 3 in. by 9 in.	14 0 0	15 0 0	
Battens	11 10 0	12 0 0	
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0	
Do. 3 in. by 9 in.	13 0 0	13 10 0	
Battens	10 10 0	11 10 0	
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	15 0 0	16 0 0	
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0	
Battens	12 0 0	13 0 0	
Second white deals 3 in. by 11 in.	14 0 0	15 0 0	
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0	
,, ,, battens	10 10 0	11 10 0	
Pitch pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine— First, regular sizes	30 0 0	33 0 0	
Broads (12 in. and up)	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,,	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7	
in. do. do.	0 0 7	- - -	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6	
Prepared Flooring—	Per square		
1 in. by 7 in. yellow, planed and shot	0 13 6	0 16 6	
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6	
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 0	
6 in. at 6d. per square less than 7 in.			
1 in. by 7 in. white, planed and shot	0 11 0	0 13 0	
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6	
1¼ in. by 7 in. white, planed and matched	0 14 0	0 16 6	
6 in. at 6d. per square less than 7 in.			

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders ,, ,,	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 17 6	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 4½	- - -
SOLDER—Plumbers' ,,	0 0 7	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 6	per ton delivered.
Fine ,,	47 6	,, ,,
Superfine ,,	88 6	,, ,,
Coarse Keenes and Parian cement	55 0	,, ,,
Fine do. do.	75 0	,, ,,
Robinson's Fireproof Cement	50 0	,, ,,
Do. Fine white, finishing (Exclusive of the ordinary charge for sacks.	55 0	,, ,,
Whiting	27 0 to 30 0	,, ,,
Cow hair for plastering	£9 0 0	,, ,,

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
,, ,, fourths	2¾d.	,, ,,
21 oz. thirds	3¾d.	,, ,,
,, ,, fourths	3½d.	,, ,,
26 oz. thirds	5d.	,, ,,
,, ,, fourths	4½d.	,, ,,
32 oz. thirds	6d.	,, ,,
,, ,, fourths	5½d.	,, ,,
Fluted sheet, 15 oz.	3½d.	,, ,,
,, ,, 21 ,,	4½d.	,, ,,
½ Hartley's Rolled Plate	3d.	,, ,,
⅝ ,, ,, ,,	3½d.	,, ,,
¾ ,, ,, ,,	4d.	,, ,,

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes	per gallon 0 2 10	
,, ,, ,, in barrels	,, 0 2 11	
,, ,, ,, in drums	,, 0 3 1	
Boiled ,, ,, in pipes	,, 0 3 0	
,, ,, ,, in barrels	,, 0 3 1	
,, ,, ,, in drums	,, 0 3 3	
Turpentine, in barrels	,, 0 2 3	
,, in drums	,, 0 2 5	
Genuine Ground English White Lead	per ton 22 0 0	
Red Lead, Dry	,, 22 10 0	
Best Linseed Oil Putty	per cwt. 0 9 0	
Stockholm Tar	per barrel 1 10 0	

VARNISHES, &c.

	per gallon. £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

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TO CORRESPONDENTS.

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* Denotes *accepted*. † Denotes *provisionally accepted*.

ERITH (Kent).—For the erection of engine and boiler house, &c., for the Urban District Council. Mr. Harold Hurd, Surveyor, Erith U.D. Council. Quantities by Mr. W. Egerton, 12, Queen's-road, Erith :—

Messrs. Radford & Greaves, Derby†	Section L	£3,275	4 4
	,, M	524	9 1
	,, N	292	11 2
	,, O	331	1 7
	,, P	104	8 0
	Total	£4,527	14 2

HARROW.—For the erection and completion of offices, residential flats, and shop premises in the Peterborough-road, Harrow-on-the-Hill, Middlesex. Messrs. Clarke & Charles, architects. Quantities by Mr. H. H. Robinson :—

Hastings & Ladley	£5,542	Gough & Co.	£4,092
T. Turner, Ltd.	4,747	Chinchen & Co., Kensal Green*	3,974
Kimberley	4,695	C. Simmons	3,897
Miskin & Sons	4,632		
Waterman	4,167		

HARROW.—For alterations and additions to the post-office, Harrow-on-the-Hill. Messrs. Cowell & Shaw, architects, 49, Finsbury-pavement and West-street, Harrow :—

Groom & Collins	£589	H. Woodbridge*	£547
A. J. Batcheler	552		

[All of Harrow.]

LUTON.—For the erection of a fire-station, &c., Church-street and St. Mary's-road, for the Town Council. Mr. A. J. L. Evans, Borough Engineer and Surveyor, Town Hall, Luton :—

Thomas Smart	£1,898	W. G. Dunham, Luton*	£1,767
T. & E. Neville	1,797		

NEATH (Wales).—For the erection of a gymnasium, for the County School Governors. Mr. D. M. Jenkins, architect, Gwyn Hall, Neath :—

John Snow, Neath* £795

STANFORD-LE-HOPE (Essex).—For the construction of sewage disposal works for the Orsett Rural District Council. Mr R. F. Grantham, C.E., 23, Northumberland-avenue, London, W.C. :—

Contract No. 3.

Killingback & Co.	£8 038	0	0	Shelbourne & Co.	£6,724	0	0
T. Adams	8,020	0	0	A. T. Catley	6,678	0	0
G. G. Rayner	7,724	0	0	A. & A. Streeter	6,136	0	0
Dowell & Co.	7,647	0	0	Jos. Jackson, Forest Gate*	5,691	19	9
Rogers & Co.	7,540	0	0				
Cooke & Co.	7,076	0	0	Wilson, Border, & Co.	5,197	0	0
W. Manders	6,960	0	0				
G. Osenton	6,852	0	0				

WHITLEY.—For the erection of sewerage works for the Urban District Council. Mr. J. P. Spencer, C.E., 30, Howard-street, North Shields :—

	Section No. 1.			Section No. 2.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.
J. & W. Simpson	8,150	0	0	6,685	0	0	14,835	0	0
G. E. Simpson	6,849	16	8	6,420	0	0	13,269	16	8
W. Dykes	6,831	15	6	5,908	10	0	12,740	5	6
W. & J. Lant	6,719	16	8	4,565	13	11	11,385	10	7
G. Bell	5,348	13	7	4,647	17	2	9,996	10	9
T. & J. McLaren	5,256	14	0	5,591	12	0	10,848	6	0
Hudson & Sons	5,150	0	0	4,486	0	0	9,636	0	0
Walter Craig	5,142	4	8	6,325	14	9	11,467	19	5
Thornton & Co.	4,900	17	7	4,617	18	10	9,518	16	5
W. Carr	4,735	16	10	3,741	9	4	8,477	6	2
J. Thompson	4,295	10	0	4,198	15	9	8,494	5	9
R. & J. Thompson, North Shields	4,049	13	10	3,106	10	3*	7,156	4	1
J. & R. Johnson, Whitley	3,932	3	0*	3,667	18	3	7,600	1	3

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The Builder.

VOL. LXXXI.—No. 3561. OCTOBER 5, 1901.

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Trees and Shrubs in Towns.

THE protest against the proposal to widen Piccadilly was noticeable, among other points, for the regard which was expressed by many persons for the preservation of the trees on the south side of Piccadilly. These particular trees are of no great individual importance, and the affection, one may almost say, with which many of the public regard them appears somewhat exaggerated in view of the neglect and indifference in regard to trees and shrubs in many parts of the Metropolis and in many towns and urban districts all over England. For if the Piccadilly trees are well worthy of preservation—as we believe they are—why do not the public interest themselves more in urging on Local Authorities to increase the number and to show greater care of trees which are already in existence? That there should be this feeling for the Piccadilly trees is not surprising when we remember how country-loving a person the average Englishman is, and how much he prizes a day out of town. But that fact only increases the surprise that more is not done towards beautifying towns by trees, shrubs, and flowers. For undoubtedly nothing does more to increase the charm of cities than the bringing into them as much of the country as is possible, as much of the colour and variety of Nature as is compatible with the artificiality of a town. Yet when we look round London, or indeed any other English town, it is impossible not to be struck with the lost opportunities. We congratulate ourselves on Kensington Gardens and on our parks, sometimes on our squares, but nevertheless there is a conspicuous want of system in the enlargement of Nature in towns. What is done is done too often spasmodically, or is the result rather of individual effort than of corporate determination. Thus it is understood that Sir J. Wolfe Barry has induced the Westminster Town Council to consider the desirability of planting trees in Whitehall and Parliament-street. Here we have probably the result of individual effort in regard to a particular thoroughfare. But, by way of example, let us suppose Parliament-street and Whitehall planted with trees. At the top of this thoroughfare we arrive at Trafalgar-square, which long ago might have been made infinitely more attractive by systematic planting of trees; room for beds of shrubs and of flowers might also have been found, bringing colour and beauty into a singularly bare space. Let us follow our walk, and we come to Waterloo-place, the portion of which between the Guards' Memorial and the Duke of York's Column might long ago have been a mass of greenery—an offshoot, as it were, of the Mall and of St. James's Park. Portland-place, again—we take only some of the most obvious instances—stands a perpetual reminder of the neglect which is apparent in London of the opportunities of beautifying it systematically, of making the most of the opportunities which occur. What is needed is not irregular individual effort, but a combined and continuous determination by Local Authorities to make the most of such spaces as are capable of supporting the growth either of trees, flowers, or shrubs. A tree once planted will take care of itself. Artificial lopping of limbs such as has disfigured the planes on the Embankment is greatly to be deprecated. In regard to these particular trees, we would urge on the Authorities the necessity during the coming winter of completing the thinning of these trees by the removal of every other tree, as has been done at the west end of the Embankment. The dwarfed intermediate trees overpowered by their fellows ought never to have been planted at all, and ought to be removed as soon as possible.

But, apart from trees, a great deal more might be done with shrubs, which need less space than timber trees. In this respect, almost every square in London is an example of lost opportunities. Perhaps the most glaring example is St. James's-square, which is surrounded with a dense and ugly thicket of lilac, which never flowers, and which hides the picturesque timber and green sward in the centre. It is high time, indeed, that St. James's-square was handed over to the Local Authority for public use. It has ceased almost entirely to be a residential square; but if these bushes were removed and it were made a public place, it would be used as an agreeable lounge by many from the whole district around, and it could be made bright with flowers, as parts of St. James's Park now are. Indeed, if we examine the London squares, nothing is more noticeable than the want of colour. Of course, brilliant flowers will not flourish under spreading trees, but there are plenty of openings and spaces which a skilful gardener would utilise. But, taking them as a whole, nothing whatever is done. It would be easy to find places in every square in London where a tub of agapanthus could be placed in the summer, the striking blue flowers of which are in bloom from July to September, and which needs only to be removed to an outhouse or cellar in the winter. We give this as one instance only, but any one acquainted with flowers and shrubs can find in every square in London lost opportunities, more especially in regard to coloured shrubs. Where are the purple Prunus Pissardi, the most hardy of shrubs, the variegated maples, the various species of berberis, the golden yew, and others of equal beauty, to be seen in London?

So far as squares are concerned, this neglect of opportunities is quite remarkable, for many of the householders who have an actual interest in the square gardens are lovers of flowers, and sometimes possess country houses. Yet they are satisfied to allow the square gardens to be treated with neglect in an age when booksellers' shops are filled with works on gardens and on flowers, and when every publisher has one or more works on this subject on his list. Why some of these good people who are constantly giving us their experiences of Surrey gardens, or a year's work here or there, do not endeavour to improve the appearance of London horticulturally is really astonishing. There is the dreary courtyard of Burlington House; the centre might quite well have a small fountain filled with lilies, and around it a little plot of green with some well-tended shrubs and bright flowers. Instances multiply themselves on every hand. London can architecturally never hope to compete with cities such as Paris or Berlin, but, retaining those particular characteristics which give it a unique charm, it might become even more beautiful were the authorities and inhabitants to make up their minds not only to utilise every space which is available for the growth of trees, flowers, and shrubs, but to have them tended

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not only with care, but also with intelligence. Every Local Authority, as well as the Office of Works, might have an advisory committee of specialists to suggest and to report not only on desirable horticultural improvements, but on the management of existing trees, shrubs, and flowers. Some disappointment in homes there must be with trees and shrubs, since the atmosphere of the Metropolis is certainly injurious to many plants. But we have only to look at Kensington Gardens, St. James's Park, and Regent's Park to see what is possible of accomplishment, for on a smaller scale everything that is carried out in those places is possible in any London square. And even in these parks the horticulturist is constantly struck with opportunities not seized and with the absence of new shrubs. But when he leaves them he is generally thankful that the cultivation of trees, and flowers, and shrubs is as satisfactory in these places as it is, when he perceives the complete absence of colour in many parts of London, where summer and winter are alike unmarked by the beauty of plant life.

THE ARCHITECTURAL TREATMENT OF BRIDGES.

By the Editor.

THE illustrations in this issue of the *Builder* are all of bridge designs —two by architects and one by an engineer; and have been purposely combined in one issue in order to afford an opportunity for a few words in regard to the treatment of bridges from an architectural point of view; in other words, the degree and the manner in which, after the purely structural requirements have been worked out, a bridge may be further regarded and treated as a work of art, susceptible of architectural effect and embellishment.

The subject has been brought prominently into notice recently, firstly by the peculiarly unfortunate æsthetic mistakes which were made in the case of the Tower Bridge, and which have converted what might have been a grand and effective structure into a piece of architectural gimcrack; secondly, by the controversy which arose in regard to the exceedingly awkward and ill-conceived architectural design proposed by the Engineer of the London County Council for the granite facing of Vauxhall Bridge; thirdly, and in a much more agreeable and satisfactory manner, by the admirable paper read by Mr. J. Husband before the Institution of Civil Engineers, in March of this year, on "The Æsthetic Treatment of Bridge Structures;" a paper which, though one may not agree in detail with all the views expressed in it, can only be regarded as an honour to the author of it and to the Institution of which he is an Associate member, and which has certainly tended to definitely advance the study of the subject. Moreover, the association of a good many architects, kindly invited by the Institution, in the discussion of the paper, has we may hope done something to break down the wall of partition or misunderstanding between engineers and architects, and to convince the former that architects really have something to say on the subject, and some right to a *locus standi* in connexion with it; and it is probable that we shall not again hear indignant complaints from engineers that the proposal to associate an architect with them in the design of a large bridge is of the nature of an insult to them. Indeed, it would seem that even the stubborn hearts of the London County Council have been somewhat melted within them on this point; for while they have persistently refused to call in the aid of an architect in the treatment of Vauxhall Bridge, on the futile and illogical ground aforesaid, that it would hurt the feelings of their engineer (a consideration which they apparently put before the proper carrying out of a great public work), it seems to be pretty well understood that on the next occasion of the kind the assistance of an architect will be sought—at all events where it is intended to develop a bridge beyond the phase of bare constructional requirements, in which case alone the work gets out of the proper province of the engineer.

The question, however, where does engineering end and architecture begin, in the case of a bridge—and the correlated question, where is the line of demarcation between the province of the engineer and the architect, is not such a very easy one to settle; it seems indeed to call for a kind of æsthetic application, if one may so say, of differential calculus. The words "architectural effect *or* embellishment," a few lines above, were not used without purpose. There may be architectural effect without any embellishment; effect arising solely out of line and mass, and in which decoration has little or no place; such effect as we see in London Bridge for instance, and in some of the plainer and sterner examples of Norman and Transitional architecture. In the case of a built bridge of stone or granite, this effect may be arrived at without going beyond the best structural requirement; in other words, without going out of the engineer's province. The best lines of structure, in such a case, will often produce also the best effect. As soon as the element of embellishment or decoration comes in, however, we are purely in the architect's province. An engineer's education does nothing for him in training the eye and taste in architectural decoration; his faculty of design, in the artistic sense, has never been cultivated, and the probability is that he appropriates stock features out of architectural books, treats them clumsily and misapplies them so as to be absurd and unmeaning. On the other hand, if we go back to the early stages of the structure—the preparation of the foundations in deep water, it is equally certain that here we are on ground which is peculiarly the engineer's, and for which the usual education and experience of the architect have not prepared him. We may say, then, that there are three stages in bridge building on a large scale and in a sumptuous manner: the preparation of the foundations and the inner structure of the piers, which is purely engieeering work; the decorative embellishment, which is purely architectural work; and an intermediate stage which, according to circumstances, might be handled either by engineer or architect, but which (we may add) will be in general the better for the collaboration of the two.

The case of the Vauxhall Bridge affords an apt illustration of this latter point. In this case the wide flat segmental arch, starting abruptly from the piers and as if jammed between them, has anything but a good effect. But we are told that these lines are almost absolutely settled by practical conditions. The piers were, by the requirements of the Thames Conservancy, to have so much waterway between them; the crown of the arch was to give so much headway above the water level: on the other hand, by the requirements of the shore authority (the County Council) the gradient of the roadway was limited to a certain minimum of rise. Obviously under such conditions there is very little margin left to the constructor, and it is not surprising that a steel bridge was at first proposed as the only solution. There was a considerable public feeling, however, in favour of a granite bridge; but no engineer, or architect either, would have recommended the erection of an arched masonry bridge of so great a span on such flat lines. Then came the *via media* of a concrete arch, so-called, which is really rather a couple of huge cantilevers than an arch; which can be safely constructed on the lines required by the authorities, and which could be faced with granite so as to give the effect of a monumental bridge of that material. This was apparently quite satisfactory to the County Council's engineer; but from an architect's point of view the result is this, that an apparently granite arched bridge is designed on lines which would not be employed if it were really of that construction, and of which consequently the effect is unsatisfactory to the eye. And here comes in the point at which the presence and influence of an architect in this intermediate stage would have been of value. In the first place, an architectural coadjutor would never have passed or permitted such clumsy and vulgar details as were shown in the engineer's design (whether or how far they are to be modified in accordance with the criticisms that have been passed on them I know not); in the second place, he would certainly have put the question whether these lines and proportions of construction proposed were really so necessary and inevitable as was pretended. Engineers wanting to build ugly things are so fond of professing that whether you like it or not, they cannot help it; that the proportions are fixed by circumstances or authority; and so on. An architectural adviser could and probably would have put the question —is it really necessary to have so wide a span between the piers, spoiling the proportions of the bridge by so flat an arch? Is not this extreme width a somewhat imaginary necessity, and is it not worth while to give up something of space for the sake of a finer structure? An argument of that kind, strongly pressed, might perhaps have been met by a relaxation of the conditions which are supposed to have been so imperative, and by an admission that something must be conceded on both sides; but there was no one to do it. Did such a case occur in France, the architect commissioned along with the engineer would almost certainly have put that argument; and what is more, *he would have been listened to.* In France such considerations have weight. In England it is a fixed idea, in regard to engineering structures, that the practical considerations are everything, and that no argument in regard to architectural appearance is of any consequence at all.

Thus it comes about that we are having a bridge erected which, while on the face of it it is to appear as a masonry structure, is not

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structurally such, and is designed on lines which, on so large a scale, are unsuitable and insecure-looking for such an apparent structure. Regarded as such, it is too flat in its lines and too weak in its crown. No treatment could really make it satisfactory. What is suggested in the design published in this issue is such a treatment as would minimise the appearance of weight in the masonry, and give the greatest possible apparent depth in the crown. The manner in which this has been arrived at is pointed out more in detail in the explanatory article under the head of "Illustrations," and need not be recapitulated here. What is important to note, however, is that if the system of concrete hinged arches, or cantilevers, with a granite facing, is to be accepted as a favoured form of bridge-building in the future, it is necessary that a treatment of facing granite should be adopted suitable and expressive of the circumstances, and totally distinct from that which is suitable when the bridge is really a monumental and homogenous structure of stone or granite. In the latter case, the more powerful and massive the face design is the better, as in the fine examples of London Bridge and Waterloo Bridge. In the former case, a lighter and perfectly different treatment is required, to express the true function of a facing which is a *revêtement* and not an essential element of the construction.

It would be worth while, perhaps, to take into consideration the possibility of a satisfactory surface treatment of the concrete itself, without any masonry facing; and let a concrete bridge, if that construction be decided upon, appear frankly as such, with a cement treatment on the face of it. Such a bridge could never have the imposing appearance of a masonry bridge, and it is not likely it would ever be adopted except where circumstances of site or a rigid necessity for economy demanded it; but there would be a certain merit in frankly accepting the concrete bridge and making the best of it.

Coming back to solid granite or masonry bridges, however, which after all are likely to keep the field more or less (for they certainly make the finest and most monumental class of bridge structures), the points which seem most to require attention are the face of the main piers, and the spandrels of the arches. There has been a great prevalence of the use of columnar orders on the face of the piers, in the shape of engaged columns or pilasters. This is really a misuse of such a feature, as Mr. Husband did not fail to point out in his paper. There has been a feeling that something must be done at that point in the way of architectural or decorative treatment, and the column has been seized upon, as it has in many more purely architectural structures, because *something* is wanted, and that is a historic feature which comes readiest to hand. Rennie avoided it in London Bridge, but adopted it in Waterloo Bridge; and it must be admitted that there is something very fine in those great, plain, severe columns which stand in couples on the Waterloo piers. Architectural logic, however, must rule that they are out of place there, even more than on the screen wall of a building. The pier has to have the effect of lateral strength; there is nothing of any consequence to support above it; and a feature which expresses resistance to vertical weight is out of place. What we want is something of the suggestion of a buttressing mass; not applied to the face of the pier, but resulting from the shape and design of the pier itself. This is what is attempted, in a new form, in the study published in this issue.

Then, in a bridge on a large scale, the spandrels of the arch offer a considerable space which may or may not be specially treated. Panelling, as noted by Mr. Husband, has been resorted to, but it is a weak expedient, and suggestive of a structure other than masonic. In a bridge of a severe type, perhaps nothing is better than to leave the lines of the masonry, more or less emphasised by rustication. If it is desired to fill in or diversify this blank space, it would seem that here we may rightly apply something of the nature of a surface decoration; either a bas-relief where the bridge is a comparatively small one, or a heraldic device, or a bust in a medallion. It depends to some extent on the amount of decorative treatment admitted in other portions of the bridge, whether we should leave the spandrels as plain masonry, or relieve the space with a decorative feature. In the case of the design published in this issue, where the voussoir lines (for a reason noted under the head of "Illustrations") are carried up to the corbel-table under the balustrade, the longer lines in the haunches of the arch are too insistent and require something to break them; hence the heraldic escutcheons and wreaths, æsthetically of the nature of an applied ornament, but of course in reality carved out of projections left in the solid stone. In this case the spandrel, in the usual sense, has disappeared; the facing is, so to speak, all voussoir, and the decoration does not follow but breaks their lines. So it would be also in the case of a bridge with spandrels of masonry in horizontal or nearly horizontal courses, above a strongly marked system of voussoirs.

Then there is the question of a cornice. Here again we should recognise a distinction between the solid and veritable masonry bridge, and the bridge which is a concrete structure with a mere facing of masonry. In this latter case a heavy cornice of great projection is out of place; it is emphasising too much and placing too much weight on what is only a decorative facing. But in a solid masonry bridge a powerful cornice is a fine source of effect; only, in introducing it, we must remember that we are not dealing, as in an ordinary building, with a true horizontal line; unless in such a case as Waterloo Bridge, where the approach is artificially built up (on the south side) in order to leave the bridge its unbroken horizontal line. This produces a grand effect as far as the bridge itself is concerned, but it was hardly justifiable to deliberately construct a heavy gradient approach in order to obtain the effect, and it is not a process likely to be repeated. Where the bank level is not very high, and a certain minimum of headway is required above the water level, a bridge will always have to assume a certain degree of slope and curvature of line on either side of the crown. In that case the cornice becomes a raking cornice, and it is essential that it should be stopped by the piers, not made to break round them, because such a break cannot be properly constructed; either the cornice must rake round the vertical feature (whatever it is) of the pier, which has the worst possible effect, or it must stop on the further side and begin again at a slightly lower level; an arrangement which cannot be worked at all. That was one of the worst faults of detail in the engineer's original design for Vauxhall Bridge, published in our plates a year or two ago; the large cornice was supposed to be carried in a continuous line round a great circular column on the pier, and resumed on the other side. Such an arrangement could only be worked by "fudging" the mouldings.

One of the besetting sins in the treatment of bridges is to entertain the idea of harmonising them with the environment by adopting some kind of feature belonging to another age; as in the case of the Tower Bridge, which was "Gothicked" (after a fashion), from an absurd idea that this was necessary in order to harmonise it with the neighbourhood of the Tower. It is to be feared that the right lesson in this respect is still unlearned, for one has heard threats that the new Lambeth Bridge is to be made Gothic, to "harmonise" with the Houses of Parliament. Hamerton pointed out the fallacy of this idea in the case of the Conway tubular bridge, where the towers were battlemented in consequence of the proximity of Conway Castle; and Mr. Husband, in replying to the discussion which followed his paper, rather defended this on the ground that there were circumstances in which bridges might be required to be fortified. Very well; in that case fortify them in a modern manner, by a revolving turret or an earth bastion with a disappearing gun; but do not suggest, in a modern bridge approach, a mode of fortification which is centuries out of date. Tricks of this kind only spoil a design. Mr. Husband rightly praised the general design of the Grünenthal bridge, which formed one of the illustrations to his paper; but that bridge, a very fine and picturesque example of modern steel structure, is spoiled by its absurd castellated towers at each end, which look as if they had come out of a toy box of bricks.

In the case of steel bridges attempts at ornamentation have hitherto almost always been bad, and are moreover little required if the lines of the structure itself are good. If they are, it will be a gratification to the eye; if they are not, gilding and rosettes and ornamental rivet heads, and such gauds, will only make it worse. Good lines of structure in steel work, candidly shown, can never be offensive to the taste, and render the structure an object of interest at all events to those who understand construction. Nearly all the valid objections that architects and artists often make to the works of engineers' steel structures arise not on account of the structure, but on account of the ill-judged attempts to make it what is called "ornamental." In this respect the small bridge at Breamore, designed by the County Surveyor of Hampshire, and illustrated in this issue, is a very good example of the sensible and unaffected treatment of a work of this kind. The work is perfectly plain; the only bit of what may be called ornamental treatment in it, the scroll terminations to the stiffeners, gives them some additional strength and is a natural and suitable way of treating the extremities of a piece of steel in this position. The brick piers are quite unadorned

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and merely serve their constructive purpose. But there is nothing here that is in bad taste; it is a perfectly satisfactory piece of work, and a good example, though on a small scale, of the right spirit in which to treat steel bridge structures.

NOTES.

The Co-operation of Architects and Engineers.

Within the last few years the increasing application of machinery and engineering appliances in buildings of all kinds—to say nothing of structural steelwork—has added considerably to the responsibilities of the architect. Sooner or later serious attention must, undoubtedly, be devoted to this matter, for it cannot be said that its present position is at all satisfactory. On every hand we find that private houses, blocks of flats, office buildings, warehouses and public institutions of various kinds are being erected and equipped, under the direction of architects, with electrical and mechanical appliances and machinery, the design and installation of which properly demands years of training and practical experience. Very few architects claim the possession of these qualifications, yet it is rare to find any who decline to undertake such work. Sometimes a consulting engineer is called in to advise the architect privately, but, as a general rule, the manufacturing or contracting engineer has the privilege of furnishing technical information, not only without payment, but without any assurance that he will secure the work in question. It would be unreasonable to blame architects for this state of things, as we believe clients to be entirely at fault. They expect the architect to be a sort of universal expert, and are not willing to run the risk of paying for co-operative advice and superintendence. A similar condition has already evidenced itself in the United States, and has been under consideration by the American Institute of Architects. In a report made by that body, after a conference with a Committee of the American Society of Heating and Ventilating Engineers, and engineers interested in various specialties, the recommendation was made that the scheduled charges of the Institute should be so amended that the minimum fee of the architect for those parts of the work involving electrical, mechanical, and sanitary engineering, heating and ventilation, should be 10 per cent. of the cost, and that the architect should select engineering experts who should render their services under his supervision. An arrangement of this kind appears to provide reasonably for the interests and the co-operation of both professions, and the advisability of similar action might well be considered by our own Institute in conjunction with the leading engineering institutions.

American Institute of Architects.

The thirty-fifth annual convention of the American Institute was announced to be opened this week at Buffalo, New York State, on the 3rd, 4th, and 5th inst. The Reports of a number of Standing Committees form a large portion of the business. Friday was to be entirely occupied by a series of papers in reference to the Pan-American and other Exhibitions (or "Expositions," as the Americans prefer to call them, we suppose because "exposition" is the French word), with the object of considering the best manner of arranging and designing such exhibitions, and providing for lighting, decorative effect, &c. In the main the subjects discussed seem hardly to be of the usual interest from the higher architectural point of view.

St. Séverin, Paris.

It is sometimes noticeable that while the French give much thought to the propriety of new buildings, they are not always so careful as they might be to make the most of ancient buildings. It is satisfactory, therefore, to note the clearance of the miserable houses which have obscured the east end of the Church of St. Séverin in Paris. Already a space at the south corner is cleared, and it is interesting to see how at some period—not, perhaps, so very remote—domestic buildings of the most common kind and apparently of the most temporary description have been fastened against the church, shutting out the windows and the whole of the east end. It is very much to be desired in the interests of architecture that a clearance should be made of the domestic buildings which are to be found attached to cathedrals and churches in many of the French provincial towns, for it has to be borne in mind that they are constantly a source of danger by fire. However, we may be thankful when a clearance takes place as in the case of St. Séverin. Not that the space around should be so large as to give churches the appearance of mere monuments, for it is far more suggestive to find buildings in the position in which their builders intended they should be. But houses built against the church windows are obviously a pure barbarity.

Sanitary Aid Committees.

The creation of a voluntary association in Birmingham, under the name of the "Sanitary Aid Committee," appears to be in many ways more important to the country generally than to Birmingham, which has always had a foremost place in active municipal life. This committee appears to have as its object to act as a kind of independent aid to the regular sanitary authority, and to enlighten the community in regard to sanitary matters. Persons of common aims, working together, can do much more than by individual action, and if in other districts a few persons interested in the improvement of sanitation were to combine they could effect much. There is, in the first place, the necessity of calling the attention of sanitary authorities to the performance of their duties. There are various associations in existence for the protection of commons and rights of way. Where one of these bodies finds an assumed right of way interrupted it brings the matter before the proper authority, and any number of public rights have been thus preserved. The same kind of action in regard to sanitary matters both in towns and in rural districts might have equally valuable results. Good work could also be accomplished by the spread of information, the giving of lectures in schools and in clubs. Altogether we hope that in other places besides Birmingham Sanitary Aid Committees will be established.

Sewage Purification in Manchester.

A recent Report of the Rivers Committee of the Manchester Corporation was discussed at the meeting of the Council last week. The discussion is interesting as showing what use is already being made of the last Report on sewage-purification issued by the London County Council. About two months ago we pointed out the unsatisfactory nature of the processes and apparatus adopted in these tests, and our view was confirmed a week later by Mr. Scott-Moncrieff, but one of the Manchester Councillors has evidently accepted the conclusions of this Report as entirely applicable to any and every process of bacterial purification, and quoted them in proof of his statement that "to attempt to treat sewage by the bacteriological system without the use of chemicals would be an absolute failure." Dr. Dreyfus, the vice-chairman of the Committee, characterised the statement as "false," but, at the request of the Lord Mayor, withdrew this unparliamentary adjective and substituted the words "most inaccurate." Of course, no one goes so far as to say that bacteriolysis effects an absolute purification of sewage in the short time which can be allowed in the treatment of sewage, but even such a statement would be less erroneous than a wholesale condemation of the process.

Petrified Oak in Russia.

A correspondent sends us an interesting account of some remarkable deposits of petrified wood existing in one of the rivers of South Russia. The deposit consists of a quantity of calcined oak lying in the bed of the river in layers three or four deep, and extending over an area of some 150 miles. A main feature—which, indeed, constitutes the chief value of this specific hardwood—is its variety of colours. No fewer than twelve shades in pink, blue, yellow, and that known as American walnut have been found. This peculiar formation would seem to have been caused by the variegated character of the soil at the bottom of the river. How long Nature has taken to achieve this feat is a question to be solved by geologists. Some six years back a Russian timber merchant purchased a twelve years' lease of the deposits and determined to exploit them. During the six years of his tenancy, already expired, he has nearly doubled the sum of his original outlay, and this with only very primitive methods of exploitation, viz., manual labour with boat-hooks. The excavated timber is in logs of from 42 ft. to 200 ft. in length by 15 in. to 20 in. in diameter, and each log is of one uniform shade throughout. The transit to St. Petersburg or Riga from the locality of the deposit is comparatively cheap, viâ Russia's main waterway, the river Volga, and the present leaseholder estimates the deposit as being still capable of yielding from 150,000 to 200,000 good, sound logs of an average length of 70 ft. In the face of the present controversy on the relative values of American timber compared with Australian hardwoods for certain purposes, it would be interesting to know the opinion of the trade upon this Russian deposit of hardwood. It would be still more interesting, from a geological standpoint, to discover whether similar deposits have been known to exist in other parts of the world. That the hardwood may be turned to practical use is evident from the experience of the above-mentioned trader.

The Capetown Cathedral.

In a recent issue *South Africa* publishes the ground plan of the intended cathedral at Capetown (the foundation-stone of which was

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laid in August by the Duke of Cornwall), and gives some particulars but not the name of the architect. From the plan, the building is evidently intended to be Gothic in character. On the south side of the plan there is a cloister court, not however against the south wall of the nave, but (as at Chichester) abutting against nave and choir walls, and enclosing the front of the south transept as one side of the cloister garth. The modern uses of the cathedral are indicated in the titles of the rooms opening out of the cloister, which consist of classrooms, cloakrooms, lavatories and offices. All this appears to us quite in accordance with the principle of rendering the cathedral of practical use for its neighbourhood, though we suppose some ecclesiologists will be shocked at what they will consider a kind of profaning of the sacred precinct. The chapter-house, rectangular in form, opens at the east end of the south cloister walk. It is intended, if possible, to use entirely stone found in the colony, in the erection of the building. Table Mountain sandstone is proposed for the exterior; and for the interior, stone from Stormberg, Steenpan, or Bulawayo, the last-named being said to be the best stone in the colony.

Holy Trinity New Church, Kensington.

WE understand that Mr. G. F. Bodley has been appointed architect of the new church which, together with a parsonage house, is about to be built in Prince Consort-road, South Kensington, upon a site (in the parish of St. Stephen) which the Commissioners for the Exhibition of 1851 offered for sale. To the cost of the new church will be applied the proceeds of the sale of the site and materials of Holy Trinity Church, Park-side, Knightsbridge, built in 1860-1 by Messrs. Dove Brothers, at a cost of 3,250*l.*, from the designs of R. Brandon and H. M. Eyton, and illustrated in the *Builder* of April 21, 1860. A scheme recently made by the Ecclesiastical Commissioners provides for a union of the two contiguous benefices of All Saints' and Holy Trinity, Knightsbridge, and for the demolition of the church of the latter vicarage. The Commissioners ordain that the united benefice shall be served by All Saints' Church, which was erected fifty years ago (and subsequently enlarged) in Ennismore Gardens from the designs of Lewis Vulliamy. The interior was decorated by Owen Jones.

No. 19, Old Jewry.

A FEW days ago the National Debt Commissioners removed their offices to Finsbury Pavement House from No. 19, Old Jewry, and the demolition of their former premises in Old Jewry is now in progress for a rebuilding by Messrs. W. Cubitt & Co. The house was designed by Soane in 1818-9, for purposes of the National Debt Redemption and Life Annuities business, and completed the block for which Soane had designed in 1808-10 the five houses known as New Bank-buildings* in Prince's-street, which he widened and straightened, taking some of the recovered ground for his enlargement of the Bank of England. In the Soane Museum is preserved a set of plans signed by him, and entitled "The Five Houses in Prince's-street called 'New Bank Buildings,' erected 1807-10 upon ground recently bought by the Bank of England." The ground was acquired from the Grocers' Company, who received 20,000*l.* as compensation. In the same collection are some sets of varying designs for the complementary premises—No. 19, Old Jewry. On the ground floor of the National Debt Offices was a large open chamber, lighted by a drum and cupola carried upon four arches, which Soane designates as the "cenotaph and place for paying English and Irish Tontines," and especially designed for Westmacott's seated statue of William Pitt, a gift of the Bank Directorate to the National Debt Commissioners: a wooden model of the "cenotaph" is in the Soane Museum. The plans we mention show the sites of the Grocers' (old) Hall and garden; and of the old Meeting House, Meeting House (formerly Windmill) court, and almshouses in Old Jewry. No. 19 and the open space in the rear occupy the site of the almshouses, the Meeting House, and three other messuages, which together constituted the Morys trust property as sold for 10,000*l.* to the Governors and Company of the Bank of England by the Armourers' Company. Soane also designed (1811) Thellussons' banking-house in Meeting House-court. The almshouses, now quite forgotten, had been founded there with a bequest in 1551 to the Armourers and Braziers from Dame Elizabeth Morys of all her lands and tenements in St. Olave, Jewry, parish under charitable trusts. Mr. A. C. Blomfield's designs for the rebuilding of Bank-buildings were at the Royal Academy Exhibition of the current year.

* Not to be confused with (old) Bank-buildings, built after Sir Robert Taylor's designs and pulled down in 1843, which stood at the west end of Threadneedle-street, south side.

The word "Renaissance."

WE observe that the printed prospectus of lectures on architecture and construction at University College contains the announcement of a course of lectures on the architecture of the "Rénaissance." It is not a misprint, for it recurs six times in the paragraph. Of course it is generally understood that University College is an institution for instruction in science rather than in literature; but still we should have hoped that some one connected with the issue of the prospectuses would have been aware that there is no accent over the first syllable of "Renaissance." Such mistakes do not look well in the printed circulars of an important teaching body.

SOME PRIMARY CAUSES OF EXPANSION AND CONTRACTION IN PORTLAND CEMENT CONCRETES AND MORTARS.

BY H. HOWARD HUMPHREYS, A.M.INST.C.E.

THE extraordinary "boom" which set in some five or six years ago in the building trades, for which the buoyant commercial condition consequent upon prolonged peace amongst the great manufacturing nations of Europe was chiefly, though not entirely, responsible, has had a curious, and to some extent a paradoxical, effect on the general use of Portland cement. The cause of the boom in this country was doubtless materially assisted by the fact that several large engineering and building works had started about the same time, and an artificial scarcity of cement was created, with the usual result that the price of the material was very shortly inversely as the supply. Then appeared the paradox; for as soon as the fact had been carefully advertised that manufacturers could not cope with the demands made upon their works by consumers, many engineers and architects who had hitherto taken little notice of cement began to attribute an excellence to it, as a constructional material, to which they had previously been blind, and to specify it where they had formerly used either hydraulic or common lime. An internal boom, due to what may be called secondary excitation, therefore occurred, and this at the present time is largely responsible for the fact that the storage sheds of the best manufacturers show but little stock.

Deplorable as are some of the transient fashions of the building trades, in this particular instance the supersession of the feebly hydraulic limes by Portland cement makes wholly for good, as it assists constructional men in arriving at the goals of stability and durability. Unfortunately, however, cement is a highly complex and apparently capricious material, which sometimes develops disintegration where cohesion was reasonably expected, and disgusts those who would have been its best friends were it more constant in its attachment. This is especially so in the matter of its volume, which certainly should be permanent, except so far as regards expansion and contraction due to atmospheric causes, and which it is extremely difficult, if not impossible, to entirely neutralise. It is obvious that if concrete or mortar expands after taking its initial set it will cause movement and distortion, destroying the homogeneity of the structure upon which it has been used, or, in the case of floors, pushing the main walls of the building out and causing endless damage to cross walls, and disturbance and secondary stresses in floor girders. What, then, are the causes which lead to such troublesome results? They may be classified under two heads:—

1st. Disruptive stresses due to internal movement in the cement.

2nd. Disintegrating atmospheric conditions.

Heading No. 1 can be split up, and the responsibility for the elimination of the expansions and contractions can be divided between the manufacturer and user thus:—

A.—Causes of Internal Expansions and Contractions over which the Manufacturer has Primary Control.

1. Due to unscientific proportioning of raw materials leading to either over-liming or over-claying.
2. Insufficient burning, resulting in the presence of loosely combined caustic lime in the cement.
3. Excessive quantities of chemical impurities, as magnesia and sulphuric acid.
4. The presence of artificial impurities, such as slag and gypsum.
5. Bad milling, resulting in a partially pulverised clinker.

B.—Internal and External Causes over which the User has Control.

6. The use of new and unaërated cement.
7. The use of mortars, principally for purposes of rendering, which contain too high a proportion of cement.

It will now be useful to examine each of these causes in detail, and to see how far they bear on the phenomena of expansion and contraction.

1. *The Unscientific Proportioning of Raw Materials, Resulting in Over-Liming or Over-Claying.*—It must be remembered that Portland cement is a chemical compound formed from the calcination of a mechanical mixture of some kind of lime and clay. In order to get the best results so far as rapid hardening and permanence of volume are concerned, the lime must be in such a proportion to the clay that it can enter into complete combination with the silica and alumina of which the latter mainly consists. Dr. Spencer Newberry found experimentally that the limit of the molecules of lime to those of the soluble silica in the clay is as 3 to 1, and in the same way the proportion of lime to alumina should not exceed 2 to 1. From the atomic weights we find that these proportions will represent *in weight* 2·8 parts of lime to combine with 1 part of silica, and 1·1 of lime to combine with 1 part of alumina. Supposing that these proportions are departed from to an appreciable extent, it will then be seen that the best compounds, viz., tri-silicate and di-aluminate, will not be obtained, as there will either be a surplus of imperfectly combined lime present in the cement, or the alumina will be in excess; in either of these events an alteration of volume is almost certain to occur, especially if the slurry has been over-limed and the clinker highly fired, for lime burnt at a high temperature slakes more slowly than that which has been subjected to a moderate heat, and consequently signs of expansion from the hydration of the quicklime (often concealed in the coarser particles of ground cement) do not occur sometimes for

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months after the concrete has set. It is essential that a constant check shall be kept on the proportioning not only of the lime to the clay by means of the calcimeter, but also to the character of the clay itself, to determine mainly the relative proportions of silica and alumina present in it, in order that the lime may be added according to a sliding scale.

At the present time the tendency with many users of cement is to raise the tensile requirements for the week's test. This frequently results in manufacturers over-liming. Subsequent expansion (due to the causes above mentioned) disturbs the initial cohesion, with the natural result that very frequently the stress borne at twenty-eight days is actually 30 per cent. lower than that carried in a week.

2. *Insufficient Burning.*—The comparative expensiveness of coke during the last few years has tended towards too great an economy of fuel, thus leaving a considerable quantity of "pinks" or under-burnt clinker in the kiln. In this material the lime is not properly combined with the other constituents, and the consequence is that there is also present in it a considerable amount of lime which is a source of danger, but not of so great a danger as is the lime of a hard-burnt and over-limed cement, for the cements which are imperfectly calcined are naturally easier to grind, and consequently the loosely combined lime, being better exposed, will frequently pass through the whole of the dangerous stages of expansion if it has been exposed to the air for a short time on the floor of a cooling shed. Considerable danger, however, exists where a very under-burnt material is used, as shrinkage almost invariably occurs in the work.

It is, however, fairly easy to detect the under-burnt cement, as when fresh from the kiln it has a low specific gravity and a brownish colour, instead of the hard grey tint which is generally an indication of a proper degree of calcination. In cases where doubt exists it is useful as a test to mix a sample of cement with about 25 per cent. of water, pressing the mixture into a test tube with a small cylindrical rammer, the effect of which is to bring the lighter —*i.e.*, the under-burnt particles—to the top of the tube, where they form a layer sometimes ½ in. deep on a total depth of about 4 in. This top stratum sets with great rapidity, and in the course of two or three days shows a ring of a comparatively light chocolate colour. Such cements are not *necessarily* dangerous, but they most certainly require a considerable degree of aëration prior to being used upon works.

3. *Excessive Quantities of Chemical Impurities, such as Magnesia and Sulphur Compounds.* (A) *Magnesia.*—In practically every Portland cement this oxide exists in greater or less proportion. The cements manufactured on the banks of the rivers Thames and Medway show a considerably smaller amount than those made from the shales and limestones of the Warwickshire district. Until fairly recently engineers and chemists differed very considerably in their opinions as to the action of magnesia. The researches of Dr. Spencer Newberry, of Cornell University, have, however, thrown considerable light upon the action of this ingredient, and in the very able paper which he read before the New York section of the Society of Chemical Industry in 1897 he concludes with the following paragraph :—

"Magnesia, though possessing marked hydraulic properties *when ignited alone*, yields no hydraulic products when heated with silica, alumina, or clay, and probably plays no part in the formation of the cement. It is incapable of replacing lime in cement mixtures, the composition of which should be calculated on the basis of the lime only without regard to the magnesia present."

Herr Dykerhoff presented an exhaustive report to the German Association of Manufacturers, which tended to prove that the presence of over 4 per cent. of magnesia resulted in a weakening of the cement. He showed that the action of the magnesia was expansive, and took a considerably longer time to develop disintegration than does free or loosely combined lime.

Professor Le Chatelier has also experimented upon this somewhat complex question, and he mixed 5 per cent. of magnesia with a sample of ordinary Portland cement of good quality. The swelling did not commence for six months in the case of the cold paste, but in water at boiling temperature expansion began in six hours and ended in forty hours. In this connexion it is interesting to note that the magnesia, *when coarsely ground*, produces expansion, but when in the form of an impalpable powder, the swelling produced is not nearly so marked.

Whilst it is difficult to make an absolute pronouncement upon the effect of magnesia, yet it is evident from the result of experiments that it is desirable to have the least possible amount of this ingredient present in a cement, as with average grinding its tendency is towards expansion, though this takes place after a lapse of considerable time, and the effect of aëration is of no avail in reducing the dangerous properties of magnesia.

(B) *Sulphur Compounds.*—One of the most dangerous and common compounds of sulphur which can exist in Portland cement is that known as sulphate of lime. The presence of this compound is shown in the analysis by a large sulphuric anhydride figure. Like magnesia, there is bound to be a certain amount of sulphur present (derived largely from the fuel) in every cement, but if the percentage exceeds two parts it is probable that some expansion will take place. 0·59 of sulphuric anhydride will represent about 1 per cent. of calcium sulphate, and this being a readily oxidisable compound, causes considerable expansion. Personal experiments with cement to which definite proportions of sulphate of lime had been added up to a maximum of 4 per cent. have proved that it is unadvisable to either add this material or to accept a cement which contains a higher sulphuric anhydride figure than indicated above. The writer's firm, in reporting some years ago on two samples of cement made from clays which lay close together, and which, to every outward appearance, were identical (but which when mixed with the same proportion of lime gave widely different strengths in the finished cement), found upon analysis that the one clay contained but a small amount of sulphate of lime, whereas in the second case nearly 7 per cent. was present, due to sulphate in nodule form. Mr. D. B. Butler quotes a similar experience in his recent work on Portland cement; and M. Durand-Claye, who was called upon to examine mortar from a sea-wall which had failed, discovered that the sea had had the effect of washing out the sulphate of lime from the work.

The call for finer grinding of cement, together with the heavy demands made upon manufacturers for quick delivery during the last few years, have resulted in the mixing of small percentages of sulphate of lime (gypsum) with cements, the object being to retard the tendency which very finely ground cement has to set with inconvenient rapidity. It would be far preferable in the best interests of work to adhere to the older method of aeration which has been practised for many years past, as it is absolutely safe, and, providing the material is a good one, no anxiety need be felt as to the subsequent expansive action of the cement in work.

4. *The Presence of Artificial Impurities.*—Some manufacturers (although fortunately they are in the minority) use considerable quantities of two adulterants, viz., slag and Kentish rag. The former material, when ground up without any chemical preparation and incorporated with the cement, is undoubtedly an element of considerable danger, as it is very variable in its chemical composition, contains a considerable amount of sulphur, and, in addition to this, it is a dilutant which detracts very considerably from the strength of the cement when mixed with sand or gravel, so that it is both dangerous and constitutes a direct robbery so for as the user is concerned. Kentish rag, which is a sandy limestone, has no dangerous effect so far as expansion is concerned, but it is a distinct dilutant.

5. *Bad Milling.*—One of the most expensive items in the preparation of cement is the grinding of the clinker, and it is somewhat natural that manufacturers should not pay the attention to the fineness of their material which they would doubtless do if it were less costly. From the user's point of view a double advantage is to be obtained by the purchase of cement containing as much impalpable powder as possible, as its covering capacity is considerably greater when in this condition, and, further, the source of danger due to particles of free and loosely-combined lime in the coarser pieces of clinker is eliminated. The old specifications allowing a residue of 10 per cent. of a 2,500 mesh are rapidly becoming obsolete, and it is somewhat startling, but nevertheless true, that from 6 cwts. to 8 cwts. per ton of cement supplied under the old specifications was useless for a cementitious purpose.

Some experiments made by the writer with an ordinary builders' cement a short time since revealed in a remarkable way the hidden dangers due to coarse grinding. The sample in question had stood the tensile test admirably, but it was coarse; and upon application of the Michaelis boiling test the pats cracked in all directions, and over the surface of them there were a number of eruptions like miniature volcanoes. This expansion in the work might not have occurred for some months, or possibly years, but it most certainly would have occurred at some time; and as the cement was to be used for floors, and therefore in a confined lateral space, the defects which would have developed might have been exceedingly serious.

The American Society of Civil Engineers recently appointed a Committee for the consideration of the proper manipulation of tests of cement, and whilst the economical side of fine grinding is rather outside the scope of this article, it is interesting to note that in the Committee's Report of the reply to Question 9, which dealt with the size of mesh which should be used for sifting, Professor J. B. Johnson says, with reference to the 14,400 sieve, that there is no significance to be attached to results from coarser sieves, so far as cementitious value is concerned. Mr. A. E. Carey stated in the Royal Engineers' Institute Papers, vol. 24, that "every particle of cement which will not pass through a 32,257 mesh sieve is of little or no use in making concrete." Whilst this statement appears to be distinctly startling, it is gradually becoming accepted, and many of the German manufacturers are grinding to a very fine flour. A sample recently tested by the writer's firm showed a residue of only 3·2 per cent. on the 14,400 sieve. At least one important cement works in this country has under consideration the question of separating the flour of cement from the coarser particles and re-grinding the latter.

Internal and External Causes over which the User has Direct Control.

6. *The Use of New and Un-aërated Cement.*—This side of the question has already has already been dealt with in a fragmentary manner, but although it has been recognised from the time when Portland cement first came into popular use that it should be weathered, the writer ventures to think that even now engineers and architects do not pay sufficient attention to the necessity for shooting and carefully turning the cement prior to using the concrete. It is practically impossible for manufacturers to find adequate storage room for cooling cement, and the only alternative is for the purchaser to obtain this material well in advance of the time when he requires to use it. Case after case has come to the writer's knowledge where a cement, perfectly satisfactory in its chemical and physical attributes, has been the cause of trouble from the fact that the user of it had not exercised proper care in aërating prior to mixing the concrete. The writer's firm was recently called in to report upon the failure of a small building, and the measurements show conclusively the tremendous expansive force which is developed by the presence of lime in unweathered cement. The building when originally erected measured 16 ft. from wall to wall. A few months afterwards, when the hot cement had expanded, the measurement at floor level was 16 ft. 3 in., and the walls were bulged to an alarming extent. Much of this trouble could probably have been saved by the spreading of the cement.

Mr. Carey, in the paper which has already been quoted from, says :—

"I recollect in one instance seeing the floor of a large warehouse, the walls of which were well built of 18-in. brickwork with heavy iron cross ties, cracked and in serrated ridges from end to end. This result was due to the use of an underburnt cement in the concrete.

The effect of underburning, as mentioned before, can (unless it is excessive) be almost entirely neutralised by weathering.

7. *The Use of Mortars for Rendering which Contain too High Proportion of Cement.*—It is a well-known fact that neat Portland cement exposed to air diminishes slightly in volume. Should the material be placed in draughts or in sunshine the tendency of the shrinkage is to increase, that is to say, under normal conditions a neat cement will inevitably show slight hair cracks, especially if the face of the work is allowed to dry with any speed. As rendering is commonly used for the purpose of making

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brickwork impermeable to water, it is very necessary that these cracks shall not exist, and the best way to avoid them is by the use of about one part of absolutely clean sharp sand in combination with the cement. A further cause of unsatisfactory neat rendering is due to the inability of a bricklayer to lay the face coat with sufficient rapidity, and he is therefore constantly tempted to what he calls "knock up" the partially-set cement a second time.

Disintegrating Atmospheric Conditions.—It is, of course, quite impossible to entirely neutralise the disruptive action set up by extremes of temperature, but it has been shown over and over again that concrete made of first-class materials is very little acted upon by fire or frost. Nevertheiess, repeated expansions and contractions must in time tell upon this material, and have the effect of weakening it. If care is taken to shield the concrete from frost until it is thoroughly set in the winter, and to keep the surface continually moist in the summer, extremely good results can be obtained, but this second precaution is frequently disregarded altogether, and the result is that the water which is necessary for the process of crystallisation is evaporated by the action of the sun or air, and the mortar or concrete consequently loses enormously in its tensile strength. Extensive experiments on this question were made at the McGill University a few years since, and in the report the following paragraph appears :—

"Attention has been drawn to the poor results obtained by the same tests (viz., on 6 to 1 concrete) by reason of long exposure to dry air. This shows up a very important point, viz., the necessity for covering up carefully all concrete and cement works exposed for any length of time to dry air and sun. The bad effects of these agents is plainly demonstrated, and it is doubtful whether much strength will ultimately be recovered."

The writer's own experience makes him quite certain that the action of the sun is as destructive upon the tensile and adhesive properties of rendering as the action of frost ; and in the construction of a heavy section of retaining wall some years since this fact was brought out in a remarkable way. A portion of the wall in question faced south, whilst another section faced nearly due west. The latter portion was rendered during the cold weather, and the former during the summer. The western portion was covered in the ordinary way, whilst the wall that faced south had no special protection given to it, and the rendering showed exceedingly bad signs of failure within a very short time of the construction of the work. The quality of the sand and the cement was precisely similar in each case, and equal care had been taken as far as workmanship was concerned.

LETTER FROM PARIS.

THE Académie des Beaux-Arts has awarded the Prix Chaudesaigues of a value of 80*l*., comprising two years' study in Italy, to M. Moisant, pupil of M. Moyaux. First and second mentions were awarded to M. Hebrard, pupil of MM. Ginain and Scellier de Gisors, and M. Boutfroy, pupil of M. Moyaux. The subject ot the competition was "A Triumphal Arch raised in honour of a Foreign Sovereign."

During the vacation at the Ecole des Beaux-Arts a considerable amount of work has been done in rearranging the various studios, and the old Ateliers André have been transformed into a museum for the exhibition of the various work done by competitors for the past scholarships at the Ecole. It was intended to put into a thorough state of cleanliness and repair the large number of cubicles in which the competitors are shut during the Prix de Rome competitions, but the walls are so covered with cartoons and sketches by old students since become masters of French art that it was decided not to touch any of these portions. A series of new "loges" are now being arranged in a simple but rather dainty manner for the use of the recently admitted female students.

The Manufacture Nationale de Sèvres has just been enriched by the addition of a new room on the first floor for exhibiting specimens of the various work of the manufactory since its foundation under the reign of Louis XV. This room contains five large showcases, in the first of which are exhibited specimens of the first models executed in the styles of Louis XV. and XVI. ; the second contains work done during the Empire and the Restoration ; the third shows examples of the style of the Second Empire and the first productions of ceramic ware with applied ornaments. The other two are reserved for specimens of the more recent work which was exhibited at the late Exhibition.

The subject of the annual competition made under the auspices of the Société Nationale des Architectes was "An Almshouse for Victims of Labour Accidents," the cost of which, ground not included, was to be 14,000*l*. The first prize was awarded to M. Clabaut, and second and third prizes to MM. Parenty and Paulet respectively. An additional prize, given by the Minister of Public Instruction, was awarded to M. Clabaut.

M. Georges Cain, the curator of the Musée Carnavalet, is preparing in one of the rooms of this museum, on the Place des Vosges, the installation of the Victor Hugo Museum. Amongst the many interesting souvenirs of the great poet will be the curious collection of wood panels sculptured by Victor Hugo when living at Jersey, and painted by him in bright colours, somewhat in the spirit of Japanese art. These panels—of which there are a very large number—covered the walls of the poet's study at Jersey, and will now be arranged in wall panelling around the walls of the new room at Carnavalet.

The new Hotel de Ville of Dunkirk, inaugurated very recently by the President of the French Republic, is a very interesting example of the work of M. Cordonnier, of Lille, an architect whose work, in the spirit of the old Flemish style, is well known in the North of France and in Flanders. The building is of red brick, heightened by portions of white stone around the bays, and surmounted by a central clock tower of simple but elegant design and 250 ft. high. A fine staircase placed in the centre of the building leads to large and airy rooms on the first floor ; on the landing is a stained-glass window representing Jean Bart returning from one of his seafaring adventures. M. Cordonnier carried off the first premium in the competition for the Bourse of Amsterdam ; he took a grand medal at the Salon of 1892, and a grand prix at the exhibition of 1900.

The Statistics Department of the Prefecture of the Seine has just completed its report on the profits realised by the city of Paris in connexion with the 1900 Exhibition. According to this report, the Municipality has realised a profit of 160,000*l*., to which must be added the value of the newly-acquired property of the Champ de Mars and the Petit Palais, handed over to the town by the State. The extra business transacted by the inhabitants of Paris during the Exhibition is stated to have amounted to 18,000,000*l*. All the smaller buildings of the Champ de Mars have now been demolished, but nothing has yet been decided as to the ultimate destiny of the Galérie des Machines, the Palais d'Electricité, and the Château d'Eau. The authorities have entirely failed to meet with purchasers for the large iron buildings on either side of the Champ de Mars ; the public competition offers gave no result ; and it is probable that the authorities will now deal direct with those contractors whose private offers are thought worth considering.

The beautiful Fontaine de Sèvres, a piece of work by M. Sandier, which was exhibited in the grounds of the Champs Elysées and was wilfully damaged by mischievous persons, will be completely remade with certain modifications, and will probably go to adorn the garden of the Palais du Luxembourg.

The interesting old Palais de Justice of Nantes, built during the fifteenth century and menaced with destruction on account of its ruinous state, which has become a danger to the immediate neighbourhood, has at length, thanks to the steps taken by the archæological committee of the district, been classed as one of the Monuments Historiques, and will therefore be taken into hand for repairs. The architect of the Departement has been instructed to prepare designs for a new Palais de Justice, and the old building having now been purchased by the Municipality of Nantes for the sum of 1,600*l*., will be carefully restored and be used for the purpose of municipal offices and the housing of the large municipal library.

The town of Marseilles announces its intention to demolish and reconstruct the important old quarters of the town situated behind the Bourse, and has invited architects and contractors to enter into competition and to tender for the work, which has been estimated to cost about two and a-half million pounds. No offers have, however, been received, first by reason of certain onerous terms in the conditions, and also in consequence of the rather bad reputation the town has amongst architects and contractors, from whom it has from time to time, by means of promises which it is said were never kept, obtained designs and schemes which have never been put into hand, or have been carried out partially without any profit or return to the initiators.

The Municipality of Paris has decided to embellish and render more attractive the crematoria buildings in the cemetery of Père Lachaise. It is proposed to hide the ugly chimney stack by means of a large dome, and the building will be decorated in such a fashion as to render the whole aspect a little less dismal.

A syndicate of Clermont - Ferrand and L'Auvergne, under the auspices of the Touring Club, has opened a competition amongst architects for the best plans and designs for a modern hotel arranged, designed, constructed, and installed according to the best and latest precepts of hygiene and sanitation. The jury, presided over by M. Gustave Rives, architect to the Touring Club, is composed of the President of the Société Nationale des Architectes, M. Fernoux ; M. François Roux, architect ; two architects and two "maitres d'hôtel" belonging to the district, elected by the syndicate, and two members of the syndicate. Money premiums and medals will be awarded to the authors of the chosen designs. M. Constant Orsat, delegate of the Touring Club of France at Lyons, has obtained from the municipality of St. Gervais-les-Bains, the concession of a large piece of ground in a most admirable position for the purpose of erecting a modern hotel, to be called "Hôtel du Touring Club," and a syndicate for this purpose is being formed.

The date for the inauguration of the new Sorbonne, of which the architect is M. Nénot, and which, including the immense library building to contain 900,000 volumes, has taken twelve years to complete, has not yet been decided. The 700th anniversary of the founder of the Sorbonne, Robert de Sorbon, falls on October 9, but this date, although interesting as one appropriate for the inauguration, has for certain reasons not been adopted.

M. Sortais, architect, Grand Prix de Rome, Chief Inspector under M. Bouvard at the Exhibition of 1900, has been appointed Second Inspector of Civic Buildings for the reconstruction of the Palace of the Cour des Comptes.

The house-owners who refused to comply with the terms of the recent law concerning the application of the "tout à l'égout" drainage to their houses, and were summoned by the City of Paris to immediately put into hand the necessary work, have lost their case in the Courts of Law, and have been condemned to pay nominal damages to the City, and to proceed at once to execute the sanitation work comprised in the terms of the law. As regards their defence, that the City itself had not fulfilled its duties to householders by completing the promised municipal work of sewage disposal, the judges considered that this question had nothing to do with the defendants, these latter having first to fulfil their duties with regard to the terms of the law, and then if they desired they could on their side attack the Municipality for the non-execution of its promises.

Owing to the present diplomatic difficulties between France and Turkey, M. Emile Bertone, architect, Prix de Rome, who had been entrusted with an archæological mission in Turkey, specially in view of researches at the ruins of Palmyra, has been informed officially that the mission will be changed for one in Germany and Denmark.

As the Commission des Monuments Historiques has found the credit annually voted for the restoration and maintenance of public historical buildings quite insufficient for its requirements, this credit will next year be increased by 12,000*l*., bringing the amount to 57,000*l*., an amount which will still be very moderate considering that the Commission has to deal with no less than 2,570 buildings.

NEW HOTEL, HALIFAX.—Plans for a new hotel to be built at the west end of Halifax, prepared by Mr. Lister Coates, architect, of that town, have been approved by the magistrates, to replace one to be removed for street improvements. The works are to be put in hand as early as possible.

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THE BATTERSEA ELECTRICITY SUPPLY WORKS.

Last Saturday the Central Electric Generating Station of the Battersea Borough Council was formally opened by Mr. Torrance, the Chairman of the London County Council. The large engine-room was crowded with guests, and the speeches, especially one made by Mr. John Burns, M.P., in praise of municipal enterprise, were enthusiastically applauded. Battersea Vestry obtained a provisional order five years ago, so they cannot be accused of undue haste in acting on it. They have wisely made plenty of room for future extensions. Although the plant installed has a capacity of only 1,500 h.-p., yet the buildings will accommodate plant of about 7,000 h.-p., and provision can be easily made for double this amount on the extensive site which has been acquired. One of the most striking features of the building is the octagonal chimney 220 ft. high, which is very substantially built. It measures 25 ft. 6 in. by 25 ft. 6 in. at the base and at the top 13 ft. 6 in. by 13 ft. 6 in. We were very favourably impressed with the appearance of the engine-room. Its height to the top of the roof is 55 ft. 6 in., and the girders for the travelling crane are 34 ft. above the floor. The walls are faced with white bricks embellished by blue and brown glazed tiles, and hence the light in the room is excellent and cleanliness can be easily maintained.

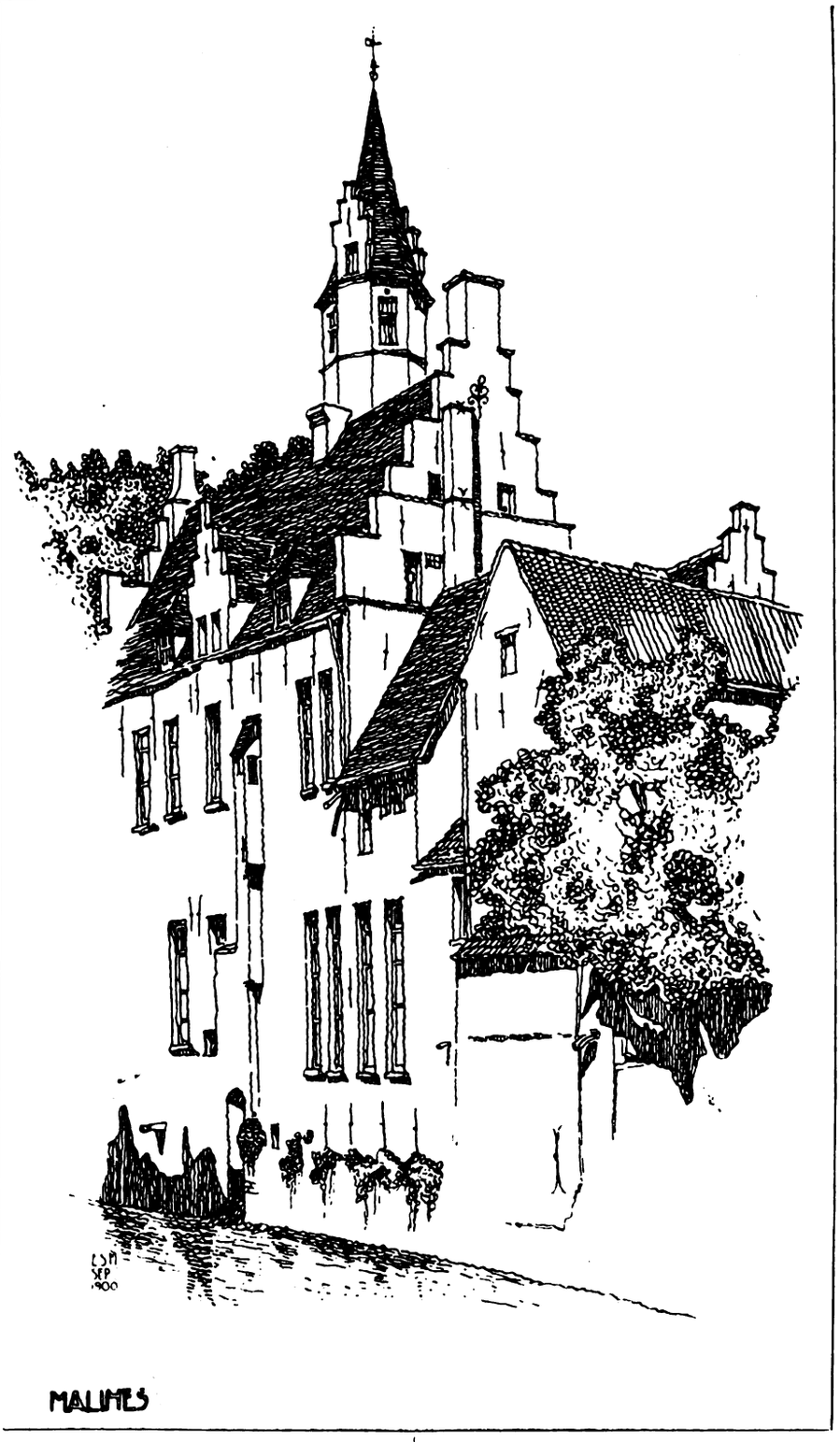
In the boiler-house are four Babcock & Wilcox water-tube boilers, which are fired by mechanical chain grate stokers, two to each boiler. The upper portion of the band, which is formed of cast-iron links, travels slowly from the front to the back of the grate, carrying with it a layer of small coal, which is fed on to it by a hopper in front of the boiler. The thickness of the layer and the speed of the band can easily be regulated by the fireman. The products of combustion on their way to the chimney pass round the 256 tubes of a Green's economiser, through which the feed-water for the boilers is passed. The water entering the boiler is thus raised almost to the same temperature as the water in it, and this leads to a considerable economy in fuel consumption.

The engines are Willans & Robinson triple expansion type, and are directly coupled to multipolar dynamos made by Messrs. Mather & Platt. The dynamos have carbon brushes, and are excellent examples of the best English workmanship. The switchboard is placed on an elevated platform at one end of the room, and there are several novel points in its design. The main dynamo and battery switches are fixed at the back of the main board, and are worked by rods attached to levers placed in front of the board. The voltage of the dynamos is regulated by handwheels placed in front of the switchboard, one turn of the hand wheel moving the rheostat slider over one contact.

The system adopted for the supply of electric energy is the continuous-current three-wire system, the pressure of supply being 230 volts, so that there is a pressure of 460 volts between the outers. The area supplied is fan-shaped, the station which is on the river being at the centre of the fan. The farthest point supplied is 2¼ miles distant from the station. The distributing mains are laid on the solid system —that is, the three cables are placed side by side in a cast-iron trough and melted bitumen poured over them; they are then enclosed by a tile covering.

Two batteries of accumulators are used which will enable the steam plant to be shut down at times of light load, and they also assist in maintaining the balance of the three-wire system. There is a very large arc lamp load, 240 street lamps having been erected. Each of these lamps takes ten amperes, and they are connected ten in series between the outers. The lamps are supported on ornamental cast-iron pillars, generally from a bracket from the top of the pillar. The design of this pillar was specially prepared some years ago by the School of Art in Edinburgh, and it has since been used in Westminster, Carlisle, and several other places.

The consulting engineers are Messrs. Kennedy and Jenkin, and the design of the station is very similar to several others recently designed by them. The only drawback to the service from the consumer's point of view, is, in our opinion, the pressure of 230 volts. This is practically the highest pressure allowed by the Board of Trade in this country. We would recommend the Battersea Borough Council to get a batch of 230-volt lamps and another batch of ordinary 100-volt lamps tested for life and efficiency. It will be interesting to see how much the inefficiency of the consumer's lamps discounts the benefit he receives from a low meter bill. Electricians are apt to forget that it is light and not electric energy that a consumer wants.



Additions to Cottage Hospital, Lytham, Lancs.—On the 21st ult. there was opened a memorial ward which has been built at the Cottage Hospital, Lytham, by public subscription as a memorial to the late Dr. Luke Fisher, who for nearly thirty years was hon. medical superintendent for that institution, and hon. secretary. The new ward is in keeping with the older part of the building, and is connected with it by a glazed corridor with tiled floor. The accommodation is for five beds. It is cross-ventilated by windows on either side, and fresh air is also admitted under each bed by a special arrangement. The floor is of polished oak, the walls are finished in Keene's cement and painted, and all corners are rounded off so as to prevent accumulation of dust. The architects were Messrs. Heywood & Harrison, of Accrington and Lytham, and the contractors were Messrs. J. E. & B. Myerscough, of Lytham.

HOUSES AT MALINES AND BRUGES

These two views of characteristic bits of street architecture, the one from Malines, the other from Bruges, are from pen sketches by Mr. E. Stanley Mitton, architect, of Birmingham.

THE ECCLESIASTICAL ART EXHIBITION, BRIGHTON.

The art exhibition held in connexion with the Church Congress this week at Brighton does not represent ecclesiastical art in this country at its best. If it did represent the best life in church art and handicraft we should feel that "ecclesiastical" and "art" were words henceforward not to be used in conjunction. The exhibits are shop exhibits, feeble copies of old workmanship of an age differing in ideals and in methods from those of the present. We think the Congress has been ill-advised in the title of the present exhibition. It savours more of the bazaar. Art is outside, or will not show herself. Though unrepresented, there are happily a fair number of individual workers

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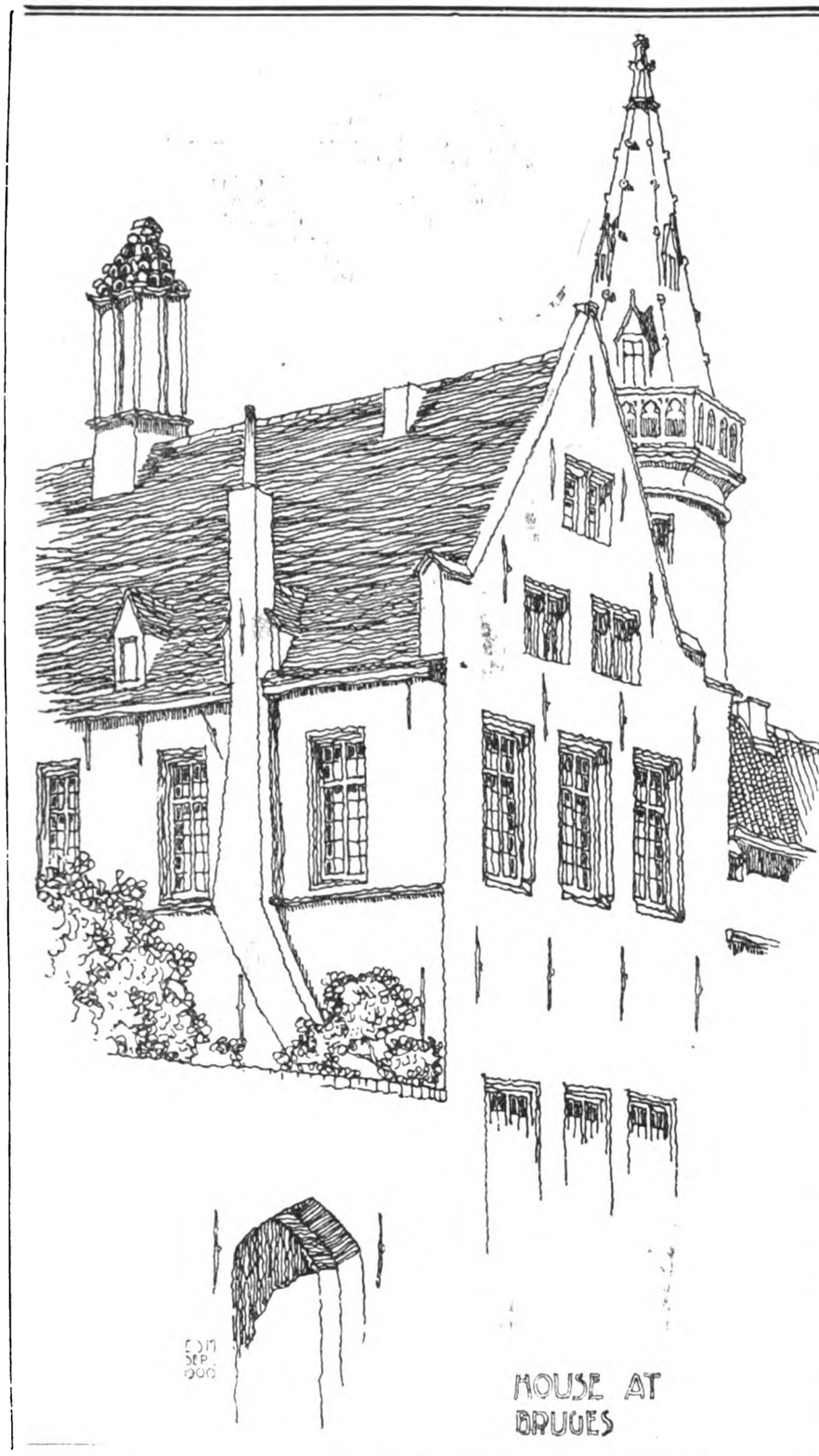

devoted to ecclesiastical art. Stimulatedby the work left by such men as Sedding and the younger Gilbert Scott, they are working upon reasonable lines that admit of scholarly research and originality. The shop article, however, at present represents the taste of the majority of the clergy and laity, a different state of things from when the Church led the way, when art was hid in the Church and sought for in the Church by the laity. That age is represented at the present exhibition by a loan collection of some rare and valuable objects. A fine early thirteenth-century enamelled chasse or reliquary, representing the martyrdom of St. Thomas of Canterbury, a work of great excellence; several plain, but beautifully proportioned, chalices of the seventeenth century; some pierced silver Byzantine work; a later sixteenth-century pair of silver maces. These are some of the most interesting of the gold and silver smith's art.

Of many interesting books, a Latin version of the Four Gospels written in Anglo-Saxon characters, not less than 1,000 years old, is most interesting; apparently it was bequeathed to the See of Hereford by Bishop Athelstan, who died in 1055. It is in a fine state of preservation. Also the original charter of Cuthwulf, Bishop of Hereford; a grant made with consent of Berthwulf, King of Mercia, A.D. 840, besides several fine MSS. lent by the Dean and Chapter of Hereford and by private individuals. The finest embroideries are two examples of Italian work of the seventeenth century, two cope-hoods, one representing Our Lady presenting the rosary to St. Dominic, the other, St. Francis of Assisi, receiving the Stigmata. There are some interesting copies of mural paintings from Sussex churches, the originals being of great interest, representing the oldest and most complete mural paintings remaining in England. Noticeable, also, is a very fine collection of monumental brass rubbings lent by Mr. Henry E. Franks.

WESLEYAN CHAPEL, COTGRAVE, NOTTINGHAM.—Memorial-stones of a new Wesleyan chapel, at Cotgrave, were laid on the 26th ult. The building is to be in the late Gothic style, and is from the designs of Mr. A. E. Lambert, of Nottingham. It is to seat about 220 persons, and is estimated to cost 1,250*l*.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A HOME counties district meeting of the members of the Association of Municipal and County Engineers was held at Southend on Saturday, September 28. In connexion with the meeting most of the members attending paid a visit on the previous day to the works of Messrs. Millar's Karri and Jarrah Forests, Limited, at Purfleet. The party travelled to Purfleet by special train, and on arrival at the works were entertained to luncheon by the firm, Mr. C. Temperley presiding. After luncheon an inspection was made of the works, which were situated on the north bank of the Thames at Purfleet, and comprise an area of 42 acres laid out in bays, each connected by a railway siding, enabling the travelling cranes to reach each stack of timber. The sawmills are equipped with Temperley's patent cross-cut saws, driven by electric power, and turning out blocks at the rate of 6,000 per hour. The Australian wood is delivered direct on to the works from steamer discharged at a Karri-built pier, 300 ft. in length by 50 ft. in breadth. After a complete inspection of the works the journey was resumed to Southend.

The business meeting was held in the Council Chamber at Southend, on Saturday morning. Mr. E. G. Mawbey, C.E., Leicester, President, occupied the chair, and was supported by Messrs. W. Nisbet Blair, St. Pancras; Howard Smith, Westminster, T. H. Nabbicom, Bristol; A. E. Collins, Norwich; E. J. Silcock, Leeds; I. Shone, Westminster; T. Cole, Westminster (secretary); C. Jones, Ealing; A. D. Greatorex, West Bromwich; C. C. Smith, Sutton; Hayward, Sudbury; W. Harpur, Cardiff; Walker, Croydon; Pierce, Twickenham; E. P. Hooley, Nottingham, and others.

The Mayor (Mr. J. Francis), who was attended by numerous members of the Council, formally received and welcomed the Association to Southend. He said, although not so large a town as many represented at the meeting, Southend gave evidence that it had carried out works of interest, not only to themselves, but to the general community.

The President, in acknowledgment, said he had never been to Southend before, but it was an agreeable surprise to him to find so pleasant a seaside resort so near to London. He had been struck by the evidence of the great amount of public spirit which existed there. The splendidly complete system of electric traction promoted by the Corporation had been carried out entirely by the Corporation officials. They had also a very excellent sea-water scheme for watering the streets and flushing the sewers. Then, in respect to sewer ventilation, he understood they had shut up all the surface-grids and put up shafts, and that since this had been done they had got rid of all complaint.

On the proposition of Mr. A. D. Greatorex, West Bromwich, Mr. R. J. Thomas, County Surveyor of Buckinghamshire, was re-elected honorary secretary for the Home Counties district.

Mr. A. Fidler, A.M.Inst.C.E., Borough Engineer, then read a paper on the Municipal Works of Southend-on-Sea. He said the population at the last census was 28,793, and the rateable value 200,000*l*. In a decade the population and rateable value had more than doubled, a rate of increase that could only be regarded as sensational. Southend undoubtedly owed its prosperity to its proximity to London. The population was largely residential, numbers of the residents being engaged in business in London, and going to and from there every day. During the season the floating population reached a high figure, very frequently 80,000. The building by-laws in force were based on the model by-laws of the Local Government Board. Three building inspectors were engaged in supervising the erection of new buildings. The drains were all laid on concrete, with water-tight joints and disconnected from the sewers. They were all water tested before being covered up, and finally smoke tested prior to the granting of the certificate for habitation, which must be obtained before occupation of each house. A record book was kept which showed the history of each house inspected. The majority of the houses built were of an annual rental of 35*l*. to 40*l*. Recently some very ambitious buildings had been added to the town, large hotels, amongst them the unfinished Hotel Metropole, said to cost 300,000*l*., and the Kursaal, said to cost 200,000*l*. The Public Streets Works Act, 1892, had been adopted. As soon as any new road

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or street was sufficiently built upon, which very quickly followed its laying out, steps were taken to make it up in accordance with this Act. The value of work executed in this department averaged 10,000*l.* per annum. Prior to 1897 the main drainage outfall system was of a very primitive character. Sewage was discharged at many points and at all stages of the tide. The natural result was a foul foreshore with its attendant evils.

The present outfall system was designed and carried out by Mr. Mansergh, President Institution of Civil Engineers, in 1897. The works consist of two systems, viz. :—(1) The Eastern Valley system; (2) The Western Valley system. In each a high level intercepting sewer discharged into a storage tank. There was also in each a low-level area from which the sewage was lifted to the storage tank. Each storage tank communicated with the main outfall which discharged into a channel just covered at L. W. O. S. T., about one mile from the shore and about 600 yards east of the pier. The sewage is discharged only on a falling tide, *i.e.*, at high water to within two hours of low water. The outfall was 27 in. in diameter, laid at a ruling gradient of one in 1,500, and was capable of discharging on an average 900 cubic feet per minute. Complete records were kept of the daily working and inspection of the foreshore, and it had been demonstrated that if the proper conditions were observed there was no deposit of sewage whatever on the foreshore; it was completely carried away to sea.

The capacity of the Eastern Valley storage tank was 540,000 gallons.

The tank was covered and was constructed similar to an ordinary covered storage water reservoir. The normal daily dry weather flow into the tank averaged 400,000 gallons. The scheme was designed to deal with a population of 40,000 people with an estimated dry weather flow of 800,000 gallons per day. The present population was rapidly approaching that figure, and in view of the expected requirements he had already received instructions to report on the whole question, so that provision might be made in time and prospective requirements be anticipated. Up to two years ago the ventilation of sewers depended upon surface gratings. Reporting on the subject in 1898 he recommended that a ventilating shaft or column should be fixed opposite every manhole and the manhole cover sealed. The recommendations were adopted, and a loan for 3,500*l.* obtained by sanction from the Local Government Board. Where possible ventilating shafts (glass lined internally) 6 in. by 4 in. internal dimension, were fixed against the sides of the houses and in the highest parts. Where permission to fix these could not be obtained columns were erected on the footpath, 6 in. internal diameter and 30 ft. in height. In the days of surface gratings complaints of foul smells from the sewers were constant. Now they were never received. Southend enjoyed the reputation of possessing the longest pier in the country. The estuary of the Thames was very flat and low water mark was about one mile from the shores. From the designs of the late Mr. Brunlees the present pier was built in 1890, and cost 87,600*l.* The pier was extended in 1896-7 by 170 yards by Mr. Brunlees, jun., and Sir J. W. Barry. There was now at the pier head about 30 ft. of water at L. W. O. S. T. enabling very large steamers to land and embark passengers. The current from the pier tramway and electric lighting way generated on the pier premises, but it was intended to obtain power from the central electricity generating station and abolish the present station. The pier undertaking had altogether cost 103,000*l.*, and since its completion had contributed over 15,000*l.* to the rates. The net profit for the year ended March last was 3,622*l.* In 1897 the Corporation had conveyed to them about 20 acres of low-lying land in Southchurch for the purposes of a recreation ground. Amongst the conditions attached to the gift were the construction of a lake for the drainage of the remainder of the estate and a conduit to convey surplus water to the sea. He had prepared plans for laying out the land, and of the works proposed there had been carried out fencing, cricket pitches, planting, lake, conduit overflow and valve chambers, and groyne, at a cost of about 5,000*l.* In 1899 he reported on the question of the utilisation of sea water for street watering and sanitary purposes; the scheme was adopted, and the works carried out at a cost of 10,900*l.* One of the most important schemes carried out by the Corporation was the light railways scheme. The estimated cost of the whole scheme was 80,000*l.*

The existing provision in the shape of marine parades and esplanades was inadequate to accommodate the large masses of people so frequently assembled there. The question of carrying out improvements in this direction had frequently been discussed, and many schemes prepared and submitted for adoption. No scheme for the central portion had yet been adopted. The author prepared a scheme in 1899 providing for a continuous parade and sea wall from the front opposite the Halfway House on the east to Chalkwell Hall on the west, a distance of four miles. The estimated cost was 300,000*l.* Generally the scheme was for a roadway of a width of 70 ft. with a sea wall, but the central portion was to be specially treated. About forty-five acres of the foreshore was to be reclaimed. The reclaimed area to be utilised for lakes, baths, pleasure-grounds, &c. Shops to be built on the north side, and a marine drive on the south side. It was estimated that the receipts from this scheme would have left a profit after paying all charges on loans, maintenance, &c. Against this, if the work was only confined to road-widening, an annual charge would be made on the rates until the loan was paid off. Quite recently, however, schemes had been adopted for the construction of about one mile of 70 ft. wide road and sea-wall on the western end of the road. The first portion, about 650 yards long, the Corporation executed at their own cost. The estimated cost was 19,000*l.* The second portion, about 1,100 yards, was being done by arrangement with the Chalkwell Hall Syndicate, who were contributing payments amounting altogether to 8,000*l.* towards the cost, which was estimated to be 21,500*l.* In 1898 the Council invited designs for a block of buildings, to contain a Town Hall and public-houses, technical school, free library, and police-station. The designs of Mr. H. T. Hare were accepted, the estimated cost being 40,000*l.* It was decided first to proceed with the technical school portion only, and the foundation-stone had just been laid by Lord Avebury. This portion would cost altogether 19,000*l.*, towards which the County Council contributed 5,000*l.* The Corporation owned a considerable portion of the cliffs to the west of the pier, which were laid out and planted and formed a very valuable and appreciated resort for the visitors in the season. In addition, the Corporation had just negotiated the purchase of Chalkwell Hall and grounds (about 23 acres) for a public park at the price of 16,750*l.*

Mr. T. H. Yabbicom, Bristol, in moving a vote of thanks to Mr. Fidler, said the paper showed that Southend had a very energetic Corporation, anxious to do everything they could for that rising community. Mr. Fidler had referred to the adoption of the Public Works Act of 1872. He (Mr. Yabbicom) thought the weak point of that Act was giving the Justices, who were not experts in road-making, a sort of veto over the wishes and decisions of a committee or council who had devoted a very large amount of time to the subject.

Mr. W. Harpur, Cardiff, who seconded, remarked that there was great difficulty in knowing in what condition wood paving should be laid down. He had been laying down a large quantity of wood paving, and his experience had been the reverse of Mr. Fidler's. The Jarrah, which had been in stock, instead of expanding, had contracted, leaving a joint of 1 in., which they had had to fill up. Now the question was, What was going to arise when they had the wet weather during the winter? Would they have the experience of Mr. Fidler, that expansion pushes the blocks out? He was having a large quantity of that rightly or wrongly condemned red gum, and he would be able to get experience of it. He believed there was nothing like getting one's own experience instead of taking what was in the newspapers.

Mr. G. E. Collins, Norwich, Mr. E. J. Silcock, Leeds, Mr. Howard Smith, Westminster, and others supported the vote of thanks, which was passed unanimously.

The Mayor (Councillor J. Francis) entertained the members to luncheon at the Kursaal, and the afternoon was devoted to inspecting the electric generating station, storeyard, and tramway works.

Books.

Land Surveying: Its Theory and Practice. By Samuel Skrimshaw, F.S.I. London: Frank P. Wilson, *Estates Gazette* Office. 1901.

Largely owing to the wise action of the Surveyors' Institution and, we may add, of the Auctioneers' Institute, the necessity for adequate training is now thoroughly recognised as an essential by all who intend to become professional surveyors. In writing the book now before us the author evidently intended to furnish in a convenient form the information most needed by candidates for professional certificates, and to provide a serviceable book of reference for busy practical men. A cursory glance through its pages at once indicates that the general arrangement is well suited to the latter purpose. There are numerous diagrams and other illustrations, which often save pages of wordy explanations; every chapter is subdivided into numbered paragraphs for internal reference, and the subject matter is clearly indicated by a full table of contents and an adequate index. To what extent the other objects of the work have been realised is a point that requires more critical examination.

Neglecting the customary historical sketch, the author begins with a concise statement of the purposes for which a land survey may be made, of the different kinds of surveys, and of the surveys required by the Surveyors' Institution examination. A somewhat lengthy, but necessary, dissertation follows upon the instruments used in land surveying and incidental work. In this section of the volume a useful preliminary feature is a schedule where instruments are grouped according to the purpose for which they are employed. The following extract is given to explain our meaning more fully, and to serve as an example of the method adopted more or less throughout the treatise :—

"*8. Schedule of Implements and Instruments.*

Purpose for which used.	Instruments.
The measurement of land.	Chain arrows and drop arrows.
	Offset staff.
	Steel bands and linen tapes.
	Pedometer.
	Passometer.
	Perambulator or viameter."

Another useful feature is to be found in the description and enumeration of the parts common to different instruments, and thus a good deal of needless repetition is avoided. It seems rather a mistake to select for illustration the least satisfactory form of adjusting device for instruments supported on tripods. The old-fashioned four-screw adjustment has the great disadvantage that a sensitive bubble cannot easily be levelled up by its aid so as to remain in the centre of the rim. This difficulty is owing to straining of the screws when moved in or out to any considerable extent, and we certainly think a few words of caution should be included in future editions for the guidance of beginners. In describing levels the author favours the dumpy type, as being more handy than the Y for general use. This preference is easy to understand in a country like our own, where instruments can be sent at any time to the makers for adjustments that cannot be performed by the operator, but in the colonies and some foreign countries it is desirable that the mode of construction should be such as to permit testing and adjusting to be carried out by the surveyor or engineer. The improved forms of levels introduced with the object of complying with this condition are not noticed by the author. We are pleased to observe that in his illustrations of levelling instruments Mr. Skrimshaw indicates the tribrach stand instead of the time-hallowed adjustment above mentioned. A still better arrangement is the ball-levelling joint, permitting the level to be set 15 deg. to the inclination of the tripod independently of the screw adjustment. The form of levelling-staff illustrated, and said to be "most generally preferred," is one specially devised by Mr. Stanley for his point index. It is true that this is fairly popular, although, to be strictly accurate, the form of reading originally devised by the late Thomas Sopwith is still more used than any other. As an instrument likely to remain in favour with land surveyors in Great Britain, the theodolite is more amply treated than some of the other appliances

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described. It is somewhat difficult to explain on paper owing to the complicated nature of its refinements. By first describing and illustrating a rudimentary instrument, the author succeeds in imparting a very clear notion of the leading features of the theodolite, and the reader is thus prepared for the complete description that follows of its details, purposes, adjustments, and uses in practice. The box sextant is mentioned at some length in the same chapter, and deservedly so, for on fairly level ground this is a valuable and sufficiently accurate instrument for taking both horizontal and vertical angles. The remaining chapters in this portion of the book relate principally to drawing instruments, and present no features calling for special comment.

Chap. xii. serves as a sort of introduction to the technical discussion of surveying which occupies nearly all the remainder of the treatise. It contains a concise series of technical definitions, statements of the main purposes for which a survey may be made and of the order to be followed, a general outline of the principles of triangulation, and a set of plates reproduced from a field book. By the adoption of this course the ground is cleared very considerably, and the student is prepared to enter upon his work with a sufficient amount of preliminary information. In treating of the measurement of land by chaining, the author describes the ordinary mode of procedure and indicates the steps necessary when obstructions are encountered. Several examples illustrated by diagrams are set forth in so clear and practical a way, that the beginner should have little difficulty in making himself tolerably proficient after a little practice in the field. Much more time must be spent in field work before he can be competent to carry out a complete chain survey, although such an operation may seem to be quite a simple affair as shown by plans and explanations on paper. In suggesting the methods to be adopted, the author employs the tabular form of statement, and then proceeds to give the details of an imaginary survey. Although the example is described as a chain survey, it should be noted that all angles formed by the principal lines are to be read by the theodolite, the use of which was indicated in a previous chapter.

After the field book has been completed, a good deal of work remains to be done in the office. Accordingly the author is led into the writing of several chapters dealing with plotting, the computation of areas, the methods of laying out land, and the apportionment of lands. In entering upon the principles and practice of levelling, Mr. Skrimshaw adopts his system of defining in brief paragraphs the various technical terms applicable in that branch of work. Then follow some general observations upon the art of levelling, expressed in language so simple that the beginner might be excused if he imagined there could be little more to learn. Whilst this would, of course, be an entirely mistaken idea, it is the fact that what remains to be learnt is much more readily appreciated because the reader is better able to grasp the meaning of his mentor, by reason of the preliminary knowledge imparted. Although the treatment of this part of the subject is by no means exhaustive, it appears to be sufficient for enabling candidates to qualify themselves for the examinations specially in the view of the author. Traverse surveying is treated in the succeeding chapter, and here we touch the fringe of the more scientific methods adopted in engineering practice. As a combination of linear and angular measurements, traversing is particularly applicable to boundary surveys, to the survey of roads and rivers, and especially to cases where the measurement of lines across the land would be impracticable. The examples presented by the author refer more especially to the closed traverse, in which operations are completed at the original point of departure, but as the surveyor must frequently have occasion to deal with long, narrow, and winding tracts of country, some detailed instructions as to the mode of procedure in such cases could be usefully incorporated in the treatise. We notice it is said that "traversing may be performed by (*a*) the theodolite, (*b*) the prismatic compass," and this remark appears to be insufficiently qualified by the caution that the former should always be used when great accuracy is required. As a matter of fact, the compass is naturally delicate and liable to get out of order, and other demerits render its use in surveying undesirable, except for filling in details after the theodolite. Methods of setting out curves form the basis of the next chapter, the most generally accepted form—that of the circular arc—being alone considered. Two methods are explained—one by offsets and the other by angles—or, as the author describes them, "with the chain" and "with the theodolite." If the former mode of work could be followed with absolute accuracy, the final offset would cut the corresponding tangent as desired. Such a result seldom occurs in practice, except by accident; consequently, a tedious succession of trials becomes necessary until errors have been sufficiently eliminated. The angular method is far more elegant, and is the only one by which circular curves can be set out expeditiously and correctly. Sometimes a curve joining two lines may be partly inaccessible, or the points of junction may be so, and then special treatment is necessary. Contingencies of the kind have not been anticipated in the volume before us, and we think that examples suitable for these and other conditions should be included for the complete guidance of the student. Chapters on logarithms and the solution of triangles conclude the treatise. Of course, neither of these subjects necessarily belong to a work on surveying, as they may be studied by the aid of separate text-books. The object of the author has been to equip his student readers with the requisite information for following out all the other teaching conveyed, and the two chapters are well adapted for this purpose. An appendix contains various useful tables, miscellaneous information, and a sample set of examination papers as issued by the Surveyors' Institution.

Although Mr. Skrimshaw's work cannot be described as a profound or complete exposition of the whole subject, yet it possesses a distinct value of its own, and should be of considerable service to those desiring to acquire sound and reliable knowledge of ordinary surveying operations.

Ripon: The Cathedral and See. By CECIL HALLETT, B.A. London: George Bell & Sons. 1901.

MR. HALLETT has produced a conscientious little book on the minster church of Ripon. No claim is made to originality of treatment or of views, but his indebtedness to almost all previous writers on the great church, from Canon Fowler down to some modern guide-books, which he had better have eschewed, is fully acknowledged. Indeed, if Mr. Hallett had more opinions of his own, or tried to arrive at some conclusions on puzzles, the book would have been clearer and more readable. As it is, those who know the church fairly well cannot help being rather confused by the diversity of statements put forth, whilst those who visit it for the first time with this book in their hands will, on several points, be left quite to their own judgment as to dates and probabilities. For instance, although Mr. Micklethwaite's conjectural plan and explanation of the crypt are given, other theories and views are woven into the letterpress after such an embarrassing fashion that it is not only impossible to realise what are Mr. Hallett's own ideas, but what all the differing statements as to square ends and apse ends, Roman or ultra-Roman, mean. We strongly advise Mr. Hallett to read and study the late Mr. G. G. Scott's masterly treatise on the "History of English Gothic Art," and he will then have clearer ideas of his own on the subject, and consequently be able to impart them to others. As to the old stone pulpit in the north transept, the short paragraph and note about it merely suggest a variety of theories as to date and original position. The fifty-three illustrations are mostly from photographs by Mr. Watson, of Ripon, and come out excellently. We are specially glad to see the clean picture of the twelfth-century vaulting of the north transept aisle. The picture of the exquisite fifteenth-century carving of the quire stalls is another good one; but is not the photograph of the reconstructed angle of the great tower somewhat out of focus?

The history of the church, apart from its description, which occupies the first thirty-seven pages of the book, is well told after a concise fashion. It adds much to the value of the book that a plate is given of the striking and in some ways beautiful west front of Early Perpendicular date, unfortunately cleared away in the 1862-70 restoration. The descriptive part of the book fails in lack of explanation of the extent of the various Victorian alterations. The high altar was then removed to the easternmost arch, thus destroying the old processional path.

Llandaff Church Plate. By GEORGE ELY HALLIDAY, F.R.I.B.A. London: Bemrose & Sons.

THIS is a remarkably good and clearly-compiled book on the church plate of the diocese of Llandaff, that is of the counties of Glamorgan and Monmouth. Mr. Halliday is much to be commended in having refrained from giving a long general introduction on the question of old church plate in general, and of English in particular. This has been already done far too often by the compilers of lists for other counties. Mr. Halliday's diligence in searching out and describing the church plate of all the parishes in these two counties—many of them in out of the way districts—has been rewarded by bringing to light many interesting examples. There is only one piece of pre-Reformation plate left in the diocese, and that is the paten now in use at Llanmaes, Glamorgan, which has not previously been chronicled or illustrated. The hall-marks undoubtedly point to 1495 as the date; in the centre is the vernicle, or face of our Lord. The diocese possesses about seventy-five examples of chalices of the Elizabethan period, many of them with their paten-covers still remaining. Some of them are of unusually good design; the best of those with the ordinary foliated strap work pattern is that at St. Michael's Church, Risca, Monmouth. It bears the date 1573 on the paten-cover. At St. Mary's, Monmouth, is a grand piece, hall-marked 1591, which is quite unique as a chalice. The cover takes a spiral form and is richly embossed; it is much like a standing cup (1598) belonging to the Armourers' Company. Mr. Halliday seems to doubt it having originally been a secular cup because of the shape of the bowl; but it is quite impossible that a church cup at such a date could have been designed with a cover of this kind. There are several most interesting Commonwealth specimens, as well as some double-handed porringer-shaped cups of later date and similar origin, and also a few with the heraldic bearings of their donors. Nor has Mr. Halliday forgotten to take note of the old pewter still scattered about in the rural districts of the diocese.

Among other useful though rather painful results of putting on record such a catalogue as this is the exposure that is made of the poverty-stricken character of much of the "plate" (?) now in use in the diocese. It is distinctly discreditable to the diocese that upwards of twenty churches, and several of them in towns, only use Sheffield or other kinds of plated silver. In one parish, that of Tonyrefail, the only vessels are of pewter. In two other cases they are of "white metal." At Cwmcarn, Monmouth, it is said that "the vessels belonging to this church are of glass;" whilst at Bettws St. David, in the same county, the vessels are "a chalice, paten, and flagon; brass, tinned inside."

The illustrations supplied by Mr. Halliday are numerous and excellent of their kind, whilst the typography and arrangement do credit to the publishers.

A Theoretical and Practical Treatise on Oblique Bridges in Stone and Brick. By FRANCIS CAMPIN, C.E. London: The Publishers of the *Railway Engineer*.

THE little book suffering from this formidable title is an interesting chapter on the subject of oblique bridges, but it has neither the form nor the method of a treatise, in the ordinary acceptation of the term. After a few general observations upon the conditions necessary for stability in masonry and brick structures, the author proceeds to show the method of preparing the drawings from which to build a skew arch. The demonstration occupies about thirty-four pages, or nearly three-fourths of the whole essay, and is based entirely upon one example taken from actual practice, in which the section of the arch on a line at right angles to the axis forms a segment of a circle. Such a section necessitates the use of skew backs shaped so as to fill the triangular spaces resulting from the oblique intersection of the bed-joints with the line of springing. The author does not mention the fact that this treatment is unnecessary if an arch springs vertically from the abutments in such a way that none of the bed-joints intersect the line of springing. We notice he implies that the bed-joints should be

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spirals winding around the axis of the arch. This is correct so far as practice is concerned, although it must be remembered that spiral joints are merely adopted as an approximation, because joints of the correct form are difficult of execution. No mention whatever is made of the ribbed skew-arch, a method of construction usually followed in the United States, and sometimes adopted in this country. It certainly ought to receive notice in a work professing to be a treatise. With the exception of six lines referring to brick arches, the whole of the book is devoted to stone bridges. An improvement would be effected if the various steps to be taken in the preparation of the drawings were arranged in consecutively-numbered paragraphs, and it might also be convenient if practical hints on constructional details, templates, and gauges were separated from the demonstration of theoretical principles.

Practical Mathematics for Beginners. By Frank Castle, M.I.M.E. London: Macmillan & Co., Limited. 1901.

Like a previous work by the same author, termed "Elementary Practical Mathematics," the volume under our notice is intended for the assistance of students attending classes where the syllabus of Practical Mathematics issued by the Board of Education forms the basis of the lessons. The plan of the book is admittedly due to the inspiration of Professor Perry, who, it is well known, seeks to place the teaching of mathematics on a practical basis. His views were put forward at the recent meeting of the British Association, and met with a good deal of support from those present, although allowance had to be made for the unmathematically humorous terms in which they were expressed. The particular mode of teaching mathematics advocated is rapidly growing in popularity, but, as Mr. Castle admits, the subject is in a tentative stage. This condition probably accounts for the recent revision of the syllabus by the responsible authorities, and incidentally for Mr. Castle's present book, which might very well have been described as a revised edition of his former work. Judging by the preface, the "tentative stage" appears to exist also for the author. In his former treatise it was said that the inability of students to profit by technical instruction given in polytechnics is largely due to insufficient preliminary training in mathematics. Now we are told that engineers and artizans can be given a mathematical training through the agency of their daily work, and preliminary training upon academic lines is said to be unsuitable for the practical man. We are rather afraid that the author has been taking some of Professor Perry's hyperbolical language in too literal a sense, for to suggest that engineers and artisans can be conveniently trained through the agency of calculations made in the course of work is about as reasonable as to propose that authors should learn spelling and grammar by the aid of the books they write. Of course, every one who is wise will continue to learn as long as he lives, but the value of preliminary training must not be depreciated. In the body of his useful and carefully considered work, Mr. Castle provides adequately for those in want of this preliminary training, thus affording another proof of the adage that "example is better than precept."

Illustrations.

DESIGN FOR THE ARCHITECTURAL TREATMENT OF VAUXHALL BRIDGE.

In a paper a year or two ago at the Institute of Architects on "The Architectural Treatment of Engineering Structures," the question of the treatment of Vauxhall Bridge, which was then attracting so much attention from architects, was touched upon, and I appended to the paper a small elevation and section, of very simple and plain character, merely showing the principle of treatment by which, accepting the engineer's arch-lines and parapet line as conditions imposed, the bad effect of the very thin crown of the arch might be minimised by the reduction of the cornice to a corbel-table, and carrying the voussoir lines right up to this over the whole surface of the arch masonry. In the same small drawing a buttress form of treatment, different from that which has been usually employed in large bridges, was suggested.

It has been a matter of some interest to me to try what could be done with this skeleton idea, when worked out into a more complete and architectural form, and I endeavoured to do this, though somewhat hurriedly, in the geometrical drawing published in this issue, and which was prepared and exhibited at the last Royal Academy exhibition. The perspective view which is also published in this issue was made subsequently in order to try the effect of the design in perspective.

As far as Vauxhall Bridge is concerned, at the stage at which the work has presumably now arrived, the interest of the design may be regarded as of purely theoretical or academical character; a fact, however, which removes one objection to its publication. As an attempt to deal with the problem from a new point of view, it may not be without interest to architects; and if any engineers condescend to look at it, it may also serve, at all events, as an explanatory diagram to make clear some points which it is not very easy, in general, to get engineers to enter into.

It must be remembered that this is a design for facing with granite a concrete bridge, and the object of the treatment of the voussoirs is partly to suggest this idea. In the original design of the County Council engineer a great point was made of having a large cornice (very badly profiled) and a very heavy course of rusticated voussoirs, with the idea of imparting "power" to the design, as if this rusticated arch were the main element in the stability of the arch. Instead of this, the stability of the arch really resided in the concrete construction behind the granite, and the rusticated voussoirs were not only a sham expression of the structure, but really an unnecessary weight added to it. A further æsthetic result of the large cornice and the large voussoir course was that, owing to the narrow limits left between the crown of the arch and the road line, the cornice and the voussoirs were crushed up together at the crown in a most clumsy manner, the voussoirs shorn of nearly all their depth and apparent stability and reduced to mere squares of masonry, and the appearance of the crown of the arch hopelessly weakened. In fact, a worse piece of design in masonry has seldom been seen. It is to be hoped that in execution, at all events, there is to be some improvement on this.

The idea in the treatment of the arch face in my design was this: by reducing the cornice to a corbel-table of moderate proportions a greater height and a better proportion is left for the centre voussoirs. By carrying out the voussoir treatment throughout, and by slightly recessing each alternate voussoir and treating it in a decorative manner by fluting it, the idea of its being a flat *revêtement* and not an important constructional arch is conveyed, or is meant to be; and the alternate thinner and thicker proportions of these voussoir courses show, on the soffit of the arch, as an effective margin to the concrete surface, and as toothed into the concrete in a manner that suggests the coherence of the whole structure. The voussoir facings might perhaps very well have been thinner than they are shown in the drawings. Heraldic escutcheons surrounded by wreaths are introduced as an appropriate and effective manner of relieving the wide surface at the haunches of the arch.

The treatment of the pier would be as applicable to a purely masonry bridge as to a concrete structure faced with masonry. It represents the face of the pier treated as in my opinion it always should be treated, as a kind of buttress, not as a feature designed to support vertical weight, as it almost always is treated. Indeed, this is the only design for a bridge on a large scale that I have ever seen, in which this buttress principle has been adopted or suggested. Although the decorative details are classic in type, the treatment of the centre projection carrying the lamp-standards, and breaking out as a projection from the lower face of the buttress, is really suggested by Gothic rather than Classic associations.

Some people seem to have an idea that it is a rigid rule to have the lamp-standards over the centre of the arch, and when my first sketch of the idea was published in the Institute *Journal*, some wiseacre was good enough to tell me in print, with an air of authority, that I had got the lamp-standards "in the wrong place." If he had known anything about the subject he would have known that, as far as Thames bridges are concerned, the authority as to the right or wrong place for the lamp-standards in a practical sense, is the Thames Conservancy, whom I consulted in the matter, and who sent me a long letter going into the whole subject, the broad conclusion of which was that there were precedents on the Thames bridges for both positions; that they were rather uncertain at present which was really preferable, but that their opinion on the whole was in favour of having the lamp-standards over the pier rather than over the arch. In an architectural sense there can be no doubt that the best position for the lamp-standards is over the pier, where they can form the culminating point of an architectural base or pedestal. In the present case this is emphatically so, because the weak point of the bridge, on the engineering lines, is the want of depth at the crown of the arch, and the position of a large lamp-standard there would appear to emphasise this defect by adding weight just where the structure looks weakest.

Another point in the design to which I may draw attention for a practical reason, is the nature of the crown moulding or finish to the rusticated cut-water pier, which is formed by a series of recessed fillets, so as to avoid any projection under which any part of a boat might be caught, with a rising tide. This is not an imaginary danger.

It may be added that the tone-block reproduction of the perspective does not quite truly represent the actual values of light and dark; foreground cutwater buttress should be a good deal darker under the arch; and on the other hand the shadow of the central projection of the buttress, for some reason, has come out much too black. Tone-block reproduction is a rather capricious process, and one never quite knows how it will deal with lights and darks in a drawing. H. H. S.

DESIGN FOR BRIDGE OVER THE WEY, AT GUILDFORD.

We must regret that this sheet of drawings does not represent a bridge that has been or is to be carried out, as the Guildford Corporation eventually determined, it appears, to erect an iron bridge. The design however is of considerable interest as an example of an architect's treatment of a small bridge in a country town, and shows also that in such cases it is possible to find an architect who can dispense with the assistance of the engineer, as the author's business-like structural details indicate. The treatment of the lines of the parapet is very graceful, and the balustrade and other details show a departure from ordinary precedent. The following is Mr. Ricardo's note on the design:—

"The bridge at the foot of the High-street at Guildford was partially destroyed in the winter of 1899-1900 by some stacks of timber drifting loose owing to a violent and sudden flood, and getting jammed in one of the two effective archways. As the waters rose the timber prised up the arch from underneath—a very unexpected form of accident. The bridge originally was a mediæval five-arched stone structure, built to supplement the ford, but in time the encroachments of the town absorbed two of its arches. About one hundred years ago, owing to the increase of traffic, the bridge was nearly doubled in width by brick arches springing from the abutments and sterlings on one side. A further increase of width was obtained subsequently by carrying the footway on iron cantilevers.

The proposals before the Town Council were three:—

1. To retain as much of the existing structure as possible, and to bridge over the gap with a masonry arch, using the existing abutments.

2. To make a new bridge in concrete faced with brickwork on fresh piers and new abutments, and so increase the waterway; and

3. To make an iron structure, going from bank to bank, and giving a waterway clear of all obstruction.

This last scheme is what has been eventually adopted by the Town Council.

In the scheme illustrated the difficulties that had to be met with were those of height, and that the axis of the bridge was not perpendicular to the axis of the stream. It was required that the roadway of the new bridge should not rise so steeply as that on the old bridge, whilst the height above the water-line should be increased for the accommo-

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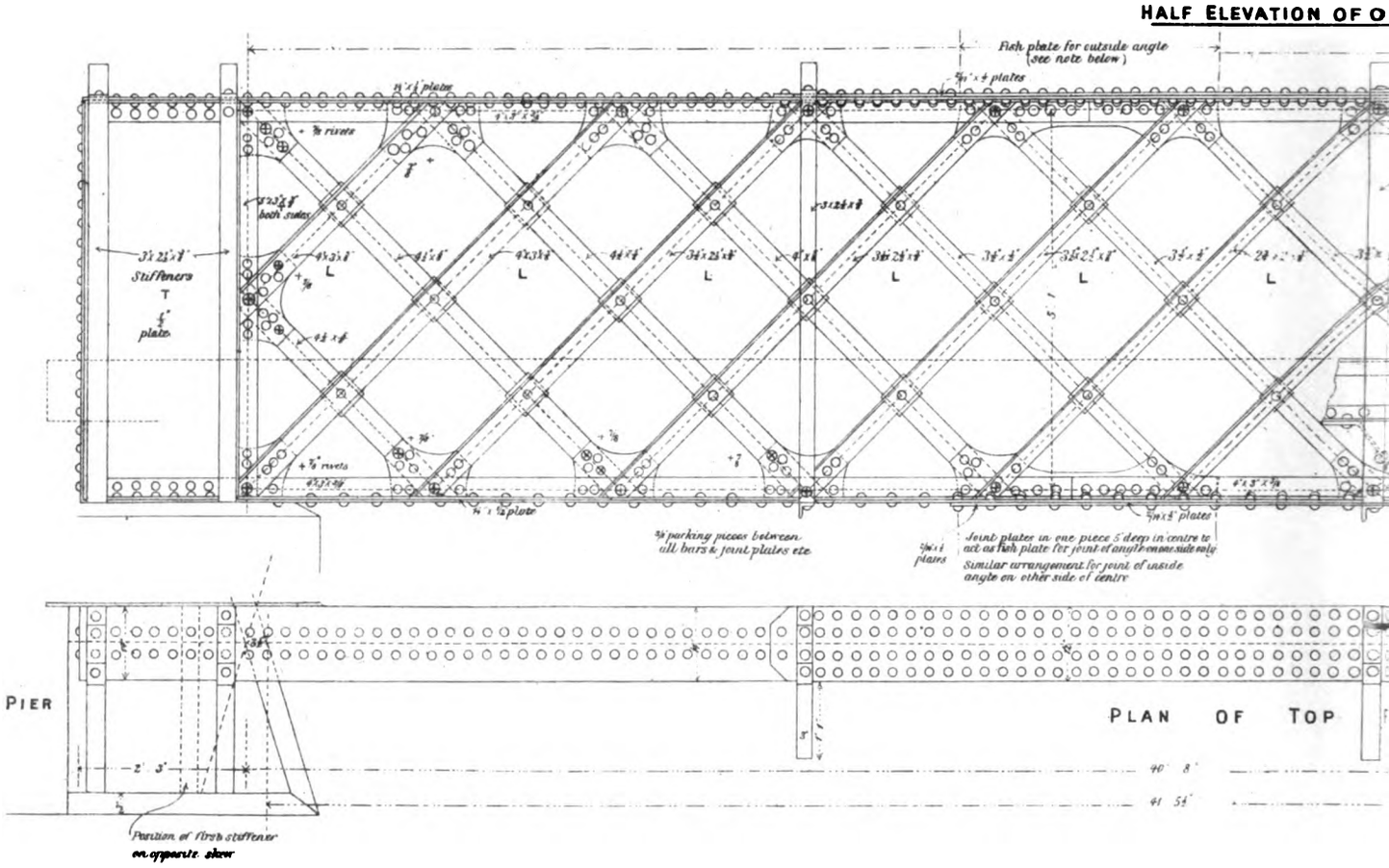
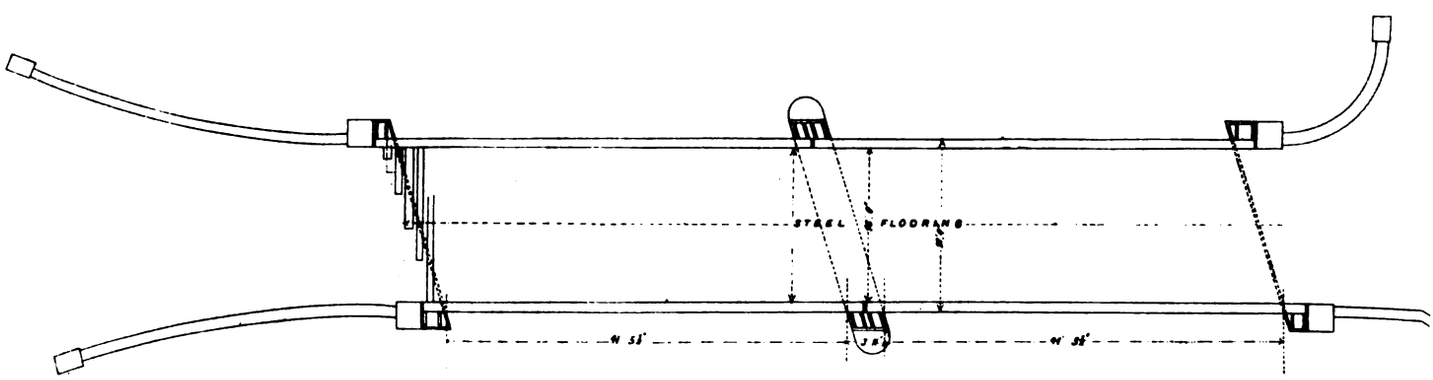
COUNTY OF SO

BREAMORE GRE

PROPOSED RECON

HALF ELEVATION OF O





PLAN OF NEW BRIDGE

SCALE

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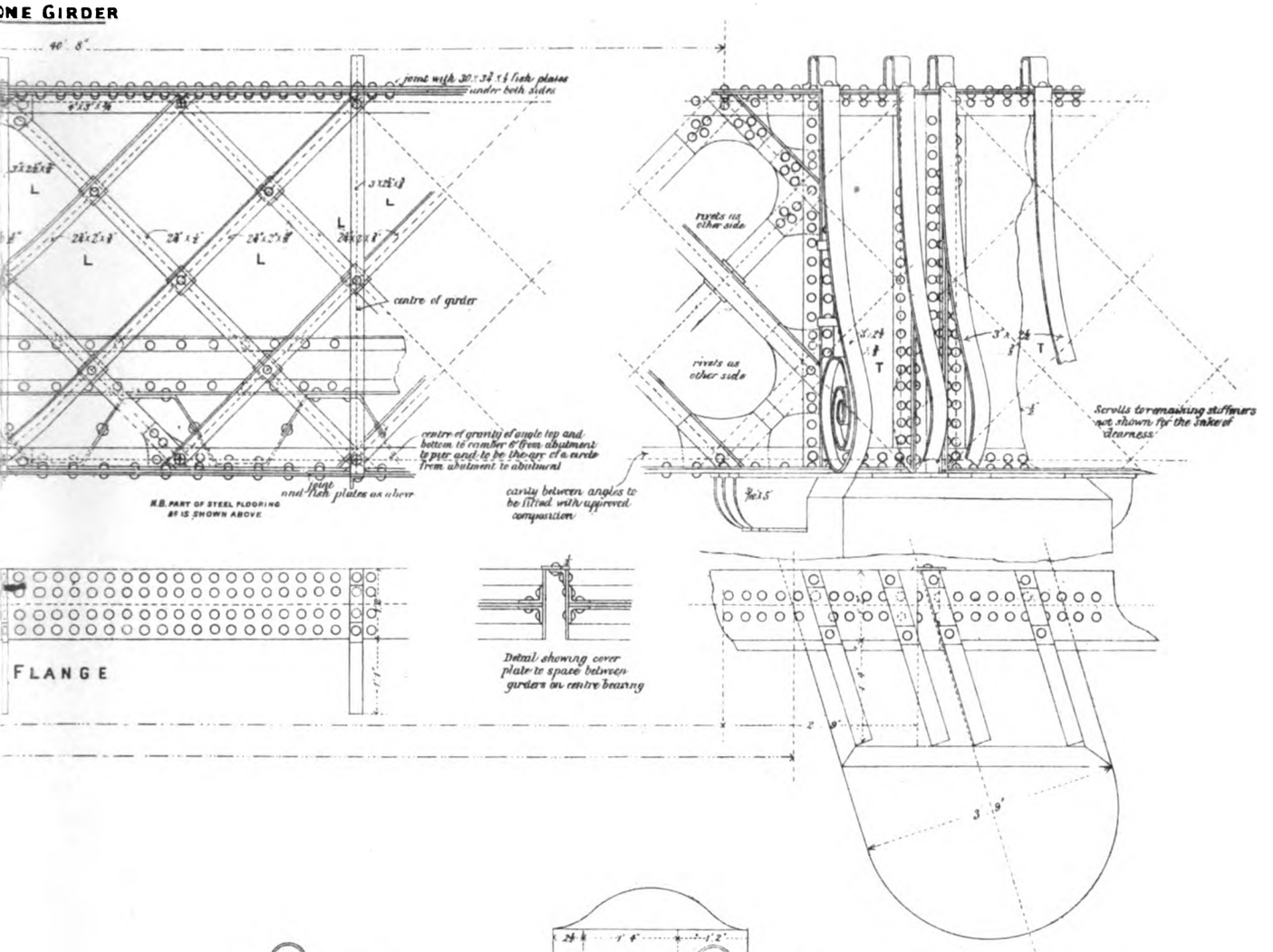
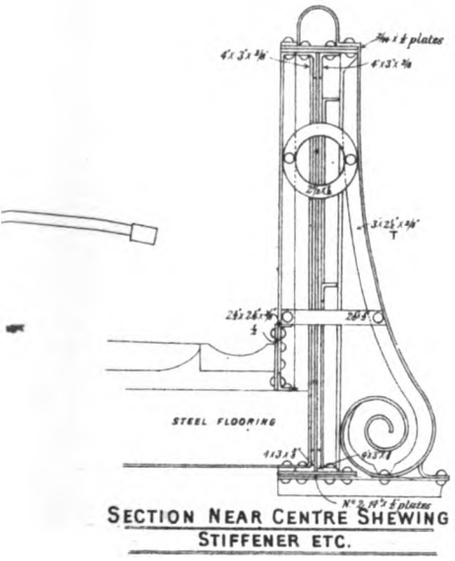
U THAMPTON
E AT BRIDGE

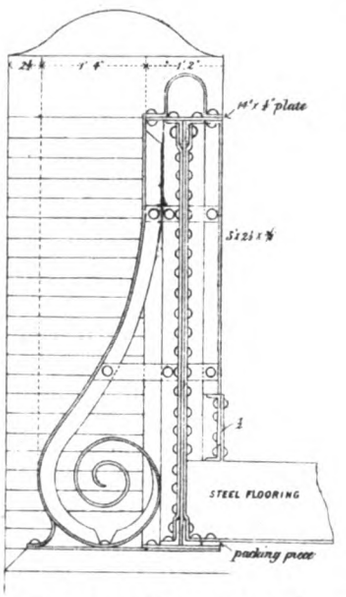
STRUCTION

ONE GIRDER





SECTION NEAR CENTRE SHEWING STIFFENER ETC.



SECTION SHEWING STIFFENER AT BEARING
DIAGONAL MEMBERS NOT SHEWN

PLAN AND ELEVATION OF DOWN STREAM CUTWATER AND GIRDER BEARING

W. J. Taylor
COUNTY SURVEYOR
THE CASTLE,
WINCHESTER
October 1901

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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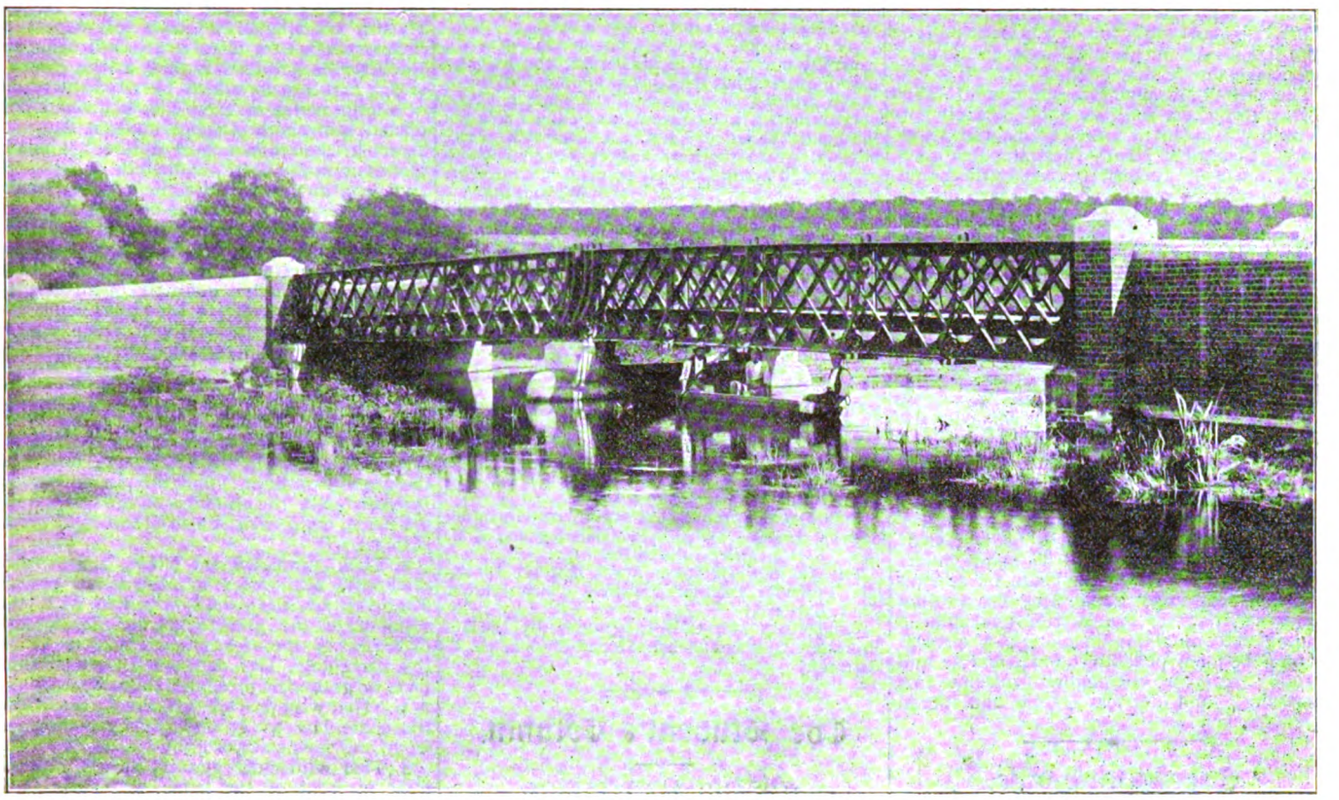

Breamore Bridge. Mr. W. J. Taylor, Engineer.

dation of barges laden with hay, timber, &c. The skewness of the piers was proposed to be masked by carrying the footway on arches perpendicular to the main axis of the bridge, starting from corbels on small abutments rising from the cutwaters, the spandrels to be filled in with local (Bargate) stone, the balustrade and parapet to be made of Purbeck, the bricks to be thin red paviors well fused by hard burning. The main mass of the structure to be of Portland cement concrete.

The builder's estimate for removing the damaged structure and erecting the new one as shown, exclusive only of metalling the roadway, was 5,500*l.*

HALSEY RICARDO."

BREAMORE BRIDGE, HAMPSHIRE.

THIS "county bridge" is situated in the west of Hants, about eight miles south of Salisbury, and carries the district road from Breamore to Woodgreen across the River Avon. The new bridge, just erected by the County Council, replaces an old wooden structure which has spanned the river at this point since the year 1846, up to which date passage was obtained by a ford only.

The new bridge consists of two spans of 41 ft. 5½ in. each, with a clear width of roadway of 16 ft. The girders are of the lattice type, and built of English steel; the roadway is carried on corrugated steel sections, spanning from girder to girder and rivetted to their lower flanges. These sections are covered with tar concrete, on which the ordinary road metalling is laid.

The pier and abntments are of red brickwork and concrete with Swanage stone templates and dressings.

The bridge is calculated to carry the heavy traffic of the present day with the usual margin of safety.

It will be noted that the girders, forming an arc of a circle from abutment to abutment with a 9 in. rise in the centre, are fixed clear of all masonry and brickwork so that all parts may be as far as possible easy of access for painting and inspection, and the lines of construction show themselves and preserve the simplicity of the work. The outside members of the stiffeners are scrolled and looped up over the top flanges of the girders.

Separate tenders were invited for the steel superstructure, and the girders were made by the Thames Ironworks and Shipbuilding Company, who, notwithstanding the additional trouble involved by some parts of this small work varying from the usual practice, took the greatest pains to faithfully interpret the drawings. The substructure was satisfactorily carried out by Mr. F. Osman, of Southampton, and the foundations being in shingly gravel gave some trouble.

The bridge was designed by Mr. W. J. Taylor, the County Surveyor of Hants.

TRADE CATALOGUES.

MESSRS. JAMES TRUSCOTT & SON, of London, send us a copy of "The Engineering Price List," which is said to be "the recognised medium for shippers and export merchants." It is difficult to know why the volume should be called a "price list," inasmuch as, with the exception of the index, it consists entirely of advertisements, very few of which include prices. Although the book does not appeal particularly to the bulk of our readers, it may well be useful to firms desirous of ascertaining suitable sources of supply for various classes of machinery and engineering materials.

We have received from Messrs. Barford & Perkins, engineers, Peterborough, a copy of their catalogue of "steam cooking, heating, and laundry appliances." The cooking section contains illustrations of boiling pans, vegetable steamers, ovens, boilers, and other apparatus required in the kitchen departments of large buildings. A statement of the fittings required for various numbers of persons will be of service. The laundry section contains illustrations and descriptions of Washington Lyon's well-known steam disinfecting apparatus, in addition to laundry and washhouse machinery and fittings. The catalogue might with advantage have been extended. The descriptions are too meagre to be of much service, and the sizes of the different apparatus are, with few exceptions, left to the reader's imagination. No doubt fuller information can be obtained "on application." A list of important works fitted up by the firm is given in the catalogue, together with a number of testimonials.

The Bon-Accord Acetylene Gas Company, of Aberdeen, send us their new catalogue of appliances for generating and utilising acetylene. The price of a generator, with purifier and all the generator adjuncts, is quoted at 15*l.* for one of sufficient size to supply ten 25 candle-power lights for nine hours, 50*l.* for one to supply sixty lights, and 130*l.* for one to supply 160 lights. The company state that they have fitted a large number of steamships with acetylene installations, and that the generators have been found to work satisfactorily in all weathers. For harbour and railway works, and for contractor's work in general, portable lamps of high candle-power and convenient form are manufactured. The calcium carbide required for the generation of acetylene must not be stored in larger quantities than 5 lbs. (in separate 1 lb. tins) without a licence from the Local Authorities; but the company undertake to procure the necessary licence for their customers when required, the cost of which is 5s. per annum.

Messrs. J. H. Sankey & Son send us their new general illustrated catalogue, which comprises three sections—sanitary goods, bricks and tiles, and fireclay goods. Their stoneware pipes have been tested at Kirkaldy's, and it is stated that the 4 in. 6 in. and 9 in. sizes have stood an average test of 4,000 lbs. The catalogue of course includes all kinds of pipe junctions and bends, and they note a novelty in connexion with this class of work, in the shape of an interceptor with a spirit-level attached, to ensure level seating. There are some good sections of pedestal closet, though the one called the "Trent" we cannot recommend in consequence of the shallowness of the standing water in the basin. The porcelain enamelled fireclay lavatory range is an excellent article of its class. The catalogue includes enamelled and salt-glazed bricks, fire-bricks, &c., as well as their "Purimachos" fire-cement, which is stated to be capable of withstanding a greater heat than that necessary for the fusion of iron. A very large number of stock sizes of fire-bricks and tiles are kept in stock. The firm should, however, get some better designs for their "red finials," garden vases, &c.

The General Iron Foundry Company send us a large illustrated price-list of their ranges, stoves, mantel registers; iron, wood, and marble mantels; steam cooking apparatus; baths, lavatories, and closets; sanitary castings; soil and rain-water castings; general castings, and stable fittings and hot-water goods. The catalogue illustrates a great variety of ranges, large-size, cottage, portable, and ship ranges, and a set of directions for the best fixing of ranges. Of the large variety of grates illustrated, many are over-ornamented, and though we cannot afford space to particularise them here, the firm may be assured that, in a general way, it will be the plainer ones and not the ornate ones that will please the best architects and the best class of customers. Most of the iron mantels, too, are behind the day in point of design, and the firm would find

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t worth their while to go to one of the artistic architects who have given attention to design of this class, and get a superior class of designs from them. All the practical work in the catalogue seems to be very good.

The Crittall Manufacturing Company (Manor Works, Braintree) send us a handsomely got-up folio catalogue of iron casements, sashes, doors, gearing &c. They illustrate their casements in a most practical manner, by numerous full-size sections of the working parts, which show what good provision is made for rain-tight qualities. There are full technical illustrations, also, of the Crittall "Safety" casement, capable of being reversed for cleaning. The malleable iron handles and casement stays show variety and very good character of design. The catalogue includes elevation drawings of sashes for various purposes, sash gearing, sliding doors, wrought-iron roofing, &c. It is a useful and practical catalogue, well illustrated and in the right way—for use rather than show.

Messrs. George Anderson & Co. (Carnoustie, Dundee) send us, through their London agents, Messrs. M. Powis Bale & Co., a short illustrated list of their stone-working machinery and contractors' plant. These include their patent diamond saw, with diamond cutters electrically welded into the blade, for sawing sandstone, limestone, marble, &c.; also a swing frame saw, a rotary disc polishing machine, a planing and moulding machine; a circular rubbing bed for polishing stone, marble and granite; a stone channelling machine for quarrying; and derrick cranes and aërial ropeways.

Correspondence.

To the Editor of THE BUILDER.

PRODUCTS OF GAS BURNING.

SIR,—Your able contributor, in the thirteenth section of his series of articles entitled "Gas and Gas Fittings," states, at p. 275, that one of the objections to the use of gas is "(3) . . . . the formation of carbon dioxide" (carbonic acid gas=C.O.²). Now, the Bunsen or atmospheric burner, in which air is mixed with the gas before combustion, and which gives a blue flame with much heat and but little light, produces mostly, not carbon dioxide, but the more deadly poisonous carbon monoxide.

As the incandescent burner is primarily an atmospheric burner, and gives off the deadlier monoxide before the mantle is placed in position, I would be thankful to be informed distinctly and authoritatively whether the incandescence produced by the mantle has the effect of transforming the product of combustion from mainly carbon monoxide to mainly the comparatively less harmful carbon dioxide. If that is so, the result is not more prejudicial to health than the use of ordinary flat-flame and argand burners. Am I right in so assuming? A. H.

*** When the gas is burning under normal conditions the Bunsen or atmospheric burner does not produce carbon monoxide in the ultimate products of combustion. Carbon monoxide being a combustible gas, any volume of this product of incomplete combustion which may be formed within the flame is oxidised into the comparatively harmless carbon dioxide before it can escape from the outer zone of flame. The products of combustion evolved from an incandescent burner are not affected by the presence or absence of the mantle. A false alarm was raised in 1894 by M. Gréhant, who contributed to the *Comptes rendus de l'Académie des Sciences* the results of some experiments which he believed proved that a minute proportion of carbon monoxide was present in the product of combustion from incandescent burners. In a subsequent note contributed in the same year to the same journal he admitted, however, after experimenting upon a dog, that the use of the incandescent burner is not attended with any danger of poisoning by carbon monoxide. In view of the importance of the subject an investigation was subsequently made by the *Lancet* Sanitary and Analytical Commission, with the result that the commission reported (January, 1895) that no trace of carbon monoxide could be discovered in the combustion products from incandescent gas burners.

THE WRITER OF THE ARTICLES.

LONDON STREETS.

SIR,—The metal bins for the reception of gravel, sand, and the like, placed in the streets for roughing the roads when slippery, "have come to stay," but they are as ugly as they are useful. In these days of art applied to objects of daily use there is nothing to prevent these receptacles being made by a series of ornamental iron castings, like good old firebacks, and bolted together in segments, so that any size and shape could be produced to suit the position. I expect by the new improved American moulding machines now in use the cost would be found less than the present ugly ones.

As regards the roughing material, fine gravel is generally used. This is the hardest and toughest part of quartz flints, the remains after ages of wear. When crushed these produce the most powerful abrasive, which not only cuts away the roads, but the horses' shoes and feet. A somewhat softer material would probably answer better, such as granite and syenite chippings, or mountain limestone. W. BRINDLEY.

*** As to the first part of Mr. Brindley's letter, we confess that we do not see any particular suitability in surface decoration for gravel-bins, and should regard the proposal to make them "ornamental" with some anxiety. The best art in such a case is to give them the best form for their practical use.—ED.

BOOKS RECEIVED.

OLD DUTCH TOWNS AND VILLAGES OF THE ZUIDERZEE. By W. J. Tuyn. (T. Fisher Unwin.)

THE CEMENT USERS' AND BUYERS' GUIDE. By "Calcare." (E. & F. N. Spon.)

THE LAW RELATING TO GAS AND WATER. By John S. Will. (Butterworth & Co.)

FIRST STAGE BUILDING CONSTRUCTION (Organised Science Series). By Brysson Cunningham, A.M. Inst.C.E. (University Tutorial Press.)

THE LONDON BUILDING ACTS, 1894-98. By the late Professor Banister Fletcher. Third Edition (B. T. Batsford.)

VALUATIONS AND COMPENSATIONS. By the late Professor Banister Fletcher. Second Edition. (B. T. Batsford.)

The Student's Column.

GAS AND GAS FITTINGS.

14.—SHADES, CHIMNEYS, REFLECTORS, AND GUARDS.

FLAT-FLAME SHADES AND GLOBES.—Shades are usually placed around gas-flames to produce greater diffusion of the light, to prevent the irritation caused by exposure of the eyes to direct rays of light from the naked flames, and to give a more pleasing appearance to the apartment illuminated.

All shades (the term "diffusers" would be preferable) offer a certain obstruction to the passage of light, but the proportion of light obstructed varies according to the shape of the shade and the material of which it is constructed.

Mr. W. King found that when No. 3 fish-tail burners were employed, globes of different descriptions obstructed the passage of light in the proportions shown in the following table:—

	Loss of Light.
Clear glass globe	10·57 per cent.
Ground " "	29·48 "
Smooth opal "	52·83 "
Ground " "	55·85 "
Ground opal with painted figures	73·98 "

The obstruction exerted by glasses of different descriptions and thicknesses is shown in the following table of results obtained by Mr. F. H. Storer, and published in *Silliman's American Journal of Science and Arts*. He placed sheets of the various glasses at a distance of 3 ft. from the Argand burner (with ordinary chimney) in which the gas was consumed, and determined the loss of light in each case:—

Description of Glass.	Thickness of Glass.	Loss of Light.
Thick English plate.....	¼ in.	6·15 p.c.
Crystal plate	⅛ "	8·61 "
English crown	⅛ "	13·08 "
Double English window glass	⅛ "	9·39 "
Double German	¼ "	13·00 "
Single German.....	1/16 "	4 27 "
Double German ground	¼ "	62·34 "
Single German.....	1/16 "	65·75 "
Berkshire (Mass.).....	1/16 "	62·74 "
Berkshire enamelled*...	1/16 "	51·23 "
Orange coloured window glass	1/16 "	34·48 "
Purple ditto ...	⅛ "	85·11 "
Ruby ditto ...	1/16 "	80·62 "
Green ditto ...	1/16 "	81·91 "
A porcelain transparency	1/16 "	97·08 "

* Ground only on portions of its surface.

Mr. Storer thought that the percentage of light obstructed remained the same whatever the distance between the illuminant and the glass screen; but in the year 1881, the late Mr. Hartley contributed a series of papers on "Observations on Glass as an Obstructor and Reflector of Artificial Light," to the *Journal of Gas Lighting*, in which he gave the results of a long series of experiments he had conducted with both Argand and flat flames to ascertain the influence of different kinds of globes upon the light obtained in a horizontal and in a downward direction, and he found that the greater the distance between the flame and the glass, the greater was the proportion of light obstructed. Hartley's papers are worthy of careful study by manufacturers of gas shades, and the general conclusions he drew from the results of his experiments, and enumerated in the following order, may serve as a useful guide in the selection of shades for different purposes:—

Horizontal Lighting: Sheet Glass.

1. That ordinary sheet glass, apart from thickness, varies in its obstructive power to the passage of light. That the *percentage loss increases* with the distance of the glass from the flame, and *increases* also as the *light grows stronger*.

2. That ground sheet glass, apart from thickness, also varies in obstructive power. That the *percentage loss increases* with the distance of the glass from the flame, and *decreases* as the *light grows stronger*. That the percentage loss depends on which side, clear or ground, is presented to the flame.

3. That with flashed opal the losses follow the same law as ground glass for distance from, and for power of light.

4. That with clear glass as an *obstructor* of light in front of the flame, and clear glass behind the flame as a *reflector* of light, the reflected light reduces the *loss* to a degree dependent on the distance of each glass from the flame.

Globes.

5. That a clear glass globe obstructs light from an *Argand* flame, but increases the sensible light from a *flat* flame.

6. That globes of ground glass obstruct less light than sheets of ground glass. That the percentage loss *diminishes* as the light grows *stronger;* and is, for an average light, from 18 to 20 per cent.

7. That opal globes obstruct an amount of light equal to 33 to 65 per cent.

Overhead Lighting.

8. *That the amount of light yielded by a flame in an angular direction is much less than it yields in a horizontal direction.*

9. That glass globes with elevated or overhead Argand flames *reduce* the power of the light—clear globes, about 3 per cent.; ground globes, about 21 per cent.; and albatrine globes, about 23 per cent.

10. That glass globes with flat-flame burners, at a certain elevation and within a certain radius, *increase* the power of the light—clear globes, about 6 per cent.; ground globes, about 9 per cent.; albatrine globes, about 23 per cent.; and German opal globes, about 21 per cent.

11. That reflectors greatly increase the power of the light, within a radius dependent on the shape and size of the reflector; the range in the experiments being from 52 to 92 per cent.

12. That screens at the base of an Argand flame cause a reduction in the power of the light, whatever be the size and form of the reflector.

It is especially noteworthy that when the shades are used on overhead burners, as is usual in practice, the loss of light occasioned by their employment is not nearly so great as that indicated by the early experiments of King and Storer, who measured only the light obstructed in a horizontal direction.

The shape of the shades is a matter of considerable importance. Globes with narrow openings at top and bottom were at one time almost universally used, but are now recognised as the worst form of shades for flat flames that could be devised. The contracted openings cause the globe to act as a chimney, the heated air and products of combustion escaping through the small opening at the top of the globe cause a strong draught of cold air to be drawn through the narrow opening at the bottom and brought in contact with the flame, with the result that the flame is constantly

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flickering, and, owing to the cooling action of the current of air, emits less light.

In some cases the shade is made with a more open top, while the narrow opening at the bottom is retained. Such shades are less objectionable than those with a narrow top, but still cause flickering of the flame, and are not so good as those with an opening 4 in. or

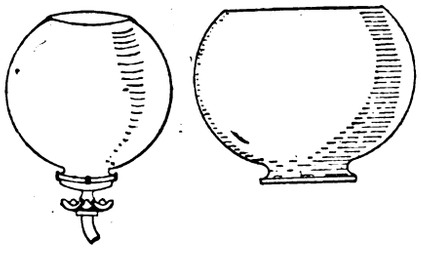

Fig. 32.—Flat-flame Shades of Bad Shape.

5 in. in diameter at both top and bottom. Two of the old forms of shade are shown in fig. 32, while more modern shapes, with large

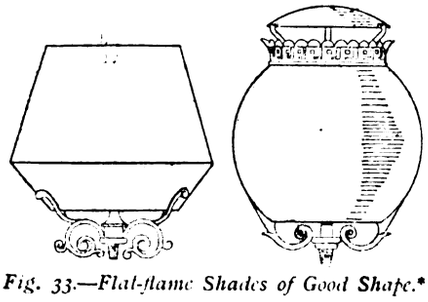

*Fig. 33.—Flat-flame Shades of Good Shape.**

openings at top and bottom, are shown in fig. 33.

Holophane Shades.—A new type of shade, designed by Psarondatri and Blondel, has been placed on the market under the name of the "Holophane" globe or shade. (Fig. 34.)

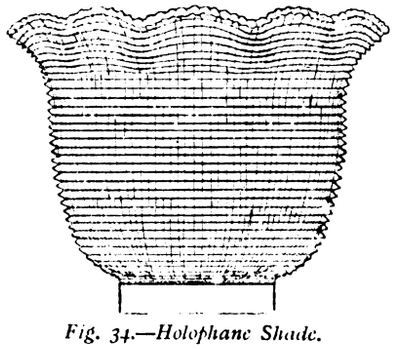

Fig. 34.—Holophane Shade.

The globe is made of clear glass, and the exterior side of the shade has horizontal prismatic lines running round it, while the interior has vertical prismatic lines. The horizontal prisms are moulded to deflect downwards some of the light which would otherwise be thrown against the ceiling, and thus more light is obtained in a downward direction when a holophane shade is used than when the flame or mantle is employed in a naked condition. The presence of the vertical prisms causes the light to be more evenly distributed over the shade than it would be if the horizontal prisms only were present. Professor Lewes has published the following table of results which he obtained with holophane and other shades placed over a Welsbach ordinary burner with chimney. The figures represent the average gain or loss of light due to the use of the shades when the objects to be illuminated are situated (as in ordinary use) at angles varying between the horizontal and 45 deg. below it :—

Percentage Gain or Loss of Light Due to the Use of Various Shades with a Welsbach Mantle.

Shade.		
Holophane—Tulip shape	Gain of	12·3 p.c.
„ Conical shape	„	13·1 „
„ Conical „ pink	„	1·1 „
White opal globe	Loss of	7·5 „
Ground glass globe	„	12·4 „
Frosted glass—Tulip shape	„	11·2 „
Frosted glass—Pink	„	23·2 „
Pink opal globe	„	34·1 „

* The expression "good shape" refers, of course, only to the practical suitability of the shape.

The Holophane globes do not, of course, possess the power of generating light, but merely deflect downwards upon the table and floor some of the light which would otherwise be thrown in an upward direction. They are manufactured in all shapes and sizes, and are equally suitable for use with coal gas and acetylene flames, or for incandescent gas lights.

"Jena" Bulbs for Incandescent Gas Lights.—Instead of using an ordinary cylindrical chimney with the Welsbach "C" or "York" burners, the chimney known as the "Jena" incandescent gas bulb, introduced into this country by Messrs. Falk, Stadelmann, & Co., may be employed. This bulb (fig. 35) has a number of holes around its lower circumference, which should be on a level with the top of the burner when the bulb is placed in position. Two or three holes are also made in the upper part of the bulb for the escape of the products of combustion. A small brass cone is slipped over the burner head and forms a base-plate for the bulb, so that no current of air can flow upwards to the flame. The air required for combustion (other than that drawn into the Bunsen tube of the burner in the usual manner) flows to the flame in a lateral direction, through the side holes. The bulbs are manufactured at Jena of a glass capable of withstanding great heat and sudden changes of temperature without injury.

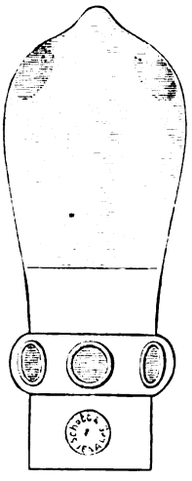

Fig 35.—Jena Bulb.

It is usually found that an appreciable increase in the intensity of the light emitted by the mantle is obtained by adopting this device, and the mantle is protected from draughts and dust to a greater extent than when chimneys of ordinary shape are used. Glass screens are manufactured in a variety of patterns to surround the lower part of the bulb, and the bulb has then a very pleasing appearance. These "Jena" bulbs are not, of course, intended to be used with the chimneyless burners.

Chimneys.—Chimneys are required with Argand burners and with certain descriptions of incandescent burners, because the flames from these burners would otherwise be of long, irregular shape and would be too unsteady for lighting purposes. The gas issuing from the burner-head under low pressure does not induce sufficient air to flow towards it to cause oxidation to proceed with the required speed, and the flame becomes elongated owing to the greater distance it has to travel before meeting with the volume of air necessary for complete combustion. Immediately a chimney is placed upon the burner an upward current of air comes in contact with the flame, and causes combustion to take place more readily, with the result that the flame becomes shorter and more rigid. The proportion of light obstructed by glass chimneys varies with their thickness and colour. It is impossible to ascertain the proportion obstructed by a chimney of the best quality, because the burner cannot be used without a chimney of some description, but an approximate estimate can be obtained by reference to the experiments of Hartley and Storer previously mentioned. Chimneys made of glass rods have the advantage of causing better diffusion of the light than plain glass chimneys, but this is counterbalanced by their greater liability to break and the greater difficulty experienced in cleaning them.

Mica chimneys are extensively used for incandescent burners, and have the advantage of being practically unbreakable, but they obstruct a considerable proportion of the light. Chimneys made of mica of inferior quality are liable to become ragged and unsightly and to obstruct fully 25 per cent. of the light from the mantle or flame, but a chimney of good quality will remain in good condition for an indefinite period, and should not obstruct more than 15 per cent. of the light.

Reflectors.—The object of reflectors is to obstruct the passage of light thrown in those directions in which it is not required, and to send it into the field to be illuminated. Mirrors and polished metals are excellent reflectors but bad diffusers of light, and are not agreeable for indoor illumination, although most valuable when the light has to be concentrated into one strong beam, as in searchlights.

Reflectors made of opal or thin porcelain have a much more pleasing effect for indoor use, and may increase the light thrown in any particular direction by fully 60 per cent. The angles of inclination of the sides of reflectors were at one time very frequently made too acute, a portion of the light from one side of the reflector being thrown upon the opposite side, instead of upon the object to be illuminated, but the advantage gained by inclining the sides at more obtuse angles is now generally recognised.

The most agreeable form of light is that obtained entirely from diffused reflected light, both the sources of light and the reflectors being entirely concealed from sight. This method of lighting is extravagant, but where the ceiling is white and the walls are covered with paint or paper of a light tint the cost need not be prohibitive.

Guards for Naked Flames.—In many cases where naked flames are in use the risk of fire may be materially reduced by the employment of wire guards (fig. 36). When the flames are

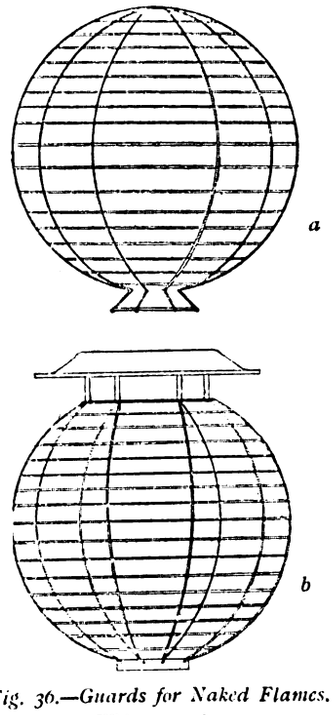

Fig. 36.—Guards for Naked Flames.

a. Without top-plate.
b. With top-plate.

less than 3 ft. from the ceiling the wire guards should be provided with covers of sheet metal.

QUEENSLAND FOREST TREES.

THE following information in regard to Queensland forest trees is forwarded to us from the office of the *North Queensland Herald*, and we give it on the authority of that journal, as it may be of interest to some of our readers :—

Amongst the hardwoods, where strength and durability are required, those known as Ironbark take first rank. Of these there are severa kinds, the best being obtained from *Eucalyptus siderophloia*, of which there are two kinds of wood, one red and the other a brownish-grey, both excellent timbers, though the red is the favourite ; *E. crebra*, or the Narrow-leaved Ironbark, which has a greyish wood, very strong and durable ; and the Palmer River Ironbark, better known by the lemon-like fragrance of its leaves, from which it received its local name, than as a timber. The wood of this last, though very hard and of a rich red colour, is usually small and pipy. The trees known as Stringybarks supply excellent timber for sawing and splitting ; the kinds cut under this name are usually *Eucalyptus acmenioides* and *E. eugenioides*. Nearly resembling these in bark are the trees sometimes called Turpentine (*E. microcorys*), a very hard, strong, durable timber ; *E. Baileyana* and *E. resinifera*, two excellent timbers with a fibrous bark, from which circumstance they are at times known as Stringybarks.

The timber generally known as Gum is furnished by those Eucalypts which annually shed their barks,

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as the Blue Gum (*E. tereticornis*), the Poplar Gum (*E. platyphylla*), the Grey Gum (*E. saligna*), the Spotted Gum (*E. maculata*), the Woollybutt (*E. botryoides*), and the Moreton Bay Ash (*E. tessellaris*). The bark of the last two is persistent at the base. There are also several others called Gum-trees, but those noticed furnish the best timber. The so-called Box is a name under which several trees supplying good, useful timber are known, as Poplar Box (*E. populifolia*), Gum-topped Box (*E. hemiphoia*), Thozet's Box (*E. Raveretiana*), and also the Brisbane Box (*Tristania conferta*).

Two trees are designated Bloodwood. The Common Bloodwood (*E. corymbosa*) is only adapted for using whole, as it often contains cavities in the wood so full of gum as to render it useless for sawing; it is, however, the favourite timber, on account of its durable nature, for house-stumps, piles for bridges, and other works where it can be used uncut. The White Bloodwood (*E. trachyphloia*) is very similar, but the wood is of a lighter colour, and not quite so durable.

The hardwood of the Johnstone River is furnished by a species of *Backhousia*, *B. Bancroftii*. This is a very tall, erect tree, and so far as is yet known, the wood is both durable and strong, does not crack or warp, and is easy to work. The Broad-leaved or Paper-barked Tea-tree (*Melaleuca leucadendron*) the Mahogany—Tom Russell's Mahogany as it is sometimes called—(*Lysicarpus ternifolius*), and the Swamp Mahoganies (*Eucalyptus robusta* and *Tristania suaveolens*) are timbers of a high quality, though the last-mentioned is useless except under water, when it is extremely durable.

The hardest wood, however, of Australia is that of *Erythrophlœum Labouchcrii*, a tree met with in North Queensland, from the Endeavour River to Normanton. The wood of this tree is a rich red in colour, and takes a high polish.

The softwoods in use are the Bunya (*Araucaria Bidwilli*); Moreton Bay or Hoop Pine (*Araucaria Cunninghamii*); Dundathu Pine (*Agathis-Dammara-robusta*); the She-pine (*Podocarpus elata*); and several of the *Callitris* under the name of Cypress Pine.

For cabinet and ornamental purposes the following are in high request:—Red Cedar (*Cedrela Toona*)—the Moulmein Cedar of the English market; Yellow-wood (*Flindersia Oxleyana*), and others of this genus, especially *F. australis*; Silky Oak (*Grevillea robusta*); Deep Yellow-wood (*Rhus rhodanthema*); Tulip-wood (*Harpullia pendula*); and Beech (*Gmelina Leichhardtii*), a tree attaining a great size. The wood of this last is in great request for verandah flooring and deck planking.

Other woods suitable for cabinet work are:—*Elæocarpus Bancroftii*, a tree with a firm, light sapwood and a quantity of very hard, prettily-marked heartwood, though perhaps its true value will be in its proving a substitute for the American *Lignum vitæ* in the manufacture of blocks, pulleys, &c., than as a cabinet wood; several of the *Evodias*, all having a white, pliable wood; the Satinwood (*Zanthoxylum brachyacanthum*), one of the most beautiful Yellow-woods known; *Geijera Muelleri*, a common tree in most Queensland scrubs, having a large quantity of beautifully-marked dark heart; *Siphonodon australe*, another scrub tree whose wood is nearly white, very much resembling ivory when polished; the Bean-tree (*Castanospermum australe*), growing a heart-wood somewhat resembling Walnut, but apt to warp in seasoning; the Queensland Ebony (*Bauhinia Hookeri*), a rich-coloured hardwood, very suitable for veneering; the Scrub Sandalwood (*Exocarpus latifolius*); the Australian Olive (*Olea paniculata*); and many species of *Acacias* commonly called Myalls or Wattles, and remarkable for their rose-like fragrance.

Handsome woods are produced by the "Deadfinish" (*Albizzia basaltica*), *A. canescens*, *Archidendron Vaillantii*, several of the genera *Terminalia*, *Mabu*, *Grevillea*, *Hakea*, *Xylomelum*, *Stenocarpus*, and *Banksia*, the timber of the last five being known as Beefwood; the Silky Oak; the Gulf-country Guttapercha (*Excœcaria parvifolia*) is very prettily marked and conspicuous for its beauty; and the Thready-barked Oak (*Casuarina inophloia*).

GENERAL BUILDING NEWS.

Additions to Training College, Lincoln.—The additions to this college were recently opened. The old buildings have been considerably improved, and a new dining hall, a new classroom, four governesses' rooms, and forty-six dormitories have been erected, accommodation now being provided for 104 students (83 resident and 21 day) compared with fifty-six a short time ago. The work has been carried out by Messrs. Wright & Son from designs of Mr. H. H. Dunn, architect, of Lincoln.

Hospital, Western Bank, Sheffield.—The rebuilding of the administrative block and out-patients' department of the Children's Hospital, Western Bank, has been commenced. The new building will be considerably larger than the houses which have been removed, and will face Western Bank and Clarkson-street. It will be of three stories. Entering from Clarkson-street, there will be a waiting-hall, 34 ft. by 23 ft., two surgeons' rooms, two examination-rooms, a dental room, a small operating theatre, and other rooms belonging to the out-patients' department. A room is provided for at once isolating infectious cases that may present themselves in the waiting-room. The house surgeon will have his rooms on the ground floor, where will also be the matron's sitting-room, nurses' rooms, kitchens, &c., and the first floor will be occupied by the bedrooms of the nursing staff and servants. The work of building is expected to be finished in about twelve months, and the cost is estimated at 9,000*l.* The architects are Messrs. J. D. Webster and J. D. Webster, jun., of St. James-street, Sheffield.

Methodist School Building, Keighley.—Memorial-stones of this school were recently laid on the site adjoining West-lane chapel. The new building is for the greater part of one story. The central hall, 53 ft. by 32 ft., will accommodate 300 persons, and a gallery at one end will seat another 100. Ranged round the central hall are eleven classrooms, and there are an infants' room, 25 ft. by 16 ft., and a lecture-room, 40 ft. by 20 ft. There is also a library, 19 ft. by 11 ft., between the two front entrances, and a kitchen, 16 ft. by 13 ft., on the ground floor at the back. At one side the building will be run up to another level to provide two additional class-rooms, each measuring 20 ft. by 12 ft. 6 in. Externally the appearance of the edifice will be plain, in keeping with the chapel on the right. The cost of the building, excluding the site, but including the furnishing, will be about 2,500*l.* Messrs. Moore & Crabtree, of Keighley, are the architects, and the contractors are as follow:—Mason's work, Mr. Michael Sunderland; joiner's work, Mr. S. Foster; slater's work, Mr. W. Thornton, Bingley; plumber's work, Mr. Wm. Bottomley; plasterer's work, Mr. John Greenwood, Crosshills; painter's work, Mr. Frank Petty; heating apparatus (hot water on the high-pressure system), Mr. R. Rundle, Idle.

Parish Church, Hove, Brighton.—The new parish church at Hove was opened by the Archdeacon of Lewes on the 28th ult. It has been built of Sussex sandstone, and with stone from the quarries of Sir Weetman Pearson, M.P. The seating accommodation is for about 1,300, the building being 160 ft. long and nearly 80 ft. broad. The nave, including the transept, is 108 ft. long and 35 ft. wide, and is divided into six bays. The two western bays, opening respectively into the baptistry and the base of the tower, are marked by lofty and richly-moulded arches springing from clustered piers attached to the north and south walls. The next four bays open into the north and south aisles, and are each 16 ft. wide. The arcades consist of clustered piers, 17 ft. high, from which spring lofty pointed arches. Above these is the clearstory. The architect was the late Mr. Pearson.

School Buildings, St. Anthony's, Newcastle-on-Tyne.—On the 27th ult. the foundation-stone of a new infants' school was laid at St. Anthony's, Newcastle. The site is near the church, and the building will comprise a schoolroom, 73 ft. long and 55 ft. wide, with a folding screen and classrooms. It has other accessories, such as a cooking-room, &c. There will be a large playground about 100 yards in extent. Some 200 children will be accommodated. The architect is Mr. James Wightman Douglas, of Alnwick, and the builder Mr. W. S. Anderson, of Hunter's-road, Newcastle.

Chapel and School, High Wycombe. — The foundation-stone of this school was laid, on the 25th ult. The site of the new buildings is at the junction of Oakridge and Jubilee roads, with direct and near access from the main road to Oxford. The plans show that the schoolroom will be after the Late Gothic style of architecture. The building is to be of red brickwork with stone dressings, and the schoolroom will be 53 ft. 6 in. by 28 ft., accommodation being provided for 250 persons. There is also to be a classroom, 21 ft. by 13 ft.; and lobby and cloakroom facilities will be arranged, together with a scullery at the rear. The contract for the erection of the schoolroom is estimated at 1,377*l.* 8s., which includes the cost of erecting the boundary walls round the site. The architect is Mr. T. Thurlow, of High Wycombe, and Mr. J. T. Harris, of the same town, is the contractor.

Additions to Mansion, near Pitlochry, N.B.—Extensive alterations and improvements are being made to the mansion house at Dunfallandy, near Pitlochry, for Mr. D. Stewart Fergusson. The contractors are:—Mason, Mr. Charles Robertson, Pitlochry; joiner, Mr. A. B. Kennedy, Pitlochry; plumber, Mr. Buchanan, Dunkeld; plasterer, Mr. John Veitch, Pitlochry; slaters, Messrs. Campbell & Storrier, Pitlochry. Mr. A. G. Laskie, of Glasgow, is the architect.

New Buildings, Ascot Racecourse.—Work in connexion with the new buildings on Ascot racecourse has been commenced. The *Windsor Chronicle* remarks that the Royal stand will be situated between those of the Jockey Club and the Master of the Horse and the Lord Chamberlain, its position being similar to that which the old building occupied. The erection will be 70 ft. in length and 40 ft. high. Panelled balconies projecting from the front will overlook the course, and the verandahs above are to be covered with copper. The lawn will be reached by two curved staircases leading down from the principal tier, and sheltered by a canopy, also roofed with copper. The brick wall at the rear will be somewhat in the Queen Anne style, and will be provided with an ornamented iron portico, where the Royal or other visitors will alight from or enter their carriages. The Jockey Club stand will be placed next the Subscribers' private stand, which latter, as well as the clock-tower and grand stand, remain as they were. It is to be 56 ft. 9 in. in length and 54 ft. high, and will have a light iron roof for an awning and verandahs facing the Heath. Dressing-rooms and other apartments will be provided in the building, and there will be separate entrances for members and visitors. The third stand, which will be reserved for the Master of the Horse, the Lord Chamberlain, and others, is the largest of the group. It will be erected on the west of the Royal stand, and here Major Clements and the clerks will have offices. Staircases will lead to the Press stand, and accommodation will be provided for owners and jockeys. There will be several luncheon-rooms and lifts. The buildings, which will be constructed chiefly of iron and wood, will not be in line with the grand stand, as hitherto, but will be brought forward to an angle, so that the occupants might get a better view of the races as the horses come up to the judges' box. This will necessitate the course being altered, and instead of running in a straight direction to the Grand Hotel, it will be brought to a gentle curve. An effort will also be made to reduce the uphill gradient by the winning-post. In order to get the work completed by next June a staff of 500 or 600 men will be employed, and a large number have already been engaged. The men will work night and day, and to enable this to be done the electric light will be installed. The architect is Mr. C. W. Stevens, and the contractors are Messrs. Allen & Sons, of Kilburn.

St. Martin's Church, Roath.—This new church has recently been opened by the Bishop of Llandaff. It is of red brick, with stone dressings. The designs were by Mr. F. R. Kempson, of Cardiff. He was required to find accommodation for 1,000 persons; the site, which is short and broad, made this a difficult matter. It has been done by means of a broad nave and chancel under one continuous roof, with a wide aisle at the south side; on the north side is a narrow nave aisle and a slightly wider chancel aisle, which forms a side chapel. The chancel is raised above the nave, and will eventually be divided from it by a three-arch stone rood-screen.

Rectory, St. Mary Magdalene's Church, Dundee. — The new rectory, church halls, and gymnasium erected in connexion with the church of St. Mary Magdalene, Dundee, were opened on the 29th ult. The rectory occupies the front of the building facing Well-road. It is four stories in height, with large public rooms, the upper floors being occupied by the studies of the clergy, bedrooms, &c. The large hall is entered by two spacious staircases from Well-road, leading to a vestibule which extends the whole width of the building. From the staircases two flights of stone stairs lead to the galleries. The entrances are all fireproof. The hall is 72 ft. long by 50 ft. wide, with a platform at the west end 19 ft. broad, and is capable of seating 1,300 persons. The roof is of partially open timber. Galleries run round the four sides, but it is intended at a future date to place an organ in the west gallery above the platform. On the west wall is placed a large shield bearing the arms of the diocese with mitre on the top. The columns supporting the galleries are relieved with small shields bearing heraldic devices illustrating the different sees of the dioceses of Scotland. The walls are also decorated at suitable points with oil paintings, as is likewise the vestibule, but owing to the spacious character of the walls there is ample room for more pictures than are yet available. A separate stair leads to the platform at the north-west corner of the hall, and is continued up to the galleries. At the south-west corner an outside stone stair, affording means of egress from the gallery, has been built for emergency purposes. There are thus four separate means of public exit from the hall. Lavatories and retiring-rooms for both sexes are provided both at the platform and at the main entrance. Underneath the large hall is a lesser one, capable of seating about 300 persons, and which will prove of great utility for small meetings. A special feature of the building is the gymnasium. This is 50 ft. long by 18 ft. wide, and 17 ft. in height. Entrance to the gymnasium is gained at the north side of the building. In common with the halls and rectory, it is lined throughout with pine, lit by electricity, heated by the low-pressure hot-water system, and ventilated by what is known as the natural system of ventilation. The total cost of the buildings, including the purchase of the site, has been about 3,000*l.* The designer was the late Rev. Edward Sugden, who was for some time Rector of the Church at Coupar Angus. His designs have been carried out in the office of Mr. Robert Blackadder, of Dundee, under the supervision of Mr. David Allan. All the contractors were local firms, namely:—Masons, James Powrie & Son; joiners, D. P. How & Son; plasterer, A. M'Ritchie; painters, Pirie & Croom; slater, Laburn & Son; ironwork, Beath & Keay; plumber, David Brown; electric lighting, heating, grates, &c., G. H. Nicoll & Co. Mr. Robert Low was clerk of works.

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SANITARY AND ENGINEERING NEWS.

BARROW-IN-FURNESS WATER SUPPLY. — The Barrow Corporation Water Bill has now received the Royal assent. The scheme is one for taking a supply from the river Duddon at a point about four miles above Duddon Bridge. The area of the watershed above the proposed intake is about 12,000 acres, and is situated on the lower silurian formation. It is very mountainous, the altitudes ranging from 250 ft. to 2,625 ft. above the level of the sea. The average rainfall is 90 in. per annum. The scheme includes the raising of the level of Seathwaite Tarn by the construction of a masonry dam, so as to enable the Corporation to keep in reserve a quantity of water equal to 450 million gallons for giving compensation to the river in times of drought. The pipe line from the intake works to Barrow will be 17½ miles in length. The water is of fine quality, and is suitable for domestic consumption and trade purposes. The Borough Engineer, Mr. W. H. Fox, is the engineer for the scheme.

WATER-TOWER, WIVENHOE.—On the 24th ult. the foundation-stone of this water-tower was laid. The general water scheme comprises a bore-hole, which has been made in chalk to a depth of 130 ft. It yields 9,000 gallons per hour, and the water has been pronounced by Dr. Thresh, the county analyst, to be excellent. The boring is situated in the lower level of the town, near Queen-street, and the water is to be pumped direct to the water-tower in course of erection on the higher part of the town at the Cross. The tower, 55 ft. high, will be surmounted by a tank with a capacity of 50,000 gallons. Service mains are to be laid all over the district. A bore-hole was first tried near the water-tower, but the water proved to be too saline for domestic purposes. The total cost of the scheme will be 6,500*l.* The contractor is Mr. H. Shardilow, and Messrs. Sands & Walker, of Nottingham, are the engineers.

WATERWORKS, WISHAW, N.B.—On the 19th ult. the new waterworks, which have been constructed for the burgh at a cost of upwards of 100,000*l*, were formally opened at Peden, in the parish of Crawford. The water, which is of excellent quality, is drawn from three burns—the Potrail, Potrenick, and Peden—rising in the Lowthers, on the borders of Dumfriesshire, and pipes have been laid capable of delivering 2,220,000 gallons per diem. Mr. W. R. Copland, of Glasgow, was the engineer.

ELECTRIC LIGHTING, LONGTON.—The electric lighting station erected by the Longton Corporation was opened on the 25th ult. The site is included in the gasworks premises, and the cost of putting down the plant, &c., has amounted to about 21,000*l.* The generating plant, which has been installed by the Electric Construction Company, Wolverhampton, consists of two E. C. C. Bellis generators of a normal capacity of 145 kilowatts each, with provision for a third in the existing station. The steam required for the works is provided by two boilers of 1,000 horse-power. The accumulators are of the chloride type. The normal discharge rate of the battery is 40 kilowatts for a ten-hour period, but in case of emergency the battery could be discharged at the rate of 200 kilowatts for one hour. The works have been designed and carried out by Mr. W. Langford, the Corporation gas manager and electrical engineer.

STAINED GLASS AND DECORATION.

WINDOWS, BRECHIN CATHEDRAL.—Several valuable stained-glass windows have recently been presented to the restoration committee of Brechin Cathedral, and they are described as follows in the *Dundee Advertiser*. In the restored chancel fourteen stained-glass windows have been put in, five on each side and four in the big east window. The subjects on the north side of the chancel represent the five principal scenes in our Lord's life before the commencement of His public ministry. Those on the south side depict the five principal scenes of that ministry. In the north division of the east window there is a figure of Christ as Prophet, in the centre division the figure of Christ as Priest, and in the south division the figure of Christ as King. The first window on the south side of the chancel represents the Nativity—in the top the angels appearing to the shepherds, in the centre the manger at Bethlehem, and at the foot the three wise men coming to worship. The subject of the second window on the same side is the flight into Egypt—at the top an angel appearing to warn Joseph and Mary, in the centre the massacre of the Innocents, and at the foot Joseph and Mary with Jesus on their way to Egypt. In the next window is depicted at the top the presentation of our Lord as a babe at the Temple, in the centre our Lord amongst the doctors, at the foot our Lord in the carpenter's shop. The subject of the next window is the Baptism—in the top there is a representation of John the Baptist baptising our Lord, in the centre a figure of Christ alone, and underneath the figure of John the Baptist pointing him out to some of his disciples, and saying, "Behold the Lamb of God that taketh away the sin of the world." The Temptation forms the subject of the next window—in the top our Lord is seen in the wilderness amongst wild beasts, in the centre He is on the top of a high mountain looking down upon the three great kingdoms of the then known world—Babylon, Rome, and Egypt—and at the bottom Christ with the angels ministering to Him. In the first window on the north side of the chancel there is a picture of the Transfiguration, and underneath the demoniac boy being healed. The second window on that side deals with the scene in Gethsemane—on the top Christ is seen praying with the angel ministering to Him, in the centre the three disciples asleep, and at the foot Judas kissing Him. The Crucifixion—a figure of Christ upon the cross, with His mother and the Magdalen—is the subject of the next window. The succeeding one deals with the Resurrection—at the top an angel at the empty tomb, in the centre Christ and Mary in the garden, and at the foot Christ with His disciples at Emmaus. The Ascension is the subject of the next window—in the upper part a figure of our Lord ascending, in the lower part the figure of an angel saying to the disciples, "This same Jesus shall come in like manner as ye have seen him go." The rose window at the east end bears "Agnus Dei." These windows are all the gift of an anonymous donor. They have been executed by Mr. Henry Holiday, of London, while the scheme was prepared by the Rev. A. D. Tait Hutcheson, of the Cathedral. In addition to these, two fine stained-glass windows have also been presented to the church. One at the east end of the north aisle represents Isaiah and John the Baptist. The other window, which has been placed at the east end of the south aisle, portrays the figures of St. Peter and St. John. These windows were executed by Messrs. Stephen Adam & Sons, Glasgow, after a design by Mr. William Gauld, of Glasgow.

WINDOW, ST. PETER'S CHURCH, SHEFFIELD.—On the 29th ult. a window erected in the baptistry at St. Peter's Church, Abbeydale, Sheffield, in memory of the late Mr. William Turner, was unveiled. It is by Messrs. Jones & Willis, of Birmingham, from the designs of Mr. Joseph Norton, architect, of Birmingham. The subjects dealt with in the three lights are Christ blessing the children, the Presentation of the infant Saviour in the Temple, and the youthful Samuel. Below is a suitable inscription.

FOREIGN.

FRANCE.—M. Denys Puech, the sculptor, has, by the aid of photographs only, modelled a fine bust of the Czar, which is to be sent as a gift to the Empress of Russia from the French President.—The jury in the competition opened for a new church at Domfront, has awarded the first premium to M. Jardel, of Suresnes; the second to MM. Berger & Maistrasse, of Paris; and the third to M. Pignard.—Sixty-seven architects have competed for the rebuilding of the Church of St. Germain, at Flers-de-l'Orne. The first premium has been awarded to M. Forget; the second to MM. Berger & Maistrasse; the third to M. Bréasson. The estimated cost of the work is 700,000 fr.

MISCELLANEOUS.

ROMAN REMAINS IN HAYLING ISLAND, HANTS.—With Roman settlements in Hampshire, Sussex, and the Isle of Wight, it is not strange that tradition should have come down to us of the existence of Roman remains in Hayling Island, and fixed the site at a spot which the excavations of Mr. Talfourd Ely have shown to be correct. In the north part of the island, a little to the west of North Hayling Church, is the Towncil Field, part of a larger area at one time held in allotments, and here from time to time coins have been turned up by the plough. In this field there was a slight elevation, manifestly artificial, and, when examined carefully, it was easy to trace, by the different colour of the crops, the outline of the foundations below, just as at Silchester, the *insulæ*, or blocks, may be detected by the same criterion of a less fertile yield over the stonework. In 1897 Mr. Talfourd Ely commenced operations, which have been carried on year by year since that time. Though he has been rewarded by no very valuable "finds" in the way of curiosities or museum specimens, he has had the good fortune to establish the fact that here stood a very early Roman building of large size, the foundations of the outer walls being, in round figures, 150 ft. by 170 ft. As the work progressed, it became evident that here was more than a villa in the sense of a country residence. The outer walls seem to have enclosed not only the house but outbuildings, such as sheds or barns. The living-rooms were indicated by the presence of painted wall plaster, roof tiles, and light and dark *tesseræ*, though nothing was found that could in any way compare with the fine pavements unearthed at Brading, Silchester, and many other places. This is probably due to the early date of the work, which is approximately fixed at the end of the first century of our era. A bronze coin of Domitian was found during the work. Later coins have also been met with, but early coins seem proportionately commoner here than in most villas. Year by year the excavations have gone on and thrown more light on the character of the building, which will no doubt be described fully by Mr. Talfourd Ely when the work is finished. Last year a chamber was uncovered, the floor of which was of small flints covered with trampled clay, set with *tesseræ* so thickly that more than eighty were picked out from the space of a square yard. The building must have been warmed by hypocausts, for remains of the furnace and flue-tiles were found. A fine specimen of Romano-British work in the shape of a circular bronze brooch was discovered. The groundwork is blue enamel, still brilliant, with a central raised circle, surrounded by smaller ones, each with a depressed setting for a stone. This year a corridor 30 ft. long, another about 40 ft., and a room 15 ft. by 20 ft. were uncovered, so that it is safe to conclude that the house itself was of considerable size. An interesting discovery consisted of a number of fragments of terra-cotta, with deep fittings. Mr. Ely believes that the pieces are to be accounted for by the building having been burned down. The terra-cotta probably served as a dado, or wall lining, as many of the pieces have a projection at the back, apparently for fastening to the wall. The other remains include nails, a Roman key, a razor blade or knife, black Romano-British pottery, and a few pieces of red Samian ware. No human remains were met with; the bones belonged chiefly to domestic animals, and there was more than the usual quantity of boars' tusks, some of large size.—*Standard*.

BRITISH FIRE PREVENTION COMMITTEE. — A silver portrait medal accorded by her Majesty, the German Empress, in connexion with the Berlin Fire Congress of June last, has been presented to the executive of the British Fire Prevention Committee, as a mark of appreciation for the services rendered by that body in the demonstration of scientific and economic aspects of fire protection. It will be remembered that a deputation of the committee comprising Mr. Edwin O. Sachs (chairman), Mr. Ellis Marsland, Mr. F. R. Farrow, and Mr. C. E. Goad, accompanied by the secretary and engineer, visited Berlin in the summer, and that an important exhibit of technical models and photographs was lent to the German Authorities for the exhibition held in connexion with the congress.

ALTERATIONS, ST. GILES' CHURCH, CRIPPLEGATE.—Upon the union of the benefice of St. Bartholomew, Moor-lane, with that of St. Giles, Cripplegate, it was decided to remove to the latter edifice a number of historic appointments which formed an interesting feature of the first-named church. Though itself a comparatively modern edifice, St. Bartholomew's, Moor-lane, contained not a few valuable relics which were recovered from the church of St. Bartholomew-by-the-Exchange at the time of the Great Fire. The original church was rebuilt near the Bank in 1438, destroyed by the historic conflagration, and replaced by Wren. Then, the historian informs us, "the materials of the old church were sold by auction in 1841 for 483*l.* 15s., the south wall and a chapel being reserved to be built into the Sun Fire Office, as was also some of the carved masonry, the old pulpit, the organ, and other woodwork, which were preserved in a copy of the old tower and church erected in 1849-50 by Professor C. R. Cockerell, R.A., in Moor-lane." When it was decided that the Moor-lane edifice should at last disappear for ever, the authorities of Cripplegate obtained a faculty authorising the removal of the several interesting relics to St. Giles'. For some months past the work of re-erection has been in progress by Messrs. W. H. Lascelles & Co., of Bunhill-row, under the direction of Mr. F. W. Jackson, the clerk of works, and now it is nearly complete. The result of the improvement has been to provide an ante-chapel at St. Giles', to the north of the chancel. Here the reredos from Moor-lane has been placed. It is composed of carved wood, attributed to Gibbons, and contains two coloured panels representing Moses and Aaron. The communion-table is of elegantly-figured marble. On the wall, to the north of the reredos, has been fixed another specimen of carving, in which are apertures for two panels. The reading-desk has also been removed. The tiled floor of this former chancel has been relaid, and the partition rails have been made from the choir stalls in use at St. Bartholomew's. The removal has been carefully carried out, and the result is to add in no small degree to the beauty of Cripplegate's parish church. When "the four shoppes" disappear, the Great Fire commemoration window is also to be fitted up at St. Giles'. Apropos of the improvements, it is interesting to note that the same firm have had in hand the re-erection of a house adjoining the church. In order to establish a sound foundation it was necessary to burrow some 27 ft. below the chancel of St. Giles'. This necessitated the temporary removal of a large number of coffins, and, judging from the spot at which the remains of Milton are believed to rest, it is not improbable that the body of the poet was among those thus disturbed. It is significant that the whole of the coffins bore inscriptions, with one exception, and that in this instance the body was enclosed in two shells. The remains have since been restored to their original positions.—*City Press*.

STREET STATUES, HULL.—The *Yorkshire Post* states that at a special meeting of the Hull Corporation City Improvement Committee, held at the Town Hall on the 25th ult., the Mayor approached the members as to their willingness to take another statue out of the Town Hall for the purpose of decorating the new streets. Already the statue of

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William de la Pole, the first Mayor of the town, has been placed at the junction of Jameson-street and King Edward-street. Now, the Mayor suggests that another stone should adorn the open space at the junction of Jameson-street and Savile-street, and he mentioned that of Andrew Marvell, a marble effigy sculptured by Mr. Keyworth, and presented to the Corporation in 1867. The Committee were unanimous that the suggestion should be carried out.

A New Gardening Paper.—*Garden Life* is the title of a new paper of which the first issue has been sent to us, and which is described in its heading as "a practical journal for amateur gardeners." Judging from the contents of the first issue, it seems likely to be of use to those for whom it is intended. "My Suburban Garden: How it has been made Beautiful," is an article the title and subject of which appeal to many who have a small garden and wish to make the most of it.

LEGAL.

BUILDING HOUSES—A CURIOUS CASE.

At the City of London Court on the 25th ult., before Mr. G. Pitt-Lewis, K.C., Deputy Judge, the assignee of Mr. William Purkis, timber merchant, sued Messrs. Nicholson & Son, 105, Cheapside, for 68*l.* 7s. for timber supplied. Mr. Abinger, plaintiff's counsel, said that the defendants had been building sixteen houses in Brook-road, Walthamstow, and the timber sued for was used. The defendants entered first of all into a contract with one Palmont, sen., who was unable to carry out the contract. In the month of January they entered into a contract with Palmont's son, He had no capital, and an agreement was entered into by which they undertook to pay him the sum of 1,600*l.* for the completion of the houses. As the young man had neither capital nor plant it was obvious that he could not carry out the agreement without being financed. Palmont, jun., was paid weekly wages for carrying out the work as the foreman bricklayer for the defendants. The plaintiff's case was that the timber now sued for was ordered by Palmont, jun., on the authority of the defendants. Other goods had been supplied to the houses, and had been paid for by the defendants, who now, however, refused to pay the timber bill. All the prices of the timber and other goods ordered for the buildings were submitted for the approval of the defendants before the orders were given. That showed that the agreement, which had been prepared in solemn form, was really bogus. Evidence was given by the plaintiff and Palmont of the goods having been supplied and used. Palmont, jun., said that nobody had paid for the goods. The defendant's case was that Palmont, jun., agreed to finish the houses for 1,600*l.* The orders for the timber now sued for were given by Palmont, and not by the defendants. There was no truth in Palmont's story that he had been paid weekly wages, and that he was acting as the servant of the defendants. He had received 1,800*l.* in all for carrying out the contract. It was true that the defendants had guaranteed some of the orders which Palmont gave, but in all those cases they had paid the accounts themselves. No such guarantee was given in the plaintiff's case, and no liability was resting upon the defendants. The Deputy Judge delivered judgment at great length, and said that the case was one of considerable importance, not only because of the amount in dispute, but because of the principles involved. The defendants' contention was that the work performed by Palmont had been done under a contract, and that, as that was the case, the timber must be paid for by him. The Deputy Judge said he could not hold that there was a contract at all. It was true that an agreement had been prepared in solemn form, and that it was sent to Palmont for approval by the solicitors, who were the brothers to the defendants. He did not think that Palmont had the ability to understand the matter at all. In his view, Palmont was not an independent contractor, and the relationship between the defendants and him was that of master and servant. That being the case, judgment must be entered for the plaintiff for the amount claimed.—*City Press.*

ALLEGED INTERFERENCE WITH A PARTY WALL.

The case of Sadler *v.* Fairclough came before the Lord Chief Justice of England, sitting as Vacation Judge, on the 2nd inst., on a motion by the plaintiff for an interim injunction to restrain the defendant from interfering with a party wall.

Upon the case being called on, counsel for the plaintiff in support of the motion asked that the case might stand over for a fortnight, as there was a prospect of the parties being able to come to terms.

His Lordship: You had better take three weeks.

The learned counsel stated that nobody now appeared for the defendant, but he had given an undertaking that if the case stood over for a fortnight he would not, in the meantime, further interfere with the party-wall in question.

His Lordship: Very well. I will agree to the case standing over then.

BUILDING DISPUTE SETTLED.

The case of Goldsworth *v.* Masters & Richards came before the Lord Chief Justice of England, sitting as a Vacation Judge, on the 2nd inst., on a motion by the plaintiff for an interim injunction to restrain the defendants from building until the trial so as to interfere with the plaintiff's ancient lights.

Mr. P. Chitty said that the defendants were willing to treat the motion as the trial of the action, and submit to a perpetual injunction.

Order accordingly.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

9,989.—A Fire-proofing Composition: *Huelsberg & Co.*—A composition for rendering wood, fabrics, paper and other substances fireproof consists of the double salts of ammonia and magnesia, or ammonia, and iron, zinc, and so on. It is heated to a temperature of about 70 deg. C. before it is pumped into the impregnating vessel within which it is to be maintained at 98 deg. C. For wooden articles, boracic acid is added to the mixture.

10,015.—Ventilating and Cognate Appliances: *T. Walton and J. H. Walton.*—The air in weaving-sheds is humidified with steam from untainted water with an apparatus that causes steam circulating through pipes to heat water in a cylinder; the steam is drawn away from domes that it may mingle with the air which is forced through pipes, and is then conveyed to the spaces under treatment. For purposes of ventilation the steam supply should be cut off. An injector which supplies the feed-water from a tank is started or stopped by the descent or ascent of a float that acts upon a valve arranged in the steam-supply pipe.

10,039.—An Enamel for Fictile Ware: *G. Appiani.*—An enamel, which is free from tin, consists of an admixture of calcined sand, about 19 parts; minium or litharge, 18 parts; kaolin, 28 parts; common salt, 4 parts; soda, potash, or other alkalies, 3 parts; and quartz or calcined marble, 28 parts.

10,114.—A Circular Saw Guard: *J. E. K. Long.*—By this invention the wood which is to be sawn works the saw-guard automatically. The top of the saw is covered with two semicircular plates affixed to a slide which will be raised with a cord from the end of a lever against which the wood is forced forwards, the guide of the slide being pivoted to a radial bar adjusted about the pillar; a spring lifts the lever, so as to draw the sliding bolt backwards, as soon as the rear end of the wood has passed beyond the end of a lever pivoted beneath the bench, whereupon a curved guard will ascend and cover the saw behind the wood. The guard may upon occasion be worked by hand.

10,168.—Chimney-tops and their Fittings: *E. Milburn.*—For a chimney-top is devised a slotted drum, set vertically, around which are hung louvres upon bights that project from a wire frame, which is disposed around the drum beneath the cover which carries the vanes; a middle bearing upon brackets carries the spindle that reaches up to the top of the up-take; the pointed end of the spindle rests upon a step in an oil-bath, and the spindle is further supported with a series of loose wide rings, each of which consists of a pair of discs having a vulcanite disc between them, the rings being also kept apart from one another with loose tube sections.

10,180.—Blocks for Building Purposes: *J. C. Sellars.*—Hollow blocks for walls and floors are fashioned with interlocking ribs and recesses, and with other recesses that will take horizontal T-iron bars to be tied and clamped together; for stiffening purposes tubes or battens are passed vertically through the blocks; for quoins and buttress or bonding blocks, recesses fashioned transversely in the ribs will take the similar edges of the blocks next adjoining. The blocks consist of cement or lime mixed with ground refuse-destructor clinker, and will serve for tiles when they have been cut across lengthwise. Numerous forms and adaptations of the blocks are specified.

10,191.—A Junction Piece for Gas Pipes and Burners: *T. Boerlage.*—A capsule and tube having indiarubber attachments constitute a connexion-piece that can be fitted on to a split-burner by drawing the rubber over the burner; in the case of a Bunsen burner a rubber ring is used for closing the air-holes when the indiarubber piece has been adjusted in its position.

10,218.—Moulding of Bricks, Pipes, Tiles, &c.: *H. Coiffier, E. Vieville, and A. Majeste.*—Concaved, flanged, and eccentrical screw-blades, that are bolted in pairs on to plates secured to hubs of a squared shaft, press the clay from the mixing cylinder through a grating and a die-plate or mouthpiece, stones, nails, and other hard substances being pressed into boxes provided with doors. The shocks produced by those extraneous substances are reduced by means of knives or arms upon the cylinder and the shaft which will receive a small vertical motion. A fixed arm prevents the blades from carrying the clay around, and one of the arms carries a scraper or rake which is pressed against the cylinder. In order to impart a slight rocking movement to the steel screw-blades, each of them is bolted on to a plate with two bolts, whereof one is inserted through a slot and the other through a round hole in the blade. For hollowed goods, a cross-bar in the die-box carries a support on to which a core or mandrel is bolted; as it is expelled from the die the plastic body is held up with an arm upon the front of the core, whilst a travelling band, divided into lengths, takes the column as it emerges from the die.

10,244.—Ventilating Apparatus: *J. H. Robinson.*—The inventor seeks to minimise the disadvantages attaching to cast air-grate ventilators wherein the moulding and casting limit the extent to which the inclined cross-bars will overlap one another. He fashions the cross-bars separately from the frame and then sets them in their places; in one form of the contrivance he affixes them on to extended cheeks upon the frame; in another he disposes the cross-bars upon the cheeks and secures them with a rod which has projections that will bear upon the bars and is fastened with a nut.

10,254.—A Lifting-jack: *J. C. Crellin.*—The forked end and the other end of a girder are, in each instance, sustained by means of a cross-head worked upon a screw in standards, the load to be moved rests upon one or more of the girders; spur-wheels, a shaft, a worm-wheel, and a worm upon a hand-driven cross-shaft, communicate motion to the main middle shaft. It is arranged that the worm upon the cross-shaft can be disengaged, whereby one may apply a crank directly to the upper end of the shaft and so lower the cross-head rapidly.

10,266.—A Water-Supply Tap: *J. Shanks and R. Burnside.*—The tap is intended for use as a flushing-valve for water-closets, a ball-and-float valve, and a measuring valve for tanks and cisterns. It comprises a valve which slides within a chamber that is joined to the inlet with a passage, and to which a conical facing is affixed. Upon the valve is a seat for a disc-valve mounted upon the spindle; pressure upon the top of the valve keeps it shut under normal conditions, but when one forces the spindle upwards water will escape through, the disc-valve being opened, thereupon the valve is raised by means of a shoulder upon the spindle, a plug-valve serves to control the amount of water supplied to the chamber; a float-lever may be used for the working of the spindle, and the valve can be utilised for supplying measured quantities of water to a cistern, or for flushing purposes.

10,275.—An Apparatus for Kilns: *G. Horn.*—Cold air is admitted into kilns after the annular kind through a main pipe and branch pipes having regulating-flaps, a cone-pulley driving the ventilator.

10,297.—Means of Preserving Wooden Paving-blocks, Sleepers, &c.: *A. Bevier.*—After the blocks have been subjected to a temperature of 212 deg. in closed receivers during from one to five hours, the temperature is increased to from 250 deg. to 500 deg., and an air pressure varying from 100 lbs. to 200 lbs. per square inch is exerted; then is employed a preservative mixture (heated to 300 deg. at a highest pressure of 400 lbs. per square inch) of creosote, oil, resin, and formaldehyde. As the blocks are suffered to become cool under a lessening pressure they are treated with resinate of lime and turpentine. The invention comprises apparatus for the processes specified, including a furnace for melting the resin, tanks, pumps, air-compressors, &c.

10,340.—Floating Baths: *J. C. Dodd.*—The structure comprises a frame built with girders and having air-tight removable tanks beneath, a platform above which is a promenade-deck, and an adjustable bottom, composed of planks interspaced, which can be lifted and lowered.

10,361-3.—Appliances for Electrical Lamps: *J. A. Halford.*—Two conductors formed of fine copper wire wrapped in an asbestos braiding and a penetrable asbestos or cotton material, constitute the cable. A shoulder or bead, against which the fingers may be pressed as one puts the lamp into its holder, is fashioned upon the cap of the lamp, and the sharp edge of the cap enters the support and thereby prevents the accidental flow of water to the connecting-spikes. Pieces for connecting lamps to ceiling-strips have pins or arms that make contact with the conductors, and may either be rigid and be turned round in recesses to bear against the contacts, or be laid in grooves in a strip, the lamps having spring arms that bear against the conductors. Confer also No. 18,414 of 1899 for the special lamps cited.

10,370.—Manufacture of White Lead: *F. J. Corbett.*—Finely-divided lead or lead oxide is dissolved within an air-tight receiver by the application of acidulated aldehyde, alcohol, or alcohol and water. The carbonate or white lead is precipitated under pressure and agitation by the introduction of liquid carbonic acid or carbonic acid gas.

10,383.—An Appliance for Sketchers' Use: *H. Trier.*—The lower portion of the sketching-box has a hinged lid, a hole for the brushes, and a thumbhole, whilst its upper surface (together with a sliding lid) serves for a palette; thin wooden panels are secured with pivoted clips in grooves cut in the lid.

10,384.—A Potter's Lathe: *A. Richard and G. de Franceschi.*—The lathe is devised for making a bowl having a figured polygonal rim, a smooth polygonal body, and a rounded base. The base is

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shapened with a profile tool mounted upon a horizontal axis on to which the main jolley lever is pivoted. The profile tool for the body of the article is mounted upon another lever, which is pivoted to a vertical pin of the jolley lever, and has a vertical rod that engages with the cam-groove of a ring upon the table or wheel. A spring draws the two levers together in a horizontal guiding-fork. On a bent portion of the second lever is loosely mounted a third lever, which is provided with a profile tool which fashions the corrugated or escalloped rim and is pressed by a flat spring attached to the second lever. Round, elliptical, and polygonal articles may be made by using two, three, or more levers and suitable profile tools.

10,400.—METHOD OF MOULDING BRICKS: *H. Alexander.*—The plastic material is pressed forwards from the bottom of the pan into an ordinary cylinder machine by a pug mill, the opening in the mixing-pan being regulated with slides having slotted bolt holes, whilst all surplus clay in the mill will rise through ports in the mouthpiece and casing and drop over the edge into the mixing-pan.

MEETINGS.

THURSDAY, FRIDAY, and SATURDAY, OCTOBER 3, 4, and 5.

Royal Institute of British Architects. — Visit to Glasgow and Annual Dinner. The programme as at present arranged is as follows:—Thursday, October 3 Annual Dinner. Friday, October 4: (1) Lunch in the Exhibition grounds, given by the Glasgow Institute to the Royal Institute visitors. (2) Visit to the Glasgow University (tea). (3) Conversazione given in honour of the Royal Institute by the Corporation of Glasgow. Saturday, October 5: Visits to Exhibition, &c.

FRIDAY, OCTOBER 4.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wright Clarke on "Details of Plumbers' Work. 7 p.m.

SATURDAY, OCTOBER 5.

British Institute of Certified Carpenters.—Monthly meeting. Mr. W. T. Sweett on "Modern Joinery." 6 p.m.

Northern Architectural Association.—Visit to Newcastle Breweries Premises and Electric Power Station, Newcastle.

Sanitary Institute.—Inspection and Demonstration at Sewage and Destructor Works, Ealing. 2.15 p.m.

MONDAY, OCTOBER 7.

Society of Engineers.—"Preliminary Investigations for Water Supply," by Mr. Sydney M. Hollis; "Irrigation Works in South Africa," by Mr. J. Freebairn Slow. 7.30 p.m.

Liverpool Architectural Society.—President's opening address. 6 p.m.

TUESDAY, OCTOBER 8.

Architectural Association of Ireland.—Annual General Meeting, 20, Lincoln-place, Dublin. 7.45 p.m.

FRIDAY, OCTOBER 11.

Architectural Association.—Annual meeting: President's Address and delivery of prizes. 7.30 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 18.—By WOODS & SNELLING (at Eltham).

Eltham, Kent.—44 to 58 (even), High-st., f., r. 218*l.* £3,695

By WORSFOLD & HAYWARD (at Sandwich).

Barnsole, Kent.—A freehold farm, 170 a. 0 r. 30 p. 830
A freehold cottage and 0 a. 2 r. 2 p. 250
Market garden land, 4 a. 2 r. 25 p., f. 280
Preston, Kent.—Perry Farm, 22 a. 1 r. 37 p., f. .. 800
West Marsh, Kent.—House, cottage, and fruit plantation, 3 a. 3 r. 4 p., f. 470
Two freehold cottages and 4 a. 1 r. 29 p. 195

September 19.—By WM. WESTON (at Uxbridge).

Hillingdon Heath, Middlesex.—Uxbridge-rd., South Lodge and 1 a., e.r. 75*l.* 1,100

By PAYNE, TRAPPS, & Co. (at Stratford).

Whitstable, Kent.—Seeshill-rd., 11 plots of building land, f. 107
Southend-on-Sea, Essex.—7, Sea View-rd., f. 450

September 20.—By HUSSEY & SON (at Exeter).

Black Torrington, &c., Devon. — Butterbeare Farm, 287 a. 2 r. 34 p., f. 2,500
House, shop, and 1 a. 3 r. 22 p., f. 520
Hill Moor, &c., enclosures, 175 a. 3 r. 22 p., f. 1,355
Highweek Farm, 199 a. 2 r. 22 p., f. 4,155
Lana and Forda Farm, 409 a. 2 r. 31 p., f. 3,200
King's Moor, &c., meadows, 107 a. 2 r. 31 p., f. 650
East Gradd n Farm, 395 a. 1 r. 7 p., f. 1,620
Moiety of Northcote Farm, 147 a. 1 r. 25 p., f. 505
Chilla Farm, 219 a. 3 r. 7 p., f. 1,430
Flares Farm, 118 a. 0 r. 29 p., f. 1,100
Nine freehold cottages and a site 496
Manor of Black Torrington, with high and chief rents 152

By H. F. RUSSELL & SON (at Leominster).

Pembridge, &c., Hereford. — Lower Barewood Farm, 103 a. 2 r. 14 p., f. 3,000
The Barewood Farm, 15 a. 3 r. 27 p., f. 720
Two freehold cottages and 2 a. 0 r. 13 p. 265
Blacksmith's shop and 0 a. 3 r. 24 p., f. 125
Newtown, Hereford.—Two residences and 14 a. 2 r. 8 p., f. 1,460
Monkland, Hereford.—Two freehold cottages and gardens 115

September 21.—By W. J. VILLAR & Co. (at Taunton).

Otterford, Somerset.—The Wydecombe Estate, 142 a. 1 r. 25 p., f. 3,500

By PEIRCE & THORPE (at Northampton).

Murcott, Northants.—A freehold farm, 35 a. 0 r. 33 p. £1,700
Long Buckby, Northants.—Surney Meadows, 16 a. 1 r. 18 p., f. 720

September 24.—By DAVID BURNETT & Co.

Bromley, Kent.—Blyth-rd., Summerland, f. 1,595
Southend, Essex.—69 and 71, London-rd., f., r. 72*l.* 1,040

By CHETWYND, LLOYD, & DEANE.

Finsbury Park.—301, Green-lanes, u.t. 40½ yrs., g.r. 12*l.* 12s., e.r. 75*l.* 620

By FLOOD & SONS.

Edmonton.—Bury-st., The Brook House Building Estate, area 12 a.; also 1 to 16, Bury-st. and f.g.r. 22*l.* 10s., reversion in 98 yrs. 7,600
Croydon.—153 and 155, St. James's-rd., f., r. 75*l.* 1,110
Norwood.—Beulah Spa-ter., f.g.r. 40*l.*, reversion in 99 yrs. 970

By FREEHOLD LAND AND TRADING COMPANY.

Twickenham.—8, Whitton Park-ter., f., e.r. 35*l.* 540

By FREDK. WARMAN.

Holloway.—21 and 23, Sussex-rd., u.t. 51 yrs., g.r. 10*l.* 10s., r. 70*l.* 695
13, Alexander-rd., u.t. 56¼ yrs., g.r. 6*l.*, r. 36*l.* 350
Highgate.—66, Langdon-rd., u.t. 96 yrs., g.r. 8*l.* 400
Gray's Inn-rd.—9, Calthorpe-st., u.t. 18 yrs., g.r. 10*l.*, e.r. 75*l.* 400
11, Wells-st., r. 55*l.*; also i.g.r. 5*l.*, u.t. 41 yrs., g.r. 10*l.* 345
Clerkenwell.—36, Amwell-st., u.t. 11 yrs., g.r. 7*l.*, e.r. 55*l.* 265
Carshalton, Surrey.—39, Mill-lane, f., r. 26*l.* 350
Canonbury.—4 and 6, Grange-rd., u.t. 35 yrs., g.r. 13*l.*, e.r. 130*l.* 1,060
Finsbury Park.—16 and 36, Wilberforce-rd., u.t. 65 yrs., g.r. 16*l.*, r. 96*l.* 1,005
Manor Park.—72, 74, and 76, Second-avenue, u.t. 90½ yrs., g.r. 15*l.*, e.r. 75*l.* 650

By R. DONKIN & SON (at Newcastle).

Mitford, Northumberland.—The Edington Estate, 647 a., f. 21,020

By J. KITTOW (at Launceston).

Otterham, Cornwall.—The Otterham Manor Estate, 900 a., f. 5,000

September 24 and 25.—By WALTER LUDLOW & BRISCOE (at Wolverhampton).

Wolverhampton, Staffs.—The Lloyd House Estate, area about 796 a., f. (in numerous lots) .. 54,802

September 25.—By FULLER, HORSEY, SONS, & CASSELL.

Llanidloes, Montgomery.—The Van Lead Mines, 207 a. 3 r. 3 p., u.t. 12 yrs., subject to certain royalties and rentals; also a residence and 18 cottages, u.t. 35 and 33 yrs., g.r. 14*l.* (the whole as a going concern) 3,000

By BAXTER, PAYNE, & LEPPER.

Lambeth.—172, 174, and 176, Vauxhall-st., c., r. 81*l.* 18s. 650

By DYER, SON, & HILTON.

Blackheath.—57, Kidbrook Park-rd., u.t. 63½ yrs., g.r. 10*l.*, e.r. 70*l.* 600
Lee.—Stone Yard-place, i.g.r. 12*l.* 12s., u.t. 63 yrs., g.r. 1*l.* 2s. 235

By DOUGLAS YOUNG & Co.

Wimbledon.—Pelham-rd., Dale House, f., e.r. 75*l.* 1,000
Clapham. — Rodenhurst-rd., Woodlands Lodge, area ¾ of an acre, f. 790

By JOSEPH STOWER (at Chesham).

Chesham, Bucks.—Codmore Farm, 102 a. 0 r. 29 p., f. and c. 4,000

By COOPER & HILL (at Hannington).

Romsley, Worcester.—Romsley House Farm and The Halt, 123 a. 1 r. 10 p., f. 2,550

September 26.—By Messrs. CRONK.

Sevenoaks, Kent.—Vine Court-rd., a plot of building land, area ¾ of an acre, f. 700

By J. G. DEAN & Co.

Wandsworth.—7, Althorpe-rd., f., e.r. 45*l.* 550
3, Bolingbroke-grove, u.t. 80 yrs., g.r. 15*l.*, e.r. 80*l.* 795

By REYNOLDS & EASON.

Anerley.—40, 42, and 44, Anerley-vale, u.t. 50 yrs., g.r. 4*l.*, r. 59*l.* 375
City of London.—6, Cheapside, corner building site, let on building lease for eighty years at per annum 530

By LINNETT & LANE.

Ealing.—2, Darwin-rd. and three plots of land adjoining, f. 500

By C. C. & T. MOORE.

Forest Gate.—113, Earlham-grove, f., e.r. 70*l.* .. 1,000
Clapton.—114, Brooke-rd., u.t. 76 yrs., g.r. 8*l.*, e.r. 60*l.* 750
Manor Park.—119, White Post-lane, u.t. 70½ yrs., g.r. 4*l.* 10s., e.r. 40*l.* 285
Mile End.—14, St. Ann's-rd., f. 355
Haggerston.—14, Nicoll-st., f. 410
Bethnal Green.—3 and 4, Derby-pl., u.t. 52½ yrs., g.r. 4*l.* 490

September 26.—By STIMSON & SONS.

Putney.—4, 6, 12 to 36 (even), Danemere-st., u.t. 97 yrs., g.r. 78*l.* 15s. 3,650
Leytonstone.—46, 48 and 50, Harrow-rd., f., r. 88*l.* 1,405
Bow.—81, 83 and 85, Antill-rd., u.t. 67 yrs., g.r. 13*l.* 10s., r. 90*l.* 1,000
2, 4, 6 and 8, Balmer-rd., u.t. 72 yrs., g.r. 16*l.* 920
Brixton.—49, Holland-rd., u.t. 21 yrs., g.r. 7*l.* 7s., e.r. 42*l.* 210
Camberwell.—12, Boyson-rd., u.t. 51 yrs., g.r. 3*l.*, e.r. 40*l.* 410

By CURTIS & SHARP (at Stratford).

Upton Manor.—16, 18 and 20, Lawrence-rd., f. .. 1,190
Canning Town.—Victoria Dock-rd., a corner block of building land, f. 450

September 27.—By J. C. PLATT.

Lampton, Middlesex.—Lampton-rd., The Elms residential building estate, 25 acres, f. 9,700
Hove, Sussex.—59, Godstone Villas, f., e.r. 45*l.* .. 550

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 11 0	"	" "
Facing Stocks	2 12 0	"	" "
Shippers	2 8 0	"	" "
Flettons	1 8 6	"	at railway depôt.
Red Wire Cuts	1 14 6	"	" "
Best Fareham Red	3 11 0	"	" "
Best Red pressed Ruabon Facing.	5 5 0	"	" "
Best Blue Pressed Staffordshire	4 4 6	"	" "
Do., Bullnose	4 9 0	"	" "
Best Stourbridge Fire Bricks	4 2 6	"	" "
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	"	" "
Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats	17 0 0	"	" "
Double Stretchers	19 0 0	"	" "
Double Headers	16 0 0	"	" "
One Side and two Ends	19 0 0	"	" "
Two Sides and one End	20 0 0	"	" "
Splays, Chamfered, Squints	20 0 0	"	" "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats	14 0 0	"	" "
Double Stretchers	15 0 0	"	" "
Double Headers	14 0 0	"	" "
One Side and two Ends	15 0 0	"	" "
Two Sides and one End	15 0 0	"	" "
Splays, Chamfered, Squints	14 0 0	"	" "
Seconds Quality White and Dipped Salt Glazed	2 0 0	"	less than best.

	s. d.		
Thames and Pit Sand	7 3	per yard, delivered.	
Thames Ballast	6 0	"	"
Best Portland Cement	34 6	per ton, delivered.	
Best Ground Blue Lias Lime	25 6	"	"

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.	
Bath "	1 7	"	"
Farleigh Down Bath	1 8	"	"
Beer in blocks	1 6½	"	"
Grinshill "	1 10	"	"
Brown Portland in blocks	2 2	"	"
Darley Dale in blocks	2 1½	"	"
Red Corsehill "	2 5	"	"
Red Mansfield "	2 4½	"	"
Hard York in blocks	2 10	"	"
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt	
" " 6 in. Rubbed Ditto	3 0	"	"
" " 3 in. sawn both sides slabs (random sizes)	1 3	"	"
" " 2 in. self-faced Ditto	0 9½	"	"
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt	
" " " 6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.	
" " " 3-in. do.	1 2½	"	"

SLATES.

in. in.	£ s. d.		
20 × 10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.	
" best seconds	" 10 15 0	"	"
16 × 8 best	" 6 2 6	"	"
20 × 10 best blue Portmadoc	10 18 0	"	"
16 × 8 best blue Portmadoc	6 0 0	"	"
20 × 10 best Eureka unfading green	11 2 6	"	"
16 × 8 " "	6 15 0	"	"
20 × 10 Permanent green	10 0 0	"	"
16 × 8 " "	5 12 6	"	"

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt	
Hip and valley tiles	3 7	per doz.	
Best Broseley tiles	48 6	per 1,000	" "
Hip and valley tiles	4 0	per doz.	" "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	" "
Do. ornamental Do.	60 0	"	" "
Hip tiles	4 0	per doz.	" "
Valley tiles	3 9	"	" "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	" "
Hip tiles	4 1	per doz.	" "
Valley tiles	3 8	"	" "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0

[*See also page 303.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Isolation Hospital	Bexhill U.D.C.	25*l*	Nov. 23

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Schools, Oxford-street (Contract No. 1)	Bridlington School Board	J. Barnshaw, Architect, Bridlington	Oct. 8
Heating, &c., Schools	do.	do.	do.
Public Baths, &c., Duke-street Park	Sheffield Corporation	C. F. Wike, Civil Engineer, Town Hall, Sheffield	do.
*Roadmaking and Paving Works	Willesden District Council	O. Claude Robson, Dyne-road, Kilburn, N.W.	do.
Additions to Workhouse Infirmary, &c.	Stone (Staffs) Guardians	J. J. Chapman, Architect, Stone	do.
Seven Houses, Melbourne-road, Carlisle		J. Beaty, Old Post Office Court, Carlisle	do.
Police Court, Abertillery, Mon.	Standing Joint Committee	W. Tanner, County Surveyor, Abertillery	do.
Heating Work, Central Schools	Bridlington (U.D.) School Board	J. Earnshaw, Architect, Bridlington	do.
*Reconstruction of Combined Drainage	Metropolitan Borough of Fulham	Medical Officer of Health, Town Hall, Fulham	do.
*Making-up Streets	Enfield U.D.C.	Surveyor to Council, Court House, Enfield	Oct. 9
Kiln, Chimney, &c., Summer-lane, Barnsley		G. H. Gray, 6, Royal-street, Barnsley	do.
Villa, Deramore Drive, Belfast		Blackwood & Jury, Architects, 41, Donegall-place, Belfast	do.
Road Works, Clyde-street, &c., Old Hill	Rowley Regis U.D.C.	D. Wright, Old Hill, Staffs	do.
School, Rowland's Gill	Winlaton School Board	Liddle & Brown, Architects, Mosley-street, Newcastle-on-Tyne	Oct. 10
Sewers, Regent-road	Salford Corporation	Borough Engineer, Town Hall, Salford	do.
Stabling, Stone Trough Brewery, Halifax	Messrs. T. Ramsden & Son, Ltd.	W. H. D. Horsfall, Architect, Tower Chambers, Halifax	do.
Electric Lighting, Halfway-street, Sidcup	Greenwich Guardians	T. Dinwiddy, Architect, 12, Crooms-hill, Greenwich	do.
Forty Shops, Ipswich		Eade & Johns, Architects, Cornhill Chambers, Ipswich	do.
Five Cottages, Margam, Wales	Miss E. C. Talbot	G. Lipscomb, Estate Office, Margam Park, Port Talbot	do.
Concrete Work at Electricity Station	Dundee Gas Commissioners	W. Alexander, Architect, Dundee	do.
Additions to Workhouse, Orclid, Cheshire	Congleton Guardians	A. Price, Architect, Elworth	do.
Water Supply Works, Welburn	Malton (Yorks) R.D.C.	E. Richardson, Civil Engineer, Town Hall, Malton	Oct. 11
Drainage Works, &c., Welburn	do.	do.	do.
*Limestone Tar Paving	Broadstairs & St. Peter's U.D.C.	Town Surveyor, Council Offices, Broadstairs	Oct. 12
Water Supply Works	Aspatria (Cumberland) T.C.	Pickering & Crompton, C.E., 11, Lowther-street, Whitehaven	do.
Borehole, East Donyland	Lexden & Winstree R.D.C.	Sands & Walker, Architects, Angel-row, Nottingham	do.
Sewerage Works, Dovenby	Cockermouth R.D.C.	J. B. Wilson, Civil Engineer, Cockermouth	do.
Widening Road, Grange Village	do.	do.	do.
*Erection of School	Farningham School Board	G. H. Tait, Architect, Dartford, Kent	do.
Waterworks, Aspatria, Cumberland		Pickering & Crompton, C.E., 11, Lowther-street, Whitehaven	do.
Additions to Infirmary	Berkhampstead Guardians	C. H. Rew, Architect, Berkhampstead	do.
*Firemen's Cottages, &c.	Beckenham U.D.C.	J. A. Angell, Surveyor, Beckenham	Oct. 14
Additions to Schools, Hanover-street, Batley		C. H. Marriott, Son, & Shaw, Architects, Dewsbury	do.
Additions to Hospital, Taunton	Taunton & Somerset Hosp. Comte.	J. H. Spencer, Architect, 5, Hammel-street, Taunton	do.
*Making-up Roads	Beckenham U.D.C.	John A. Angell, Surveyor, Beckenham	do.
Sewers, Old Hollington-lane	Hastings Corporation	P. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
Steel Rails (2,200 tons)	Great Northern Ry. Co. (Ireland)	T. Morrison, Amiens-street Terminus, Dublin	do.
Cement, Pipes, &c.	Belfast Harbour Commissioners	G. F. L. Giles, Engineer, Harbour Offices, Belfast	do.
*Builders' Work for New Baths	Bristol Corporation	W. S. Skinner, Architect, 16, Baldwin-street, Bristol	Oct. 15
Motor Cars	Leeds Corporation	T. Hewson, Civil Engineer, Municipal Buildings, Leeds	do.
Additions to Workhouse, Renfrew-road	Lambeth Guardians	S. E. J. Smith, Architect, 14, York-buildings, Adelphi	do.
Water Supply Works	Buckfastleigh (Devon) U.D.C.	T. W. Stainthorpe, Civil Engineer, Totnes, Devon	do.
Laying Cast-iron Pipes (4½ miles), Todmorden	Rochdale Corporation	J. Mansergh, Engineer, 5, Victoria-street, S.W.	do.
Gas Works, Upton, Lea	Slough Gas Co.	T. Webb, Engineer, Gas Works, Slough	do.
*Roadmaking Works	Hornsey U.D.C.	Engineer to Council, Southwood-lane, Highgate	do.
*Parochial Hall, Trinity Church, Finchley-road	The Church Committee	J. B. Lofting, 37, Old Queen-street, Westminster	do.
Baths, Maze-street, Barton Hill	Bristol Corporation	W. S. Skinner, Architect, 16, Baldwin-street, Bristol	do.
Chapel at Asylum, Sligo	Asylum Committee	Sir T. N. Deane & Son, Architects, 15, Ely-place, Dublin	do.
*Victoria Stone Paving	Tottenham U.D.C.	W. H. Prescott, 712, High-road, Tottenham	do.
School, Chipping Hill	Witham (Essex) School Board	W. P. Perkins, Surveyor, Council Offices, Witham	Oct. 16
*Low-level Sewer	Wimbledon U.D.C.	Engineer, Council Offices, Wimbledon	do.
*Shalfleet Water Supply Works	Isle of Wight R.D.C.	S. E. Tompkins, Engineer, Newport, Isle of Wight	do.
*Newchurch Water Supply Works	do.	Clerk to Council, Pyle-street, Newport, Isle of Wight	do.
Police and Fire Station, Mill-street	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
*Granite Kerb and Setts, Paving Slabs, &c.	Ware U.D.C.	J. E. Smales, Surveyor, New-road, Ware	Oct. 17
*Barging Away and Disposal of Rubbish	Metropolitan Borough of Stepney	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	Oct. 19
*Sub-District Post Office, West Kensington	Commissioners of H.M. Works	H. Tanner, H.M. Office of Works	Oct. 20
*Heating and Ventilating Youghal Lunatic Asylum	Cork District Lunatic Asylum	H. A. Cutler, Municipal Buildings, Cork	Oct. 21
*Artizans' Dwellings, Plaistow	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	Oct. 22
*Additions to Hospital	Willesden District Council	O. Claude Robson, Engineer, Dyne-road, Kilburn	do.
*Additional Wing to Asylum	Cambridgeshire, &c., Asylum	A. P. MacAlister, Architect, 20, St. Andrew's-street, Cambridge	Oct. 24
*Drainage Works	Gosport and Alverstoke U.D.C.	R. St. George Moore, Civil Engineer, 17, Victoria-street, S.W.	Oct. 28
*Furniture for New School	East Ham School Board	R. L. Curtis, 120, London-wall, E.C.	do.
*Workshops and Outbuildings	Hackney Institute	A. W. S. Cross, Architect, 58, Conduit-street, W.	do.
*Town Hall	Cheltenham Corporation	Town Clerk, Municipal Offices, Cheltenham	Oct. 30
*Refuse Destructor Installation	Levenshulme U.D.C.	J. Jepson, Surveyor, Levenshulme	Nov. 2
*Small School, Monmouth	Haberdashers' Co.	H. Stock, Architect, 9, Denman-street, S.E.	No date
*New Arcade, Ipswich		Eade & Johns, Architects, Ipswich	do.
*Kennels for Surrey Union Hunt	Lord Ashcombe	C. Smith & Son, Architects, Reading	do.
Two Houses, Bath-road, Worthing		R. S. Hyde, Architect, Worthing	do.
Drill Hall, Wrexham	The Primitive Methodists	M. J. Gunmow, Architect, Egerton-street, Wrexham	do.
Church, Chorlton-cum-Hardy, near Manchester		Moulds & Perritt, Architects, 77, King-street, Manchester	do.
Sewers (6 miles), Felixstowe		W. Durrant, Rocksdale, Felixstowe	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Temporary Assistants (2), Borough Engineer's Dept.	Borough of Islington	Not stated	Oct. 10
*Inspector for Sewerage	South Stoneham R.D.C.	3*l*. 3s. per week	do.
*Surveyor and Engineer	Bilston U.D.C.	200*l*.	Oct. 19

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxii.*

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PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards—		
1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Dantzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 14 0	0 16 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders ,, ,,	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 17 6	- - -
Pipe in coils	15 7 6	- - -
Soil Pipe	17 17 6	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,, ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 4½	- - -
SOLDER—Plumbers' ,,	0 0 7	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

PLASTER, &c.

	s. d.	
Coarse Plaster	30 6	per ton delivered.
Fine ,,	47 6	,, ,,
Superfine ,,	88 6	,, ,,
Coarse Keenes and Parian cement	55 0	,, ,,
Fine do. do.	75 0	,, ,,
Robinson's Fireproof Cement	50 0	,, ,,
Do. Fine white, finishing (Exclusive of the ordinary charge for sacks.	55 0	,, ,,
Whiting	27 0 to 30 0	,, ,,
Cow hair for plastering	£9 0 0	,, ,,

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d. per ft. delivered.
,, ,, fourths	2¾d. ,, ,,
21 oz. thirds	3¾d. ,, ,,
,, ,, fourths	3¾d. ,, ,,
26 oz. thirds	5d. ,, ,,
,, ,, fourths	4¼d. ,, ,,
32 oz. thirds	6d. ,, ,,
,, ,, fourths	5¼d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, ,, 21 ,,	4¼d. ,, ,,
½ Hartley's Rolled Plate	3d. ,, ,,
⅜ ,, ,, ,,	3¾d. ,, ,,
½ ,, ,, ,,	4d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 10
,, ,, ,, in barrels ,,	0 2 11
,, ,, ,, in drums ,,	0 3 1
Boiled ,, ,, in pipes ,,	0 3 0
,, ,, ,, in barrels ,,	0 3 1
,, ,, ,, in drums ,,	0 3 3
Turpentine, in barrels ,,	0 2 3
,, in drums ,,	0 2 5
Genuine Ground English White Lead per ton	22 0 0
Red Lead, Dry ,,	22 10 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 10 0

VARNISHES, &c.

	per gallon. £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

E. W.—T. S. (Amount should have been stated). J. W. (Below our limit).

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We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BARNSLEY.—Accepted for the erection of a lodge, additions to laundry, &c., Kendray Hospital, for the Town Council. Mr. J. H. Taylor, C.E., Manor House, Barnsley:—

Section 1.

Brickwork.—G. Mellor	£336 0	
Carpentry, &c.—J. Smith	195 0	
Plastering.—Miss Fleming	54 10	
Slating.—Miss Fleming	36 10	
Smith and Foundry work, and Plumbing and Glazing.—J. Snowden	112 0	
		£734 0

Section 2.

Brickwork.—G. Mellor	£1,012 0	
Carpentry, &c.—A. Owram	555 0	
Pastering.—T. Lindley	178 5	
Slating.—Miss Fleming	120 0	
Smith and Foundry work, and Plumbing and Glazing.—B. Dennison	205 9	
		£2,070 14

Section 3.

Brickwork, &c.—G. Mellor	£881 0	
Carpentry, &c.—A. Owram	725 0	
Plastering.—Miss Fleming	177 0	
Slating.—Miss Fleming	194 10	
Smith and Foundry work, and Plumbing and Glazing.—B. Dennison	200 12	
Hotwater Engineering.—J. Snowden	215 0	
		£2,393 2

Section 4.

Brickwork, &c.—G. Mellor	£159 0	
Carpentry, &c.—A. Owram	75 0	
Plastering.—T. Lindley	10 8	
Slating.—Miss Fleming	58 0	
Plumbing and Glazing.—B. Dennison	27 6	
		£309 14

Section 5.

Brickwork.—G. Mellor	325 0
	£5,832 10

[All of Barnsley.]

BARNSLEY.—For the erection of a villa, Park-grove, for the United Methodist Free Church Trustees, Barnsley Circuit. Mr. C. L. McLintock, architect, 28, Church-street, Barnsley. Quantities by architect:—

Building.—J. W. Hampson*	£394 10
Carpentry and Joinery.—Atkinson Bros.*	110 10
Plumbing and Glazing.—J. R. Sharp*	75 0
Plastering.—T. Lindley*	55 15
Slating.—M. E. Fleming*	27 0
Painting.—Beaumont Bros.*	14 0

[All of Barnsley.]

BIRMINGHAM.—For the erection of two cottages, and additional farm buildings, &c., Marston Green, for the Guardians. Messrs. Whitwell & Sons, architects, 23, Temple-row, Birmingham:—

A. Colin Hughes, Stratford-rd., Birmingham* .. £1,495

[Architect's estimate .... £1,650.]

BRIGHTON.—For the erection of thirty artisans' dwellings, Dewe-road, &c., for the Town Council. Mr. F. J. C. May, C.E., Town Hall, Brighton:—

Latten & Evershed	£6,990	Mitchell & Co.	£6,075
Turnbull & Co.	6,577	S. & W. Simmonds, Brighton*	5,950
F. Clarke	6,412	J. A. Mordecai	5,700
Norman, French, & Co.	6,090		

BRISTOL.—For alterations, &c., to Royal Infirmary. Mr. A. P. J. Cotterell, architect, 28, Baldwin-street, Bristol:—

B. H. Howell	£724	Thomas & Son	£596
A. J. Bevan	680	E. T. Hatherley	574
S. R. Gorvett	675	A. Dowling, Montpelier, Bristol*	553
E. Love	629		
L. Browning	600		

FLOOKBURGH (Lancs.).—For rebuilding farm premises, Field Head, for Miss Seatle. Mr. C. P. Chambers, architect, 34, Cornwallis-street, Barrow-in-Furness:—

W. Blair	£521 1 9	R. Hutton, Carkin-Cartmel	£458 7 6

KIRKBY-IN-ASHFIELD.—For the execution of sewerage works, Pinxton-road, Church Hill, and Skegby-road, for the Urban District Council. Mr. W. Dodsley, surveyor, 14, Stockwell-gate, Mansfield:—

J. H. Vickers	£1,968 0 0	John Lane	£1,046 13 3
Lock & Andrews	1,389 13 0	Tomlinson, South Normanton, Alfreton*	967 0 0
Lane Bros.	1,310 19 0		
Hawley & Son	1,284 11 3		

LINCOLN.—For the erection of abattoirs in the Cattle Market, for the Corporation. Mr. R. A. Macbrair, surveyor, Corporation Offices, Lincoln:—

Pattinson & Sons	£6,733 0	Wright & Son	£6,101 0
W. & M. Halkes	6,696 0	Lincoln Co-operative Soc., Silver-street, Lincoln*	6,050 19
H. S. & W. Close	6,680 0		
Halkes Bros.	6,619 0		

[*See also next page.*

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LLANDAFF.—For widening a bridge over River Ely, St. Fagan's, for the Rural District Council. Mr. J. Holden, C.E., 35, St. Mary-street, Cardiff :—

Frank Ashley ..	£493 17 6	Chas. Davies ..	£408 4 4
Thos. Rees	486 17 0	J. Evans, Plas-newydd-place, Cardiff*	314 2 0
W. Cox.....	466 5 0		
C. H. Cooksley	450 0 0		

LLANFAIRFECHAN (Wales).—For the erection of business premises, &c., for Mr. W. Eames. Mr. R. Davies, architect, 125, High-street, Bangor :—

Watkin Jones, Bangor	£1,427 0	Erasmus Jones, Llanfairfechan .	£1,203 12
R. & I. Williams, Bangor.....	1,379 0	Evan Humphreys, Llanfairfechan .	1,200 0

MERTHYR (Wales).—For the erection of a public reading-room, Penydarren, for the Urban District Council. Mr. T. P. Harvey, Surveyor to the Council. Quantities by surveyor :—

W. W. Ingleson ..	£875 0	Enoch Williams, Russell - street, Dowlais*.....	£559 12
J. Ienkins	610 0		
S. H. Williams....	595 0		

TYNEMOUTH.—For alterations to schools, for the School Board. Mr. F. R. N. Haswell, architect, Tyne-street, North Shields :—

J. & W. Simpson, North Shields and Blyth*.. £1,435

Painter's Work.

W. W. Ward, North Shields* £289 13

WALTHAMSTOW.—For additions to schools, for the School Board. Mr. H. Prosser, architect, High-street, Walthamstow :—

Cookery Room.

R. & E. Evans	£798 0 0
Sands, Palmer, & Co.	710 0 0
A. W. Robins, Wanstead‡	680 0 0

Partitions, Gamuel-road Schools.

Sands, Palmer, & Co., Walthamstow‡	£109 7 0
J. J. Dean	124 0 0
A. W. Robins	130 0 0
Barrett & Power	140 0 0
Ridgway & Son	210 0 0

Partitions, Forest-road Schools.

Ridgway & Son	£180 0 0
J. F. Penn.....	123 10 0
Barrett & Power	117 0 0
R. & E. Evans.....	90 10 0
J. & J. Dean.....	78 0 0
Sands, Palmer, & Co.....	76 10 0
A. W. Robins, Wanstead‡	58 0 0

Partition, Pretoria-avenue Schools.

Ridgway & Son	£110 10 0
J. F. Penn.....	63 0 0
Barrett & Power	56 10 0
A. W. Robins	50 0 0
Sands, Palmer, & Co.....	36 7 0
J. & J. Dean‡	28 0 0

Fencing, Wood-street Schools.

Ridgway & Son	£153 0 0
Barrett & Power.....	138 0 0
R. & E. Evans.	129 0 0
Leeder & Davies.....	120 15 6
Sands, Palmer, & Co.	96 0 0
J. F. Penn.....	93 10 0
A. Kind.....	92 10 0
J. Ruggles	82 0 0
A. W. Robins‡.....	80 0 0

‡ Recommended for acceptance.

WEYMOUTH.—For the execution of outfall sewerage works, for the Corporation. Mr W. B. Morgan, Borough Engineer, Municipal Offices, Weymouth :—

G. F. Bowring	£3,996 0 0	J. A. Bartlett, Franchise-st., Weymouth* .	£2,582 10 6
J. T. Whett-ham	3,600 0 0		
Cooke & Co..	3,450 0 0		

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The Builder.

VOL. LXXXI.—No 3,62. OCTOBER 12, 1901.

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New House at Ascot Heath.—Mr. Leonard Stokes, F.R.I.B.A., Architect ..... *Double-Page Photo-Litho.*
The Bar-Gate of Southampton: Scheme for its Preservation.—By Mr. R. M. D Lucas ..... *Double-Page Photo-Litho.*
"Prix de Rome" Designs in Architecture, Painting, and Sculpture ..... *Double-Page Ink-Photo.*

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A Ramble through South-Western France.

PERHAPS the most noticeable difference between the extreme south of France and the centre or north is that a larger number of old public buildings and churches remain in an unrestored state than might be expected at the beginning of the twentieth century. The borders of the Mediterranean are still comparatively pastoral and agricultural; whilst the northern districts, crowded with industries and a manufacturing population, are in every sense changed. In the north and centre of France the ancient churches, buildings which must always represent a desire on the part of a people to perpetuate its own memory in monumental form for future ages, have evidently disappeared to a remarkable extent. In purely rural districts the old parish church still lingers in the centre of each village. As a rule it is a perfectly uninteresting building, its outside walls probably "restored" during the past half century by the government department charged with this business, its interior "decorated" in the coarse and vulgar style of imitated mediævalism for which the school of Viollet-le-Duc is perhaps responsible, and every trace of ancient furniture and decoration completely removed, and replaced with the cheap gaudy trappings associated with the Roman Catholic religion on the Continent.

France has suffered from two very thorough destructions of ancient art and architecture. At the Renaissance and during the period of the religious wars the old churches were probably to a very great extent gutted of all that they possessed of mediæval furniture. But this havoc was more than completed by the atrocities of the various revolutions the country has suffered from during the past hundred years, which have always been animated by the curious desire to destroy everything ancient, or which could suggest a historical past. As a consequence, a strange sense of the unaccountable comes over one on finding as exceptions to a rule a few old tombs and monuments of various ages in out of the way corners of some of these old churches, when everything else has been sacrificed to revolutionary rage. These old monuments are usually of very little interest in themselves—naturally all that bore an important historical character had the least chance of surviving—they merely serve to accentuate the bareness of the old whitewashed interiors, and remind one of what an enormous amount of monumental art has been destroyed. The Government engineers found but little to "restore" during the "Gothic revival" of the past century except the bare walls and vaults of these old churches; all the tombs and altars and other ecclesiastical works of art of the former centuries had practically disappeared, and probably more than half the ecclesiastical buildings of France were in ruins, or being pulled down for other purposes during the early years of the nineteenth century. In the far south of France the natural indolence of the people, perhaps, tended to preserve the old buildings, and they have merely been converted as they stand into stores and workshops. In Avignon, for example, although the horrors of the Great Revolution broke out here with extraordinary violence, the city at first sight appears to be still provided with its ancient public buildings; but the defaced churches, with their broken statues and ornaments, are mostly converted to secular purposes. The curious palace-fortress of the mediæval Popes remains in a singular state of preservation—indeed, it is quite one of the best preserved unrestored buildings in the whole of France. Its simple massive walls, perhaps always devoid of armorial or decorative features, appear not to have excited the animosity of the revolutionists, who merely converted the place into a huge prison for the unfortunate "aristocrats" of the district. Since those days of horror it has served as the local barracks, for which purpose it is likely to remain in use for many years to come. Lately a project has been started to turn it into a provincial museum, but the means are not forthcoming. Two little frescoed chapels in one of the towers, supposed to have been painted by the Florentine Simone Memmi, remain in a wonderful state of preservation, the whitewash having been cleared off without any restoration of the old paintings.

Almost adjoining the palace is the curious little cathedral, a building of Romanesque period, with singular additions of much later times, well preserved and quite unrestored; and in this church are the monuments of two mediæval Popes, that of Benet XIII., still standing in its chantry, and in a remarkably perfect condition, but no doubt considerably patched up during the past century. The other monument, that of John XXII., is merely in fragments, and its original location is not clear; at least, the chantry in which it once stood no longer exists. This latter monument, to judge from the fragments which remain, was most extraordinarily like an ordinary canopied tomb of the English fifteenth century style, with a canopy of three divisions terminating in spires carried over a recumbent figure of the Pope. Traces of very charming coloured decorations of the Italian Cinquecento remain over the western entrance of this church.

Avignon is certainly the loveliest of all the old French cities; it is situated in the most beautiful part of the Republic, and its artistic remains are amongst the most interesting to be found in France. The view from the upper part of the city over the windings of the Rhone towards Villeneuve-les-Avignon is quite unparalleled in its peculiar character and charm, and it has the remarkable interest of looking almost untouched since the Middle Ages. The great château of Villeneuve, with its frowning battlements and round towers, and the mediæval town clustering round it, is seen at such a distance, that any trace of modern building which may exist is invisible. The ruined bridge with its tiny chapel on a pier, so well known from pictures, which once connected Villeneuve and the city of the Popes, gives almost an unreal effect to the exquisite landscape. No sign of modern life appears, no railway or factory chimney comes within view to mar the peculiar beauty of the scene. Even the modern bridge which

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replaces the famous old one happens to have been constructed out of sight.

But, alas! this exquisite old city of so many historical memories is to be devoted ere long to a considerable amount of "progressive" vandalism. It would seem that the ancient walls of the city which still survive in a remarkable manner are to be removed. The *Journal des Débats*, &c, in a recent number draws attention to the threatened destruction in the following words:—"Le Ministre et la Commission des Monuments Historiques ont montré une scandaleuse faiblesse en abandonnant aux caprices de la municipalité un monument, dont du reste ils n'ont pas le droit de disposer."

Should this beautiful old palace-fortress of the mediæval Popes ever be "restored," some of the grandest and largest Gothic vaulted halls in existence will come to light. The great hall of the Consistory, now divided in its height by a wooden floor, is a splendid apartment divided by a row of columns into two aisles of immense length and width, but in its present condition its proportions are quite invisible. Its vaultings are still decorated with paintings of the early Italian school.

Carcassone is a very interesting place for the antiquary to visit. The old city, standing on a height and containing 600 inhabitants, is separated from the comparatively modern town and railway station by a river spanned by a mediæval bridge. Seen from the railway, the old city has almost a theatrical effect, reminding one of some reproduction of "Old Paris," or "old" anywhere else, at an international exhibition; and this impression is not very much lessened by a nearer approach to the ancient site. The walls of various dates surrounding the city, with the château at one corner, remain, at least as far as their plan is concerned, in a remarkable state of preservation. These ancient walls have for some years back been declared a national monument illustrating the mediæval history of France; but the very thorough "restoration" to which all their upper parts have been subjected must rather detract from their actual historical value. As a monumental picture of a mediæval city, due to the munificence of the French Government, Carcassone is a very remarkable place and well worth a visit.

The fortifications of Carcassone are of the crossbow period, and consist of a main curtain with towers of various form crowned by slated roofs (these latter are probably all modern). The base of this curtain is protected by another lower wall, with low round bastions in front of each of the towers of the main curtain. The château of the fifteenth century is an irregular enclosure surrounded by a higher curtain and round towers. It is a system of fortification without a moat, which the site on a hilltop and a southern climate necessitated. Within the tower there are very few ancient houses remaining, and only one church—the former cathedral, a building with a highly picturesque interior on a plan of the usual mediæval Italian type, the hammer-headed or tan cross. The poor commonplace cottage buildings of the town are probably much the same as must have existed in the Middle Ages, and consequently they do not detract from the unity of effect which has been aimed at in the modern restoration. Seen from a distance no modern buildings appear above the city wall.

This singular effort to "restore" a mediæval town is, of course, due to the influence of Viollet-le-Duc and his school. As a monumental illustration of the famous "Dictionnaire," it is of special interest to a student of mediæval antiquities, and the French Government is to be lauded for such a munificent gift to the artistic world as is constituted by this most learned restoration. For it is a distinctly learned, careful, and reverent restoration, and the buildings which form the monument remain unoccupied for any modern use, and so there is a certain interest attaching to the work, although to many visitors that special charm of an unrestored mediæval town, with its evidences of gradual change and development into comparatively modern usage, may be absent.

The least satisfactory detail in the restoration is the very much renewed church. This might surely have been left in such condition as the revolutionists may have determined at the end of the eighteenth century. But the building has been very completely "restored," and even a number of ecclesiastical tombs provided, with the deplorable reproductions of mediæval sculpture which the modern Frenchman considers good enough for a church. As a building this church has a remarkably picturesque interior; the transepts have an eastern aisle provided with shallow chapels, but the furniture is merely the ordinary modern Roman Catholic sort. A pompous inscription records the completion of this work in 1898.

The lower town of Carcassone also appears to be of mediæval foundation, but it has at one time been surrounded by an ordinary earthwork with bastions of the seventeenth century type. Hardly any mediæval buildings remain in this lower town, except two very large churches, probably built by the two great Orders of the Middle Ages. Both these churches are of the same Italian plan with three eastern apses within the width of a very spacious nave, and a great tower at the west end. As is the case with most French churches, the interiors are completely devoid of furniture and monuments older than the beginning of the present century, and such fragments of antiquity as may have escaped the Revolution have been removed by would-be "restorers," who have decorated the unfortunate buildings with poor imitations of Viollet-le-Duc's peculiar mural decorations.

The enormous span of the nave vaults in some of these southern French churches astonishes the northern visitor. These two churches at Carcassone are good examples of the ordinary style (fifteenth century). Many of the comparatively small towns or villages also possess churches of the same type, with naves of over 50 ft. in width. The means of supporting the thrust of these enormous vaults is obtained by building the walls as a series of small chapels on each side of the nave; the side walls of the chapels constitute enormous buttresses capable of carrying almost anything.

Albi is a wonderful old southern city, hard to arrive at and still more difficult to leave conveniently; it lies off the main railway lines, and retains that delightful air of the old "cathedral city" with which we are familiar in England. Its stupendous cathedral is its only monument of importance. A picturesque little palace of the archbishop stands in an adjoining enclosure and, combining with the mediæval surroundings, forms a charming picture of provincial France.

The cathedral of Albi is probably the largest example of the wide single-span vaults peculiar to the south of France. This stupendous construction is supported in the usual way on a series of enormous internal buttresses which form side chapels on each side of the nave. The choir of the church is formed by an enclosing wall of the most elaborate flamboyant stone tracery which entirely surrounds it, allowing of a passage or ambulatory between the choir and the external walls of the church. The interior seems to have been somewhat spared at the Revolution, and the fine large figures of saints, which very much resemble the series in Henry VII.'s chapel, Westminster, still occupy nearly all the niches. Two features about this church are of special interest to a student—its particularly imposing and beautiful proportions, due chiefly to its simplicity of plan and completeness in every respect, and secondly to its very original decorations. These decorations consist of elaborate painting over the entire internal surface of the building in the early Renaissance style, and with the utmost variety of colour and detail. Each division of the great vault is treated differently, and, of course, the small lateral chapels have each a separate design. These decorations, which must have become very decayed at the beginning of the nineteenth century, were restored at that time by local workmen, who painted them over in oil colour, following the original design with few exceptions. The total effect is rich and very interesting.

Marseilles is a grimy, squalid, deplorable-looking city, with hardly a redeeming feature from the architect's point of view. Its modern quarters resemble Paris in their vulgar pretentious architecture of a style which, after a few years of exposure to a smoke-laden asmosphere, assumes a particularly depressing and gloomy effect. The huge masses of ponderous stone carving framing the innumerable windows of a modern French boulevard or street are peculiarly meaningless and uninteresting. The monotonous character, the vulgar display, the want of individuality, and also the want of scale in these buildings, produce as depressing an effect on the mind as some suburban district of London. In the case of Marseilles the unsatisfactory characteristics of the city are heightened by a detestable climate and the consequences of a dirty smoke-laden atmosphere. More even than in Paris the sordid commercial spirit of modern days is manifested by the universal method of constructing the houses with their pretentious carved stone fronts apparently reposing on the plate-glass windows of cafés and shops. Hardly a house in Marseilles possesses a ground-floor which is not a shop. In fact, Marseilles, though it is considered the second place in importance in France, is a very second-rate city. It is as squalid as Naples used to be, but without the beautiful atmosphere of Italy to redeem its ugliness. Its unswept streets, encumbered with the eternal French café chairs and tables and the obtrusive display of low-class stores, give a detestable impression to the visitor anxious to get away from such a disagreeable sort of place.

As in the case of all French cities of modern days, the architecture of the public buildings, as well as the new houses in the

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boulevards, has evidently been "made in Paris." Architecture of such a kind is not sufficiently interesting to call for criticism; every local characteristic is eliminated, and the huge *maisons de rapport* may be better studied in their native Paris, where their peculiar developments are carried out on a more impressive scale.

The only noticeable modern monument of any artistic importance in Marseilles is the Cathedral, a huge building at the side of the port, chiefly built during the reign of Napoleon III., whose name is inscribed within it under the title of "Præses Reipublicæ." It is imposing on account of its size and singular position, almost overhanging the great port and quite detached from the city. It is in that peculiarly uninteresting round arched style so much affected by the modern French church; its details have the appearance of being machine work, and its decorations are painfully unconventional. Completed so lately as 1886, this building looks quite old in consequence of the blackening effect produced by the neighbouring port. It has all the uninteresting character of a great monument completed and finished in every part "by contract." Nothing suggests any private or individual interest in any part of the building. No monuments or private chapels disturb the uniformity of this model Government cathedral. It has been built by Government architects at Government expense; and it remains a gloomy, unsympathetic monument of the State religion of the country.

ON SOME UNFINISHED PICTURES.

"INTERNATIONAL" is a rather large term to apply to an exhibition in which a few foreign artists—mostly not of the highest rank—exhibit along with a number of English ones, many of whom also are not very much known to fame. "International Society of Sculptors, Painters, and Gravers" it is called ("engravers" is evidently a vulgar word); but the internationality seems to be rather in abeyance, for even some of the few foreign works are apparently lent by owners, and not sent directly by the artists. Moreover, this International Society apparently cannot spell the name of the greatest French landscape-painter, for two small landscapes lent by Mr. J. S. Forbes, which seem to be early works by M. Harpignies, appear as by "Harpigny." At all events "Beaulieu" (112) shows exactly M. Harpignies' peculiar method of outlining the stems of trees with a streak of dark colour, and it is odd if there is a painter with a name so similar employing so similar a method.

Nevertheless, the exhibition at the Piccadilly Galleries is of interest, not only because it contains a good many clever and striking pictures, but because it serves to illustrate a certain tendency in modern painting—landscape-painting especially—to regard the subject of the picture not as a matter of interest in itself, but merely as an opportunity for showing the handling of an effect of light, or of mist, or of colour, which is regarded as the end in itself, the development of the nominal subject of the picture being a secondary matter. In some cases this is carried to a perfectly absurd extreme, as in Mr. Studd's "Hampton Court" (27) the object of which is evidently the contrast of colour and line between the masses of trees and the building, but in which the trees are mere formless blotches of pigment, which it is ridiculous to ask us to accept as trees; and there are other examples just as bad. Works of this kind may be very useful to the artist as rapid memoranda of effects made on the spot; but to exhibit them as works of art is playing on the credulity of the spectator. So, again, M. Neven-du-Mont's "Lily—a Portrait" (63), is a good rapid pastel study for a portrait, but much more a work for the studio than for the picture gallery.

There are other things in the exhibition which, as examples of a broad and free treatment of Nature without finish of detail, are of considerable power and interest, and serve to remind one of Muller's remark to Constable as to the finishing of a picture being the spoiling of it. Mr. Priestman's "The Lock" for instance (77), is a fine study of effect of trees and water, and one might very well accept the idea that to carry it further might be to spoil it. But then, in this and other cases, is not the artist really shirking a difficulty, either in regard to executive power or to labour? It is surely a much easier task to produce a broad effect which shall please the eye and mind, and suggest a good deal more than is actually made out, than to carry the picture out to a more complete stage without losing the appearance of breadth and freedom. That is just wherein the highest difficulty lies, and the artist eludes it. The curious feature in connexion with the whole matter is that these painters of unfinished pictures would persuade the public, and have persuaded some of the coterie of art critics, that there is an æsthetic superiority implied in the mere fact of leaving a picture at this stage; that this is the higher art; that an unfinished picture stands *ipso facto* on a higher level than a finished one. It is only on this supposition that one can explain a great deal of really clever work which is to be seen in such an exhibition as this. There is even in the catalogue a long quotation of mystical satire from Mr. Whistler in regard to the abject folly of finishing portraits or figure paintings (for that is what it seems to amount to), dramatically illustrated by his own ghost of a figure of Phryne. Whether the artist himself really believes in such a painting of the nude figure as this, or whether he is merely amusing himself by playing on the credulity of his public, is a conundrum we do not undertake to solve.

Taking this, however, as a collection of for the most part unfinished pictures, there are in it a good many works of power and interest as such; among the landscape studies especially. Mr. Paterson's "Blacknest Tarn" (2) is a good study of the landscape under the light of the rising moon; the moon is cracked on the face and not quite spherical, though evidently meant for a full moon, but the effect of light is there. Mr. Reid-Murray's sketch of "Autumn Landscape" (65) has merit of the same kind—a mere sketch, but true in light and colour; Mr. Priestman's "Uplands" (89) also; his "Bend of the River" (87), on the other hand, is a mere smudge. Landscape composition (if there is still such a thing) is well illustrated in Mr. Grosvenor Thomas's "Evening" (103). There is poetic feeling in Mr. Withers's sketch of "Evening on the Forth" (119); character and interest in Mr. Dekkert's "Low Tide at St. Monan's" (120), with the craft aground in the wind; and Herr Petersen's "Marine" shows a certain individuality in colour and general treatment of the sea, without outstepping the limits of Nature; as much cannot be said of his "Hochsee" (254), which is a mere stage sea under artificial lighting. James Maris's "Amsterdam" (107), lent by Mr. Forbes, is a really fine work, but is only a loan, not an artist's exhibit. Pissarro's "Le Carrousel" on a winter morning (242) is a real piece of Paris winter effect; and there is another admirable winter picture in Herr Buysse's "Wondelgen Church" (273), seen at the end of an avenue with snow on the ground; a kind of modern Hobbema as to composition. An interesting and suggestive picture too is M. de Sidaner's "La Statue" (238), a little *place* in some French country town, seen in warm mellow sunshine, the "statue" in the middle forming a central object with its back to the spectator, so that we may fancy it what we will. Some of the contributors, however, seem to have a special spite against architectural subjects; one of them shows a front of Amiens Cathedral (209) in what is called "water-colour," but may be rather called a scrabble in dirt, and the same may be said of "Vieilles maisons au bord de l'eau" (28), by another foreign contributor—a smudge out of which it is indeed difficult to make anything.

Such a sketch as Mr. Crawhall's "Barnet Fair" (23), a momentary effect, as one may say, of sunlight and horses, forms one of the best apologies for the system of unfinished pictures, representing as it does an effect which was worth record but hardly perhaps worth a picture in the completer sense. So also Mr. David Gauld's "Ayrshire Calves" (55: is there a particular character, by the way, in Ayrshire calves as distinguished from others?) shows an excellent study of animal form and movement, though the texture is left to the imagination. Among figure subjects which come within the prevalent temper and tendency of the exhibition Mr. Chase's life-size of a woman and child, "His First Portrait" (21), cannot however be classed among unfinished pictures; it is painted in a broad style and somewhat dingy in colour, but is a complete and expressive work. Mr. Lavery's beautiful half-length portrait of a lady (48) is complete in every sense, and a picture which seems quite out of place amid its surroundings; in two other works he seems to have relapsed into the prevalent habit of the place and sent large scale portraits which are in a very crude stage of execution. M. Renoir's picture called "The Promenade" (93) is a curious example of the tendency referred to above, to regard a subject not for itself but only as a means of exhibiting the study of a particular effect. The figures are a man and woman representing the most uninteresting and vulgar type of French middle-class life; as far as they are concerned the picture is absolutely ugly and commonplace; but it is painted, and hung, for the sake of the representation of the effect of broken sunlight, through foliage, on the woman's white dress. This is cleverly done, but was it worth while to paint a picture of this kind for the mere sake of the effect? One is curious to know, too, for reasons of another kind, what a life-

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size portrait by Boldini is doing here; a kind of picture and a kind of artist that we should have thought would have been repudiated with both hands by the Committee of an exhibition of the professed aims of this one; a picture which represents the most commonplace *chic* of sleight-of-hand painting. The exhibition can boast of a fine picture by Israels (101); but that is a loan, and not an artist's exhibit

The works in sculpture are only small bronzes for the most part—not numerous nor very important; but M. Troubetzkoy's small group called "Mother and Child" is full of force and character, and we may also draw attention to Mr. Fisher's fine bit of enamel design on copper, "How Beautiful upon the Mountains," &c., classed in the catalogue with the West Gallery exhibits, but really in the Central Gallery. This at any rate is finished, and is a beautiful bit of work of its kind. And among the unfinished pictures there is much to admire, in others besides those we have named. It would be interesting to have an exhibition of them in their finished stage next year.

NOTES.

The late Mr. Brooks.

Mr. James Brooks, whose death is recorded in our obituary column, together with a list of some of his executed works, filled a more important place in modern English architecture than the general public seem quite to recognise, judging from the meagre notices of him which have appeared in the daily papers. Commencing his architectural career at the time when the movement for church building was in full activity, and being employed largely as a church architect, instead of following the line of mere imitation mediæval architecture, he struck out a path of his own, and exactly in a direction in which a new ideal for the modern church was very much needed. He was professedly and by predilection a Gothic church architect; but he treated Gothic in a manner of his own. He perceived that the principle of mediæval architecture could be as well illustrated in brick as in stone, and that it was possible to carry out large churches for the masses at a reasonable cost, not by being content with thin walls and bad carving, but by employing plain materials in a substantial and monumental construction, and depending for effect on composition and mass rather than on ornament. On these lines he succeeded in producing churches, for town sites especially, which were dignified and solid edifices with no suspicion of modern-mediæval gimcrack about them. He obviously gave a great deal of study to the designing of the lines of his buttresses and gables and other features which are sometimes treated in a perfunctory manner; and the evidence of the study was unmistakable in his buildings. Plain as they often were, they were never commonplace, and gave the impression that every line had been carefully considered. His design for Liverpool Cathedral, based on a fine plan, and with a great deal of power and picturesqueness in the architectural treatment, was a remarkable conception, over which also he spent immense care and thought, studying and drawing many parts of it to a larger scale than required in the competition drawings, in order to work it out more thoroughly. He was an architect possessed both of genius and of the faculty of painstaking and conscientious study.

The Glasgow Visit of the R.I.B.A.

The meeting in Glasgow last week of the Royal Institute of British Architects left nothing to be desired except, perhaps, better weather. Although some well known architects were absent, the meeting was representative both of the profession and the Institute, and the heartiness of the welcome of the Institute by the local architects says much for the good understanding existing between the allied societies and the parent body. On the occasion of such a successful exhibition as that which is now being held in Glasgow, the visit was sure to be specially interesting and profitable, but success was assured when the Corporation and the Glasgow Institute were united in the endeavour to give the visitors a hearty welcome. A fitting conclusion of the visit was the brilliant reception by the Corporation in the municipal buildings, when the members had an excellent opportunity of inspecting Mr. Young's building. Altogether, the visit must rank as the most successful of the kind which the Institute has held away from London.

The Liverpool Cathedral Scheme.

A Liverpool architect, Mr. Shallcross, writes an admirable letter in the *Times* attacking the action of the Liverpool Cathedral Committee in regard to what, as he truly says, is a matter of national and not of merely local interest. He directs his criticism especially against the mistake on which we have already commented, of demanding a cathedral "in the Gothic style"; a double mistake, since not only is the idea of demanding a style of the past an absurdity in itself, but the mediæval type of cathedral is not suited either to the requirements or the sentiment of modern worship. In fact, the Cathedral Committee appears to consist of fossil ecclesiologists who are totally unaware of all that has been going on in the modern architectural mind during the last quarter of a century. They make no undertaking, either, to employ professional advice or assistance in judging of the drawings sent in to them. They may be pretty well assured that no architect of the highest class will respond to such an invitation.

The National Trust.

The society which is now becoming well known as "The National Trust"—for places of beauty; &c., being understood (we may suggest, *en passant*, that the society, whose offices are at 1, Great College-street, Westminster, should adopt the popular name if only to propitiate journalists)—highly congratulates itself on the excellent piece of work it has done by obtaining for the public in perpetuity a large tract of land on Derwentwater. No one can move about the United Kingdom without seeing what a wide and useful field there is for the operations of this society. We look forward to work being done by it no less valuable and national than that of the Commons Preservation Society. There are many open spaces and many interesting buildings which will be lost to future generations unless they are taken charge of by this society. Perhaps the most striking example is the Thames, which every year is losing something of its charm by the erection of houses along its banks—the goose being rapidly killed for the sake of the golden egg, since every villa that is built by the side of the river takes away from its beauty. Unquestionably the time has come when this society would be undertaking a national work if it set out to obtain for open space as much land as it can obtain along the banks of the Thames. We believe that were a special fund opened for the purpose it would be widely supported, and there is so much land in the market on the Thames that there would be no difficulty in commencing operations at once. On the architect and the architectural student this society certainly has great claims, since it is likely to hold for posterity many important buildings which, not being as world-famous as English cathedrals, are liable to be lost unless placed in the hands of a society whose object is primarily not to restore but to preserve.

Labour Disputes.

A letter published in the *Times* this week from Mr. Thomas Case, the well-known Oxford tutor, called attention to various interesting points in regard to labour disputes. Mr. Case appears to think that the right of combination has given too great power to working men, but it is now purely academic to complain of this fact, for combination is the most remarkable feature of recent trade movement among all classes. Trusts and co-operative societies are striking examples. When, however, Mr. Case says that workmen "have a legal right, which is less defensible (than the right to combine), to combine to picket in crowds, with a view to information about another's business," he undoubtedly points to a weak spot in the present state of the law. Theoretically, it may be perfectly harmless for several hundred workmen to surround a factory, and inform non-union men of the mistake it is to go on working in that building. Practically this amiable and benevolent object becomes a severe threat, and where one man is getting information a dozen are using threats. And as long as the law stands as it does this must happen, for it is powerless to prevent verbal and also indirect intimidation by the mere presence of masses of hostile men. Workmen should have the fullest right to strike and to combine, but the moment a strike is declared it should be made illegal for workmen on strike to loiter near a building owned by capitalists against whom the strike is directed. Absolute freedom for every one should be the aim of the law, and any form of picketing is a blow at individual freedom.

The Workmen's Compensation Act.

The decisions of county-court judges are, of course, not binding as legal precedents, but, from time to time, they deserve consideration, as in the case of that recently-given at Southwark. The long and short of the case was that the hands of a workman, by continued working at a particular process, became sore and then diseased, and it was contended that he had suffered from "a personal injury by accident." It is clear that the workman was not injured by what is popularly and generally known as an accident, and the Judge so held. But obviously the case raises questions of some importance, since it

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is—as happened to this workman—quite conceivable that a man may be injured just as seriously gradually as suddenly. In such circumstances why is he not to be compensated? It may be said that he enters into the work knowing what risks he runs. But in a sense every workman knows that in most trades he is liable to accidents. One can imagine a painter, for example, being seriously injured in his health. These cases are rare, but that is no reason why they should be left outside the Act, and it would appear desirable that, in cases of injury to health by the use of certain processes, the workman should be entitled to compensation when a real chain of causation between the sickness and the process can be clearly proved.

Architectural Association of Ireland.

THE Annual Report of the Architectural Association of Ireland, together with the prospectus of meetings and classes for the coming session, shows that the Association is in earnest in its endeavour to promote and facilitate architectural study. The Association has still to make its way, and we presume it has not received as yet all the support it may have the right to hope for, but the tone of the Report is encouraging. The Association is offering a studentship of 10*l.* (open to members under thirty) for the best measured drawing of a building in Ireland erected before 1820; a good list of suggested buildings being added. The Institute of Architects of Ireland offers a prize of the same amount to members of the Architectural Association for a design for Public Baths and Wash-houses for a town in Ireland with a population of 20,000; Mr. Doolin offers a prize of four guineas for the best-filled sketch-book; and Mr. W. F. Beckett one of two guineas for the best sketch of the Custom House, Dublin. Classes for architectural history, design, and building construction are to be held twice a week during the session. "Every effort is being put forward to make these classes of real and lasting benefit to the students." Their success must largely depend on the students themselves, and it is to be hoped that they will do their best to take advantage of the opportunities of improvement offered to them.

A.A. Discussion Section.

THE programme of subjects to be considered in the Discussion Section of the Architectural Association during the coming session is a very good one, and appeals to a variety of interests. It includes, among other subjects, "Stables and Stable Fittings," the subject to be started by Mr. H. Gregory Collins; "Design in Furniture," by Mr. Vivian H. King; "The Manufacture, Testing, and Uses of Portland Cement," by Mr. H. Howard Humphreys, the author of the useful and practical communication published in our last issue; "The Work and Influence of Augustus Welby Pugin," by Mr. P. W. Mulready; "Stained Glass," by Mr. Dudley Forsyth; and "The Organ, its Proper Position and Architectural Treatment," by Mr. F. C. Eden. The only question in our mind is whether some of these subjects might not have been still more advantageously considered at the larger general meetings of the Association. The distinction between the two, of course, is that the larger meetings are for the reading of a pretty full paper on a given subject, the discussion being secondary; whereas at the Discussion Section discussion is the main object, and the papers ought to be short, and calculated to make suggestions and start discussion rather than to exhaust the subject. Writers of papers for the Discussion Section will be wise to bear this in mind, and keep their communications brief and comprehensive; otherwise the Discussion Section may lose its proper function and become too much like a repetition of or rival to the general meetings.

Higher Elementary Schools.

THE Board of Education has recently issued "rules as to building" higher elementary schools. By Article 110 (6) of the Code the number of scholars in a school of this kind is limited to about 300. For a school of the maximum size the new rules require ten classrooms, of which at least four must be suitable for classes of forty scholars. A classroom for forty scholars must have an area of about 620 square feet, and one for thirty scholars about 480 square feet. These areas are considerably in excess of the requirements for elementary schools. The desks must be single, 2 ft. long, and arranged in pairs with intervals of 2 in., and gangways of 2 ft. Laboratory accommodation must be provided, generally one for chemistry and one for physics; 30 square feet of floor space must be allowed for each scholar, the minimum size of each room being 600 square feet. Proper fittings must be provided, and a balance-room may also be included. A lecture-room with an area of 750 square feet is said to be desirable, together with a small preparation room. A drawing-classroom for "the more advanced drawing" should contain 30 square feet of floor-space for each scholar, the best size being a room with 750 square feet. If the building is planned with a central hall, and if this is properly lighted, it may be used for the drawing class, good dimensions for such a hall being 50 ft. by 25 ft. As an alternative, the hall may be used as a gymnasium, an area or 1,800 square feet being required for a school of 300 children. The gymnasium should not be adjacent to the laboratories. Special rooms for cookery, laundry work, and manual instruction should be provided in accordance with the rules in Schedule vii. of the Code. It is to be hoped that the issue of these rules betokens a desire on the part of the Board of Education to encourage the erection of higher elementary schools, but in the present unsettled state of local educational authorities it is doubtful whether much progress will be made in the immediate future.

St. George's Church, Botolph-lane, E.C.

AN Order in Council has been made for ratifying a scheme of the Ecclesiastical Commissioners for effecting a union of the two rectories of St. Mary-at-Hill with St. Andrew Hubbard and St. George, Botolph-lane, with St. Botolph, Billingsgate. The scheme provides for the constitution of one consolidated benefice, with the Church of St. Mary-at-Hill as the parish church, and for the demolition of the church of St. George, Botolph-lane. The latter church, which has been closed for some five or six years past, was built in 1672-4, at a cost of 4,510*l.*, from Wren's designs. It is built of stone, and has a plain exterior, but it presents some pleasing features characteristic of Wren's London churches—a tower that rises directly from the ground, and a solid unbroken basement story which gives a stability of appearance to the entire structure. The tower, 16 ft. square at the base, rises by three stages to a total height of about 85 ft.; it has a cornice and a dead-panelled parapet, with angle piers which carry vase-shaped pinnacles. In the interior two Corinthian columns, widely spaced, on each side, divide the aisles from the nave. The roofs of the aisles are flat; the nave roof is arched in sections. There is a reredos of oak with a Corinthian order. The church, which was repaired in 1836, and again in 1884, measures 54 ft. by 36 ft., and is 36 ft. high. The rectory passed from Bermondsey Abbey to the crown at the Dissolution. Since the Great Fire the parish has been united with that of St. Botolph, Billingsgate. The Commissioners further provide for the removal to St. Mary-at-Hill church of the font, communion-table, sacramental plate, organ, carved woodwork, and other fittings, now in the church of St. George; but if any of those fittings are not needed for St. Mary's they will be transferred to a new church, which, with a parsonage house, it is proposed to build in or near London with the proceeds of the sale of the site and materials of the church of St. George. The provision for transferring the organ to St. Mary-at-Hill seems indeed absurd on the face of it, as that church possesses already an unusually large and fine organ with a fine carved case.

The Grammar School, Monmouth.

PLANS have been prepared by Mr. Henry Stock, architect to the Haberdashers' Company, for new school buildings at Monmouth. In 1614 William Jones—who made other large benefactions to the Company—gave a sum of 9,000*l.* to the Haberdashers for the endowment of a preacher, a free school, and almshouses for twenty aged poor in Monmouth. The Company expended 3,400*l.* in the purchase of a site and the erection of the several buildings, including houses for the schoolmasters and preacher, or lecturer, and bought an estate of 349 acres at Hatcham, New Cross, to furnish an income for the charity. A scheme was made by the Court of Chancery in July, 1854, for regulating the amounts of various payments to the beneficiaries under the trust. In an official return made twenty years ago the annual income of the endowment is given as 4,507*l.* 7s. 5d., of which amount, it seems, a yearly sum of 3,207*l.* 7s. 5d. was appropriated to the school, and one of 1,000*l.* to the almshouses and almspeople. The Haberdashers' Company rebuilt the almshouses, in 1842, at a cost of 7,000*l.*

Pictures by the late W. Stott.

WE do not know that it was much of a kindness to the late Mr. William Stott—"of Oldham" (as he chose to call himself), to have got together a collection of his pictures for exhibition. He was an artist who had genius, very much marred by eccentricity and (apparently) imperfect training. It was only in such recent works as "The Awakening of the Rose" and "Autumn," both which are here, that he seemed at last to have hit on a settled path in art which would have been worth pursuing. The "Rose" is a remarkable picture, both in colour and conception; and the portrait of a man in a seaman's dress

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is a good piece of effective and straightforward portrait painting. Most of the other works (in the Water-Colour Society's gallery) we prefer, on the principle "de mortuis nil nisi bonum," to pass over. The preface to the catalogue, written by a popular novelist who appears to have been a friend of the painter, is one of the most absurd pieces of extravagant adulation we have ever seen even in catalogue prefaces. The unfortunate painter might well have said, "Save me from my friends."

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

ANNUAL DINNER AND VISIT TO GLASGOW.

The annual dinner of the Royal Institute of British Architects was held in Glasgow on Thursday last week, at Windsor Hotel, St. Vincent-street, many architects from London and the provinces being present. The chair was occupied by the President of the Institute, Mr. William Emerson, and among other gentlemen present were Principal Story, D.D., Sir James Marwick, LL.D., Town Clerk of Glasgow; Sir Thomas Drew, P.R.H.A., Bailie Cleland, the senior magistrate; Dean of Guild (Mr. Robert Gourlay), Professor George Adam Smith, D.D., Mr. Alexander Cross, M.P., Mr. John Wilson, M.P.; Mr. John Belcher, A.R.A., Mr. Thomas E. Collcutt, and Mr. John Slater, Vice-Presidents of the Institute; the Deacon-Convener (Mr. James Macfarlane), Mr. C. H. Dick, President of Glasgow Chamber of Commerce; Dr. James Finlayson, President of the Faculty of Physicians and Surgeons; Mr. W. R. Copland, Chairman of Glasgow Technical College; Mr. James Fleming, President of Glasgow School of Art; Mr. C. H. Channon, President of York Society; Mr. J. E. Christie, President of Glasgow Art Club; Mr. C. E. Whitelaw, President of Glasgow Architects' Association; Bailies J. King, Shearer, Sorley, Maclay, and W. F. Anderson; Mr. J. J. Burnet, A.R.S.A., President of the Glasgow Institute; Mr. J. M. Taylor, LL.D., Dean of the Faculty of Procurators; Professor Gourlay, Mr. Ernest George, Mr. William Fawcett, F.S.A., Mr. F. H. Newbery, Mr. Henry F. Kerr, President of the Edinburgh Architectural Association; Mr. John Muirhead, President of the Institute of Measurers; Mr. Alfred Darbyshire, F.S.A., President of the Manchester Society; Dr. Donald Mackintosh, Mr. Thomas Mason, Mr. S. Perkins Pick, President, Leicester Society; Mr. Frank Caws, President, Northern Association; Mr. Arthur Clyne, President, Aberdeen Society, Mr. W. J. Locke, secretary of the Institute; and Mr. C. J. MacLean, secretary, Glasgow Institute. The croupiers were Mr. Leonard Stokes, Mr. E. W. Mountford, Mr. Alexander Graham, F.S.A., hon. secretary of the Institute; Mr. Edwin T. Hall, Mr. P. Gordon Smith, and Mr. Henry T. Hare. Among other gentlemen present were Messrs. E. Boardman, H. D. Searles Wood, A. B. Plummer, H. G. Ibberson, Clyde Young, A. Hessell Tiltman, R. S. Balfour, W. A. Pite, E. J. Milner Allen, T. W. Cutler, G. Guthrie, R.S.A., J. H. Pentland, R.H.A., W. Flockhart, J. D. Crace, Hippolyte J. Blanc, R.S.A., J. J. Stevenson, F.S.A., John Honeyman, R.S.A., C. Harston, A. Cullen, W. Forrest Salmon, W. Henman, G. D. Oliver, Geo. Frampton, A.R.A., J. Keppie, J. Douglass Mathews, Campbell Douglas, J. Ely, Alex. McGibbon, W. Kerr, T. Martin Cappon, W. Tait Conner, J. Lochhead, D. R. Niven, Wm. Leiper, W. Reynolds-Stephens, H. K. Bromhead, J. C. Nicol, and J. Salmon, the company numbering nearly 200.

After dinner, the Chairman read letters of apology for absence from Lord Rosebery, Sir James King, Sir John N. Cuthbertson, Sir Francis Powell, Mr. Aston Webb, Dr. Rowand Anderson, and others. He also stated that the Imperial Union Club of Glasgow had made the members of the Institute honorary members of the Club during the period of their meeting in Glasgow. He was sure they would join in passing a vote of thanks to the Club for their kindness. This having been heartily agreed to,

The Chairman proposed the toast of "The King." He said that for the first time in the history of the Institute the first toast of the evening had to undergo a change. The King, shortly after the death of Queen Victoria, at the request of the Institute, very graciously consented to become their patron, and also promised to continue the presentation of their annual gold medal. For this they were greatly indebted to his Majesty, for there was no art that tells in history of the greatness or the aspirations of a country better than the work of architects. Architecture could be greatly influenced by royalty, by the interest which a monarch took in their art, and the King had always shown considerable interest in the arts of the country. He believed the art of architecture, the mother of all the arts, would be greatly influenced during the reign of King Edward.

The toast having been honoured, as was also that of "Queen Alexandra, the Duke and Duchess of Cornwall and York, and the other members of the Royal Family," (which was likewise given from the chair),

Mr. John Belcher, A.R.A., gave the toast of "The Houses of Parliament." Educational matters and scientific questions were not, he said, neglected by the Houses of Parliament, but the consideration of the art of architecture was apt to be regarded by Parliament as not so much a necessity as a luxury, which an economical Government did its best to avoid. What was to be learnt from Glasgow as to that? The answer to that was: the Exhibition buildings, which had conduced so much to the financial success of the Exhibition. There were also the municipal and other public buildings of Glasgow; in fact, this great city, given over to work and commercial interests, had not forgotten art, for it was clever enough to know that art paid, as well as gave pleasure. Another pleasing effect which one observed in Glasgow was that the people loved their work and took a pride in it, and this it was which art enabled them to give expression to in their buildings, and it was this feeling in Glasgow which they wanted the Houses of Parliament to have. As was well known, new public offices were about to be put up upon magnificent sites, and it seemed to be the opportunity of the century to beautify the very centre of Imperial government, and to express by the buildings something of the dignity and importance of the matters carried on there. In deference to public opinion, he believed, two able architects were selected to make designs for the buildings, but, as every one deplored, those gentlemen did not live to carry out their designs. The carrying out of the designs would have been the most important part of the work, and he was convinced that the great experience and knowledge of Mr. Brydon and Mr. Young would have enabled them to carry out their work with great success. It was now proposed to put the matter into the hands of the Office of Works! Now, in going to war Parliament would appoint the best generals they could to carry it out, and should one be recalled or killed, his place would be immediately taken by another general. That he believed was the procedure in other Departments. Then why not in the case of public buildings? How many great architects were employed before St. Peter's at Rome was completed? If the history of a nation were read in fine architecture, then these buildings would represent to posterity the indifference and apathy of all concerned. He did not wish to find fault entirely with Parliament in this matter, for Parliament only represented the general apathy. In proposing the toast, and in coupling with it the name of Mr. Alexander Cross, he expressed the hope that that gentleman would use his influence to see what could be done to get Parliament to treat the art of architecture with greater respect and consideration.

Mr. Cross, M.P., in the course of his reply, said, in regard to the duties of Parliament towards the architecture of the country, he believed that Parliament had to some extent risen to the occasion. Nowadays we did not destroy our old monuments, and we did not make our old castles and other old buildings quarries for material for building farmhouses; and he thought the same spirit would enable them to rise to the occasion in the erection of public buildings. As to the two public buildings in question, although it had been announced as the intention of the Government to entrust the carrying out of the detail of one of those buildings to the Office of Works, the other building, the War Office, was entrusted to the son of the deceased architect, and in his (the speaker's) opinion no better appointment could have been made. As to the other building, should there be any occasion for raising the question of a better arrangement being made for carrying out Mr. Brydon's design than the one proposed by the Government, he did not think that any considerations of economy would be likely to interfere with the realisation of a better arrangement. He had been much struck at the improvement in the architecture of London; and in contrasting the buildings erected twenty-five years ago with those erected now, especially in some of the suburbs, he had been much impressed by the enormous development which had taken place. He had visited foreign cities and many parts of Europe, and he doubted whether in any other city they would see finer modern examples of the art of architecture than were to be seen in the new parts of London.

Mr. John Slater, B.A., then proposed the toast of "The Corporation of Glasgow." The history of the country, so far as regards its peaceful reform and progress at home, was written in the archives of the municipalities of the kingdom. In early days, for security of trading, people banded themselves together in associations which were called trade guilds, and these soon developed into the famous communities of merchants' guilds, gaining enormous power. It was a most interesting story how the trade guilds, as opposed to the more select merchant guilds, gradually acquired powers of their own and then merged with the merchant guilds, and so became the nucleus of the municipalities. The development went on on the same lines all over the country, retarded here and accelerated there by local causes, but in all cases the result had been very much the same, whether the head of the community was the Lord Mayor of London or the Lord Provost of Glasgow. There could be no doubt that the fine organisation which was controlled by the Glasgow Corporation was the result of small accretions and extensions from time to time and that the corporation was doing now for that great city much the same sort of thing that was done 800 years ago when market tolls and that sort of thing were regulated. In the south of England the efforts of various municipalities to obtain increased powers had been viewed with some disfavour, especially when they had gone into trading affairs, such as gas, tramways, &c., but he could not but think that it was to the interests of the community that the corporation should control such monopolies because, if properly managed, they must result in profit, and it was far better that the profit should be shared by the whole of the citizens than go into the pockets of private shareholders. He thought that even Glasgow might go further. They looked after the physical health of the people; why not look after their mental and moral health? They had municipal bands; why not municipal theatres, public-houses, and even music-halls? The cost of crime, pauperism, and drunkenness was considerable, and when this cost was increased by the wretched surroundings in which numbers of people of such a city were compelled to live, he thought that, from the money point of view, it would be well to take in hand the amusements and recreations of the people. He thought that some city like Glasgow might take in hand this work. Glasgow had made enormous advance in greatness and in many other ways, but size was not everything, and it was to be hoped that the Corporation would take in hand the beautifying of the city and the brightening of the lives of its inhabitants.

Bailie Cleland, in response, referred to the absence on the high seas of the Lord Provost, who, but for his departure on a well-earned holiday, would have been present. It was always gratifying to the Corporation to know that their efforts in the interests of the city and their labours to promote the well-being of the citizens were appreciated and valued by those outside of the civic arena. It was to him, and he was sure he spoke for the other members of the Town Council, peculiarly pleasing to be assured of the good opinion which the Royal Institute of British Architects entertained of the Municipality of Glasgow. Their approbation, he took it, was not based on sentimental grounds, nor was it prompted by considerations of courtesy merely. He believed that in their hearty reception of the toast they deliberately wished to give expression to their sense of the important work which, in a variety of directions, the Corporation was endeavouring to perform. None of the important bodies which had visited Glasgow

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this year, and whom the Corporation had been delighted to honour, was in a better position to judge of the value or otherwise of the various ramifications of civic enterprise than the Institute of Architects. The Corporation, in almost every one of its Departments, was indebted to the architectural profession, for to it they must look for adequately housing the hundred and one interests which the Town Council controls. Much of the success which had attended the operations of the Corporation, and a great amount of the commendation which it had received from the strangers who had from time to time been within its gates, for the manner in which it had faced the various municipal problems, must be attributed to the enlightened manner in which their own staff of capable architects, as well as those talented professional men outside, whose assistance they had been fortunate in securing, had interpreted the requirements of the City, by designing not only handsome and ornate edifices, but also structures which combine with their external perfections commodious and appropriate internal equipment for the purposes for which they have been erected. He invited the members of the Institute of Architects during their meeting in Glasgow to inspect the various buildings in which the Departments of the Corporation are housed, not to speak of the tenements of dwelling-houses which had been erected for the working-classes under the auspices of the City Improvement Trust, the policy of which had been largely controlled by the present Lord Provost, who had lived to see his efforts crowned with the most gratifying success. The tenements which the Corporation have thus erected were intended to supply the working-classes, at a moderate rent, with houses in which they will be able to live with their families under conditions of greater comfort and happiness than was possible in former days. He thought no architect could address himself to a nobler task than that of designing houses for the artisan classes of such a character as to secure at once a pleasing elevation to our public streets and a fit habitation which would more nearly interpret the proverbial phrase that "Every man's house is his castle," than had yet been possible. The idea had often occurred to him when viewing the long vistas of our public streets that greater variety might be introduced and a larger amount of genius displayed in the designing of ordinary street architecture, so as to do away with those continuous lines of tenement of almost geometrical formation, each one like its neighbour, which our present system presents in monotonous regularity. He knew that the answer to this statement would be that it had not been possible for architects to effect any great improvement in the direction he had indicated, as they were restricted by the requirements of their clients, whose desire often was to obviate unnecessary cost in construction, while securing all needful accommodation and facilities. Builders might argue that, from an æsthetic and sentimental point of view, such designing might present a more artistic exterior, but that that had nothing to do with utility. Be that as it may, and whether we were all severe utilitarians or not, he could not allow the opportunity to pass without appealing to the gentlemen in whose hands the architectural reputation of the country rests, to endeavour to break away from the hard and fast rules which apparently obtain in the matter of the domestic architecture of large towns.

Ex-Bailie Shearer, in proposing the Royal Institute of British Architects and Allied Societies, traced the progress of the Institute since its foundation in 1834, and dwelt upon its objects. What greater boon could be given to a city than healthy homes? And what could make life in a city sweeter and brighter than the embellishment of that city by artistic buildings and beautiful parks? Although Glasgow was a city of toilers, they could point to beautiful spots in their midst, and to buildings worthy of a visit even from the Royal Institute of British Architects. Architects had taught them that light, airy, and sanitary dwellings for the poorest should be always associated with beauty of line and harmony of colour, and that grace, dignity, and beauty should always be associated with our public buildings; and that teaching they would strive to carry out. With the toast he coupled the names of the President of the Royal Institute of British Architects and the President of the Glasgow Institute of Architects.

The Chairman, in responding for the Royal Institute, said it was the first time in the annals of the Institute that their annual dinner had been held in Glasgow. He would like to impress upon them this point, *i.e.*, that the Institute is not the Royal Institute of English Architects, but the Royal Institute of British Architects. It took in the whole of the British Empire—England, Scotland, Ireland, and Wales, the Colonies, and India. In all these there were societies in alliance with the Institute. Their numbers, including the allied Societies, amount to nearly 3,000. The Charter was granted by King William IV. in 1837, which year was also the first of Queen Victoria's reign, who graciously became their patron. In 1887, in order to bring the powers of the Institute more into line with the work it aspired to accomplish, and to render the fact of membership to a certain extent a test of proficiency, the supplemental Charter of the fiftieth Victoria, conferring among other privileges power to hold examinations and issue certificates or diplomas, was granted, the document receiving the Royal sign Manual on March 28, 1887. Since then large numbers of candidates had each year presented themselves for examination. When they got a body of men like this spread all over the Empire with one object in view, there ought to be no doubt of the success of their aims, and he did not think there could be any doubt as to the eventual success of those aims, which were the advancement of their art, and the elevation of the profession of architecture. When at a great city like Glasgow, in a country the birthplace and home of so many eminent and shining lights in the history of culture, and art and science, men were brought together from all directions as a means of promoting good feeling amongst the members of a great profession, and to extend its influence, there certainly should be good fruit borne. It was a peculiar pleasure to them to hold the first Royal Institute of British Architects' dinner of the new century in Glasgow with their allied society, for the people of Scotland had always taken a prominent part in the advancement of the arts and a leading position in things appertaining to culture—Edinburgh had been dubbed our modern Athens. In literature, the mention of only one or two names such as Burns, for instance, with his tenderness and genius for descriptive power, passion, and love of Nature; or Professor Wilson, in the exuberant humour and force displayed in the "Noctes Ambrosianæ"; or Scott's, whose works had charmed them all, and did so much for the revival of Gothic architecture; and the deep influence over all thinkers of the works of Thomas Carlyle, claim for Scotland a place in the first rank of letters. In painting, such names as Sir David Wilkie or Sir Henry Raeburn and David Roberts, a name ever dear to architects, claim also for Scotland a foremost place in the rank of great painters. And in architecture, names like the brothers Adam, Fergusson, and the Mylne family, who for twelve generations had been designing and carrying out important works, were sufficient also to place Scotland in the first rank of architectural art. Of late years, the experience of their Institute, if it told them anything, pointed to great progress in the work of their students in architecture, which promised well for the future of their art in this new century, and Scotland was well to the forefront here. Many of their best medals and prizes had been carried off by the young architectural students of Scotland during late years, and the young Englishmen and Irishmen would have to look to their laurels. The Royal Institute of British Architects knew no partiality; progress in the art of architecture was what it wanted, and all honour was given to whom honour was due. Glasgow itself and their allied society had done much for architecture of late years. The art galleries and municipal buildings, as well as many other works, proved its desire to foster an art in a manner worthy of the great Empire of which it formed a part, and the Exhibition buildings showed a restraint and excellence in this class of design which he had only seen equalled or surpassed by the World's Fair at Chicago, where there was no rococo extravagance of detail, but a fine monumental effect, grand and imposing—a city of palaces; and it was a pity the buildings were only temporary. At Chicago they had, however, the advantage of unlimited means; and a consensus of taste of a large committee, formed of architects, artists, and scu'ptors, not only Americans, but also from the pick of Europe, ruled the schemes. He felt sure that the high objects and interests for which the Institute was formed and obtained its charter—namely, the advancement of the art of architecture and the dignity of the profession—would be worthily upheld and maintained by the Glasgow society. From the work of architects would be derived the impression that future generations would have of our national greatness or meanness, our high or our low aspirations, rather than from all our wars, or even from all our other arts. It was, therefore, no mean task they found themselves engaged in at the beginning of this century in the striving to carry out the views of those who were the founders of this great Institute of British Architects. Let them pull well and honestly together, and their influence must increase yearly and should, before long, obtain for them some proper legal recognition as a great profession on wise lines that would materially advance the ends they had in view. If advancement of the art of architecture was the principal of these ends, then the voice of this Institute and its allied societies should give no uncertain sound on all important public projects where architecture was concerned. In the extension, improvements, and rebuilding of our great Metropolis and of the large provincial centres, and also in great Government and other public buildings, surely it was the consensus of the architects' opinions which should be the guide and should carry the greatest weight. We saw much discussion in papers and journals by artists engineers, and Parliamentary Members, County Councilmen, and others on questions of public improvements and the erection of public buildings, but how often had any of these individuals the proper qualifications to lay down the law on such subjects? It should be the consensus of opinion of an Institute like theirs, with its allied societies, that should carry the most weight if they would only, in a public-spirited manner, let themselves be heard on such matters. But if they expected their influence as a body of professional men or as an Institute to have weight they must all be true to themselves and consistent in their conduct. He mentioned this because there seemed a spirit abroad that the rush for employment caused sometimes, either under the temptation of personal interests or the chance of some great architectural prize, actions or words subversive of the very principles of professional conduct which they had themselves laid down. Such action must quickly cause the influence of an Institute like theirs to wane, nor would their word or opinion on momentous public questions of policy in regard to their art receive much respect from the public or those in authority if it be found that their utterances were inconsistent or intended to serve selfish interests. Any influence their profession might be able to exercise, and the history of its late years showed it had considerable, must be above suspicion and apart from party or personal ends. Let them do nothing to weaken their position, and endeavour to act amongst themselves as they wished the public to act by them.

Mr. J. J. Burnet, in the course of a brief reply, said the Glasgow Institute had watched with intense interest the endeavours they had been making to increase the public appreciation of architecture in the Metropolis, and had recognised with no little pride the eagerness with which the counsels of the Institute had been sought, not only by the Government, but by the various municipal and other authorities throughout the country; and while in some few cases the advice of the Institute might not have met with the unanimous approval of the profession which one would have desired, he did not think that great weight need be attached to such criticism. In their art they learnt to wait for the verdict of future generations, who alone were able to judge how far the men whom the Institute may have placed in important positions had warranted the choice and done honour to the profession to which they belonged. The Glasgow Institute, as a corporate body, as well as individually, were endeavouring quietly to meet the various responsibilities of our time, and he ventured to believe that the presence with them that night of so many of Glasgow's eminent citizens, and the reception given to the toast on this the first visit of the Institute to Glasgow, might be looked upon as some proof that the city was steadily growing in its appreciation of architecture. They could not

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hope that in a large commercial and industrial centre like Glasgow the art of architecture would be generally understood and appreciated, but they knew that amongst those responsible for the various municipal and private schemes there was a growing conviction that such schemes would remain monuments, not only of commercial and industrial enterprise, but would be looked upon as indicating their state of culture at the time, and the need then felt that the material surroundings should be in sympathy with the deeper needs and loftier aspirations, and they looked forward with confidence to the growth of this feeling, eager to render themselves more competent to give it expression.

The remaining toast was "The Guests," which was humorously proposed by Mr. Campbell Douglas and acknowledged by Mr. John Wilson, M.P., who referred to Glasgow Cathedral as a building which not only answered the purpose for which it was designed, but owed its beauty, not to meretricious ornament, but to its form.

The company then dispersed after singing "Auld Lang Syne," after which some of the party proceeded to the Imperial Union Club.

On the following day, on the invitation of the President and Council of the Glasgow Institute of Architects, a large party of ladies and gentlemen partook of luncheon in the Grosvenor Restaurant in the Exhibition grounds.

After luncheon the Chairman, Mr. J. J. Burnet, President of the Glasgow Institute of Architects, proposed the toast of "The King," and briefly but cordially welcomed the guests.

Mr. Emerson said that after the very hearty welcome the Glasgow Institute had extended to the Royal Institute they could not separate without toasting the President and members of the Glasgow Institute. In any profession like that of architecture, the distance at which members practised from one another caused them to know very little of each other, and in the different localities in which they practised there were differences in views on certain public questions affecting architecture, and there were also different modes of working in most organisations. But such meetings as they were having in Glasgow tended very much to enlarge their minds by an exchange of views and by a realisation of the differences of opinion which existed. Moreover, there was rather a tendency to think slightly of people one did not see or know, but such meetings did away with these ideas. He had learnt a good deal during his visit to Glasgow, and he was sure others from the south had done so.

The toast having been heartily received,

Mr. Burnet, in response, expressed regret that the visit to Glasgow had not been arranged for a longer period.

Mr. W. F. Salmon suitably proposed "The Ladies," Sir Thomas Deane responding.

The proceedings then terminated. In the afternoon a large party of architects, ladies, and friends visited the University on the invitation of Principal Story and the Senate of the University. The guests inspected most of the principal rooms in the building, including the Hunterian museum and the library, where tea was provided.

In the evening a reception was given by the Corporation of Glasgow. The guests promenaded the salons and corridors of the Municipal Buildings, and at 8.30 there was an adjournment to the banqueting-hall, where Bailie Cleland, in the absence of the Lord Provost, occupied the chair. The Chairman, after welcoming the members and friends of the Institute, remarked that Glasgow as a city had no reason to be ashamed of the examples of architectural skill which her thoroughfares presented, and he could safely say that in the city members would find many most interesting examples of both ancient and modern architecture. He felt that the influence of such meetings as those of the Institute of British Architects and of the other important organisations which had preceded it was of no ephemeral character, but rather of far-reaching and lasting importance on the life of the community in whose midst they were held.

Mr. Emerson expressed the thanks of the Royal Institute of British Architects to the City and Corporation of Glasgow for their kindness to the members of the Institute during their visit to Glasgow. Glasgow had done a good deal in furtherance of the art of architecture, and no one could go about the city without learning something from the great public buildings which had been erected. He had been particularly impressed by a visit to the enormous power station for the electrical supply to the tramway system, where some of the engines had fly-wheels weighing 120 tons. Similar sensations could be caused by works of architecture, and probably no greater sensation could be caused than by a visit to a great cathedral. No one who went through the Glasgow Exhibition art galleries or saw the buildings of the city could fail to realise that the city took pains to encourage the erection of works which should be architecturally pleasing and interesting, and add to the lustre of the British Empire.

Mr. Burnet briefly addressed the audience, remarking that no corporate body of the citizens of Glasgow was more anxious to be of service to the city than the Glasgow Institute of Architects.

An excellent programme of music was gone through during the evening by Herr Iff's orchestra and the Corporation band, while vocal music was given by the Glasgow Glee Party. A very enjoyable evening was spent by the large party present.

MAGAZINES AND REVIEWS.

The *Art Journal* has an illustrated article on "The Minor Sculptures of the Certosa of Pavia," that building of multifarious detail and never-ending interest. The article is by Professor Melani—a translation we presume; he gives some information as to the names of artists presumably connected with the work, though we feel rather sceptical as to the authenticity of these ascriptions. Among the details illustrated are the carving on one of the choir stalls, a bronze candelabrum of great richness and beauty, and the carving of the capitals and entablature of the principal doorway. An article of more exceptional interest is that by Mr. Arthur Tomson on some of the less-known pictures of Millet. They are illustrated from photographs which came into the writer's possession through a friend who had picked them up somewhere in Paris. They belong to the early period of Millet's art, when he painted chiefly nude and classic subjects, and will be a revelation to those who know him only by pictures of the class of the "Angelus" and the "Sower." One or two pictures by Millet of this period have found their way into London exhibitions, and have been noted in our columns; but none so remarkable as those that are here illustrated. About two of these, "Les Baigneurs" and "Le Sommeil de Venus," there is a power reminding one of Michelangelo. It may be as well for the world that Millet in his later period adopted peasant life as his subject, for otherwise we should have missed the most remarkable illustration of that class of life in painting; but we are disposed to think that he was really a greater artist in these very different works of his earlier period. Ought not some effort to be made to collect and exhibit these earlier works of Millet's? It would be an exhibition of rare interest, and would revolutionise popular opinion in regard to this remarkable artist.

The *Magazine of Art* contains an article on a very interesting subject, "Idealism in Contemporary French Painting," by M. Camille Mauclair; probably a translation. He regards what he calls Idealism (the nature of which is best illustrated by the examples from M. René Ménard and others) as a distinct movement in French painting, which has succeeded to Impressionism. Henri Martin, to whom he does not quite do justice, was one of its earliest apostles. We quite agree as to the spiritual beauty of the compositions of M. Ménard, which form the bulk of the illustrations. The essay is to be continued in another issue. The "Decoration of Upright Pianos" is treated by Mr. Aymer Vallance, whose criticism on the subject is good and suggestive. We quite agree with him as to the first illustration which he gives having nothing of the appearance of a piano; it might be a sideboard. Bechstein's piano for the North German Lloyd Company is, on the other hand, too *rococo* and the other more classically-lined examples are somewhat too square-cut; no example of those given is what we shall call an ideal design. Mr. Ogilvey's piano with folding doors, for Messrs. Broadwood, is excellent in style, but the doors standing open on each side of the player are a nuisance. Mr. Vallance's suggestion at the close, as to acknowledging more, in the shape of the case, the vertical arrangement of the strings, merits consideration. We must protest against ornament being applied to the keys themselves. Mr. Vallance recognises, indeed, that they ought to appear as a general contrast of black and white, but he proposes that the upper surface of the keys may be enriched with "delicate filagree ornament." That is entirely out of place, and distracting to the player. The glory of the keys lies in what is done with them, not in their appearance; and they should be left perfectly plain.

The *Artist* contains an article on "Ancient Peruvian Pottery," with some curious examples from a private collection about shortly to be dispersed—that of Sir Spenser St. John, formerly the English representative in Peru. "Garden Sculpture especially in reference to the Fountain," by Mr. P. G. Konody, is a good subject in itself, but seems introduced here only to illustrate the work of one artist, or rather of two who work together, and the designs are somewhat eccentric and not very pleasing in line. A charming frontispiece to the number is formed by a study of a head in red by Mr. Greiffenhagen, whose pictures form the subject of an article.

The *Berliner Architektur-Welt* contains illustrations of a fine piece of school architecture by Herr Hoffmann, the "Parish School" (equivalent we presume to our "Board School") in the Dunckerstrasse. It is, however, a building of greater size and more formal treatment than a London Board School building. Externally it is a brick building with thin stone courses at intervals, which are made lineable with the heads, sills, and transoms of the windows, thus binding the whole together. The interiors, though not ornate, are treated with some view to effect, especially in the use of decorative ceilings with flat ornament of somewhat Elizabethan character. The plan is extremely simple; a long parallelogram with the administrative entrance and offices in a centre block, and large hall over, the wings right and left symmetrically arranged for boys on one side and girls on the other, with their entrances at the ends. The whole seems an admirable building for its purpose. A good deal of space is devoted to competition designs for churches and other buildings at Grunewald. The square or nearly square plan seems rather in favour for the churches; very much diversified externally, however, by a collection of gables and other features. The designs are of what in this country would be thought a very weak Gothic type.

The *Architectural Review* (Boston), Vol. VIII., No. 9, contains an article by a Mr. Edward R. Smith, Reference Librarian in the Avery Architectural Library, Columbia University, on "Architectural Periodicals;" an article which shows a good deal of ignorance and the usual determination to write up everything French. He has even the assurance to say that the illustrations in English journals "are disappointing to one accustomed to the superb plates of the great German and French journals." Perhaps he will state *what* French architectural journal it is the illustrations in which are equal to those of the best English journals? The *Revue Générale*, we admit, was superior to any English journal in this respect, but it has been extinct for twelve years, and it was a monthly publication—not even that in fact, for it published just when convenient; and the writer of the notice referred to must be very ignorant if he does not know that illustrations to a monthly paper are got up and printed under conditions quite different from those by which weekly publications are governed, and much more advantageous, and that any comparison between them is entirely misleading. This is the case also with the German publications; those that are referred to as having such fine illustrations are monthlies, not weeklies. If there is a single weekly architectural publication in Germany with illustrations comparable to those of the English architectural journals, we shall be glad to hear of it. We have never come across any such, and we think Mr. Smith will be puzzled to find one; and that our readers who know the French journals will be amused to read that *La Construction Moderne* is an architectural paper superior to the English ones.

The *Antiquary* contains an article, by the Rev. E. Maule Cole, on "Norman Features in Wold Churches, East Riding, Yorkshire;" meaning the churches of the Chalk Wolds of the East Riding—little known, the author says, even to Yorkshiremen. In 1070 the whole of

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this district was devasted by order of the Conqueror, and the existing churches would have been then destroyed or so much injured as to require rebuilding when the manors were eventually portioned out among Normans. The object of the first devastation is not mentioned — perhaps is not known. But the circumstances, as far as known, explain the existence of a good deal of Norman work in the churches of the district, which are mentioned and described. The article will open to some architectural tourists a new corner of interest in England. The same number contains the concluding portion of an article by Mr. W. H. Jewitt on the interesting subject of "Winged Beings" and their delineation in art.

In the *Engineering Magazine* Mr. Longmuir's article on "Opportunities for Bettering the Work of the Foundry" should have the attention of foundry managers. He speaks strongly on the want of system in foundry work, and the content with which inferior plant is accepted, especially in the matter of moulding machines.

"A moulding machine is installed, but not operated. The preliminary expense of this machine was met with pleasure, but the necessary accessories were fitted up on the cheap system. Moulding boxes were good enough without fitting, plates would answer quite well without any expensive machining up, and therefore the handy-man of the establishment prepared both the boxes and plates. This machine now stands in 'icy isolation,' a superb monument to the folly of the cheap system. The arrangement of the foundry is in keeping with the tools—no mechanical appliances of any kind, and every ounce of metal, every lift, is carried or performed manually. Boxes are stacked anywhere, and generally in the most inconvenient places. Foundry supplies are equally inaccessible, and the moulders spend no inconsiderable time in searching for material. . . . . The method of working is equally haphazard; the moulds are slovenly made, put down in any corner that strikes the man's fancy; hence all classes of work are indescribably mixed, and the appearance of the floor just before casting time is one of bewildering confusion.

The example quoted is not that of a foundry suffering from want of capital, nor yet that of an establishment making no profit, and many similar instances may be found amongst the jobbing foundries. If profits are made under these slothful conditions—and they undoubtedly are—then a most magnificent opportunity lies already at hand to increase these profits manifold."

The author proceeds to specify what should be the improvements made in order to realise this possible result. There is also an article on "The Rapid-Transit Problem in London," by Mr. F. J. Sprague, an American engineer of special experience in city railway working; so that we here have a criticism of the London system (if it can be called a system) from a foreign expert. Mr. Sprague is strong in condemnation of the useless weight and inconvenience of the heavy locomotives used on the Central London Railway, and advocates for our adoption what he calls the "multiple-unit" train.

"This is a method of train operation and control by means of which cars are equipped with motors and motor-controllers individual to these cars, so that they may be united with any number of other cars similarly equipped, or with any number which have no motors, into a train of any length, and operated from as many points as desired through a controlling line common to all cars. The number of the cars, their sequence, and their end-to-end relation are preferably matters of indifference. The character and capacity of the equipment is dependent upon the schedule required; it varies from every car, where the highest schedule is required, down to two cars in a train. Every motor car is a unit, and any combination of motor cars and trail cars may also be considered a unit, which can be operated from either end, and can be joined with other units.

Such a system readily lends itself to every condition of congested service. The similarity of equipment ensures flexibility of train operation, and provides a motive power proportioned to the requirements. Locomotive switching operations are abolished, trains can be reversed at any cross-over, and traffic concentrated on any section of a road.'

The adoption of some such system, if electrically-worked Metropolitan railways are further developed, seems almost a foregone conclusion.

In *Feilden's Magazine* the article on alternating current motors by Professor A. Hay is an extremely instructive one. He describes clearly the difference between synchronous and non-synchronous motors both for single phase and polyphase currents. Students will feel obliged to Professor Hay for clearing away the many difficulties in this somewhat abstruse branch of practical electrical theory. We cannot do better than recommend his article for their diligent perusal.

In the *Contemporary* "Vernon Lee" gives the second and concluding portion of her essay on "Art and Usefulness." Apart from what we have already spoken of as the central heresy of the writer's position, which confounds the intellectual suggestions and the intellectual enjoyment of art with mere usefulness, there is much more in this second part of the essay that we are able to sympathise and agree with than in the first part. The author seems indeed rather disposed to go back on her former position by admitting that "art cannot be enjoyed with initiation and training;" but she holds that wherever art has existed spontaneously, it has brought with it that initiation and training. "The initiation and training, the habit of understanding given qualities of form, the discrimination and preference thereof, have come, I maintain, as a result of practical utility." As far as decorative and industrial art are concerned this may be true; but where is the utilitarian basis of the ceiling of the Sistine Chapel, or of Titian's "Bacchus and Ariadne?" Was that wonderful picture-poem, at the time it was painted, any better understood by the uneducated of that day than it is by the uneducated of this day? The author is trying to push her theory to cover phases of art which it will not cover. In other parts of the essay we come on true and important reflections in regard to art. One of these is in regard to the "fragmentary, superficial attention" which, according to Vernon Lee, most of us give to a work of art; "and giving this little, we find that art gives us little, perhaps nothing, in return." Vernon Lee is rather too sceptical as to the real attention which lovers of art in this country do give to it, and the real enjoyment they derive from it; but it is true that such lovers of art are in a very small minority among us, and that this careless and superficial attention is the characteristic of the average modern English mind towards art. One reason that the French are a more artistic nation than we are is that they do consider art as something worth thinking about and discussing seriously, as if it were a thing of national importance; while by the English public mind it is regarded only as a kind of toy. Later on she endeavours to suggest the remedy for "this mal-adjustment by which art is divorced from life, and life from art." The better distribution of wealth, or of "work and idleness," will put an end to the exploitation of individuals in great gangs; "the workman will be able once more to see and shape what he is making;" in place, we presume is meant, of mechanically making a part of it only. It is perfectly true that the condition of labour hinted at—the prevalence of machine-made articles and machine-like labour, is one of the great hindrances in the way of industrial and decorative art; though unhappily we see little hope at present of any improvement in this respect. But this does not affect the fine or intellectual arts. A picture is still painted by one man and is the work of one brain; symphonies are written by one composer and are the offspring of one mind which sees and shapes the whole work; poems are not as yet produced by machinery. That consideration suggests the fallacy running through the whole article—the same fallacy which pervaded the teaching of William Morris—that art is the same thing as craftsmanship. In a healthy state of life all craftsmanship should be art; but all art is not craftsmanship. The "Fine Arts" still maintain their right to stand on a higher intellectual level.

The same number contains a thoughtful article by Professor Rawson on "The Nation, Apprentice, and Polytechnic." The main object of it is to show how tentative and partial are our efforts at technical education, and how limited is the use made of it, in comparison with that which is to be found in many Continental nations; and he urges that a higher objective should be given to technical education; not the mere learning of a craft, but the acquirement of general technical knowledge for its own sake, and as an important factor in the education of the mind. The article is worth serious attention.

The *Nineteenth Century* contains an able and most important article by Sir Herbert Maxwell on "The Sad Plight of British Forestry," a subject of national importance. Sir Herbert Maxwell goes very fully into the demonstration of our neglect of a great source of national wealth in not sufficiently attending to the cultivation of forest trees; and argues that much ground now devoted only to purposes of sport would be far more profitably occupied, to the nation in the end and to the private owner in the first instance, if allotted to the culture of forest trees. We have not space to follow out here the arguments and statistics given, but we consider the article to be perhaps the most important of any published this month, and one which ought to receive serious attention.

The *Century* contains an article by Mrs. Pennell on "Italy's Garden of Eden," which serves as a string on which to thread a host of small line sketches—some of them so small as almost to be called thumbnail sketches—by Mr. Pennell. It is a typical "popular" article, and one cannot say that either the pen or pencil portion of it is of any particular value. Mr. J. Mead Howells contributes an article on "A French Government School from the Inside"—an art "atelier" to wit; an article which, from the descriptions it gives of French student manners, and the treatment of newcomers in a studio, leaves one in doubt whether French art-students are more of lunatics or more of blackguards — at least unless Mr. Howells's description of them is very highly coloured.

Harper contains an article by Professor Flinders Petrie on "The Royal Tombs at Abydos," a short account of his recent discoveries, which has the additional interest of some illustrations of various articles of artistic character found in the tombs, including what the Professor calls "the oldest group of jewellery known in the world." The perfection of the soldering in the very ancient goldwork is commented on. "In no case can the joint be detected with a magnifier, either by colour or excess." The abundance of vases cut in hard stones is also remarkable. Some 500 different forms have been made out from the fragments remaining, and the materials include rock-crystal, obsidian, diorite, gneiss, syenite, granite, slate, marbles of different colours, &c. The importance of the discoveries, in the opinion of Professor Petrie, is that they give us the turning-point of Egyptian art, which till the time of King Zer was archaic and tentative, but during his reign of probably fifty-seven years became crystallised into the forms the character of which varied little for more than 4,000 years later. The same number contains some examples of new illustrations to "Alice in Wonderland," by Mr. Peter Newell, who expresses the highest appreciation of Tenniel's illustrations, but craves leave to try his own reading. His figures of Alice do not quite satisfy us—perhaps they are based on the American rather than on the English child; but in every other respect his illustrations are masterly in humour and in power of drawing.

Scribner devotes "The Field of Art" to a consideration of M. Bartholome's great sculptural work, the "Monument aux Morts," signed with the initials of Mr. Russell Sturgis, who, writing with great sympathy and admiration for the French sculptor's work, makes it the occasion to consider the question whether sculpture can rightly abandon the character of quietness and immobility. We hardly see that the question is specially raised by M. Bartholomé's alto-relief groups, which, though poignant in emotional expression, cannot be called violent or strained in action. The question of realism in the rendering of age and youth in the various contrasted figures, also touched upon, is undoubtedly suggested by this work; and it may perhaps be admitted that this realism is carried so far as to be rather a disturbing element in the work from a purely artistic point of view. It may be argued, however, that in such a work placed in such a position (in the centre of a cemetery) the moral or human element has more claim to prominence than in other cases. We admit, however, that to our mind the great beauty and impressiveness of the work lies in those two central figures entering the door of the tomb—a group which both in conception and design is one of the finest and most impressive things in modern art; and those are perfectly sculpturesque in style.

The *Pall Mall Magazine* contains an article by Mr. Marillier on the life and work of Lord Kelvin, with a portrait in which he is represented holding some of those molecular models to which we recently referred in a footnote to our *résumé* of the British Association meeting.

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The article is an exceedingly good and interesting account of some of Lord Kelvin's most prominent scientific inventions and what may be called his cosmical ideas and suggestions. It includes also a good anecdote; how Professor Joule came into the laboratory when Lord Kelvin was experimenting for the construction of his sounding apparatus. Joule, seeing large coils of pianoforte wire, and being told they were for sounding, asked absently "What note?" "O, the deep C," was the reply.

The *Idler* contains a short article on "What We Know About Mars," by Mr. E. S. Holden, formerly director of the Lick Observatory—a very salutary kind of article to have in a popular magazine, since it puts in a plain and comprehensible way a little of the real truth as to appearances on Mars, and the possibility (at our present telescopic distance) of drawing any positive inference from those appearances. It will be a disappointing article to the sentimentalists who think we have got so much information about "canals" in Mars and probable inhabitants of the planet, but it may tend to clear their heads a little.

In the *Revue Générale* M. Humbert concludes his spirited and thoughtful essay on "Plume et Pinceau," the comparison between the powers of verbal description and artistic representation. The interest of the article is rather in the direction of literary than of artistic criticism, but it should interest artists nevertheless.

The *Home Counties Magazine*, which has reached its third year, continues to be both a useful and interesting collection of information in regard to the history and objects of interest of the neighbourhood around London. In the present issue the "Notes on Church Plate" deals at some length with the subject of beadles' staves in the churches of the City and neighbourhood. Of the City examples a series of fifteen photographs are given, of which the most interesting in the matter of design is that of St. James, Garlickhythe, the head formed by an open ring which encircles the scallop shell of St. James, and is surmounted by a small figure of the saint. Among the other illustrations are a reproduction of an old woodcut of Pope's house at Binfield, and a view of the old Market Place, Brentford, which serves to explain the ill-odour in which Brentford was held in ancient times, as "a town of mud"; it certainly looks a pigstye of a place in the illustration.

We have received also the *Gentleman's Magazine*, *Knowledge*, and *Climate*.

LIVERPOOL ARCHITECTURAL SOCIETY:

THE CATHEDRAL SCHEME.

At the opening meeting of the session of the Liverpool Architectural Society on Monday last, the President, Professor Simpson, devoted the principal portion of his opening address to a criticism of the scheme for the proposed new cathedral for Liverpool. He commenced by referring to the decision of the Liverpool Cathedral Committee that the style of the new cathedral should be Gothic, and after tracing the history of the Gothic revival in England, he remarked that in the large workshops there was no longer the enthusiasm for Gothic work which prevailed twenty years ago, and which made the Gothic revival more real than many supposed. Of the men whose genius carried the revival to its height few survived, and to these might be added some of the younger men who had remained true to their masters' traditions, but without the slightest exaggeration it might be said that the greater number of architects now practising in England were seeking development in other directions than Gothic. What was Gothic? Unfortunately mediæval detail was still regarded by some, especially by those interested in but not practising architecture, as constituting the Gothic style. But this was the wrong way of looking at it. Construction, not detail, made a style. If the committee were willing to depart from the recognised forms of ornamentation, which hitherto had been more or less obligatory, and allow the architect who designed, and the other artists who assisted a free hand in plan, ordinance, and detail, then it was possible that a building could be produced suitable to modern requirements, and yet Gothic in the true sense of the word. But if, on the other hand, by Gothic the conventional was meant; if the term was to be narrowed to mean a reminiscence of mediæval buildings; if the plan, mouldings, carvings, and accessories were such as would conform to the standard of the amateur, whether ecclesiastical or lay, who took no interest in living architecture, but who found satisfaction in examining the work of the past, then there was every danger that the finest opportunity which had occurred since the time of Sir Christopher Wren was going to be thrown away. If the term Gothic was used in its narrow sense limitations would be placed on architects which workers in no other art would tolerate for a minute. Why they should always be the sufferers he failed to understand. They were daily told that other arts were advancing while theirs was standing still. He did not believe that. The advance in architecture was as great, if not greater, than that in any other art, but restrictions such as that proposed to be inflicted rendered advance doubly difficult. If the Emperor Justinian had commanded the architect of the new Santa Sophia to construct it in the Greek or in the Norman style the world would have been the poorer by one of its finest buldings. But the Emperor had too much good sense; he allowed the architect fair play and a free hand, and that was all they asked from the Liverpool Cathedral Committee at the beginning of this new century. If there was ever to be a new departure now was surely the time. Architecture more than any other art in existence suffered from a glorious past. What should be a source of strength to them was converted into a source of weakness. Nobody admired the old Gothic buildings more than he did. There was not a cathedral in England he had not visited, and he had seen most of the best on the Continent, but that did not make him regard their style as the one most suitable for a modern cathedral.

His objection was not so much to the decision that the style was to be Gothic as to the dictation that the style was to be anything at all. The citizens of Liverpool acted otherwise seventy years ago. If Elmes had been told he had to design in the Gothic style they would not have had in St. George's Hall one of the most remarkable buildings in the world. He would be told that that building was different; that it was not ecclesiastical. No more were the Houses of Parliament, built at exactly the same time; and yet that did not prevent the committee from issuing instructions to architects that the style of the building was to be Elizabethan or Gothic. Had they advanced nothing in seventy years? Was the method observed in London in the first year of Victoria's reign to form a precedent to be followed in Liverpool in the first year of Edward VII.? There was some excuse seventy years ago. The tide of the Gothic revival was flowing strongly, and men were full of enthusiasm for the new movement, but the tide had turned now, the old enthusiasm was dead, and a new movement on totally different lines had taken its place. It was unfair to ignore this fact. Cathedrals were not built every day. Another such opportunity might not occur throughout the century, and the narrowing of the instructions to architects would cut out many men accustomed to deal with big architectural problems, but whose sympathy with Gothic was but slight, because to them the style was inappropriate to the requirements of the day, and incapable of further development beyond the point reached 300 years ago. To turn to another point. Against the style dictated there were certain local objections. Liverpool had fine architectural traditions, but they were not Gothic. Its public buildings and many of the fine blocks of city offices erected before the middle of the last century were all Classic. So were the best recent buildings in the town. A Byzantine or Romanesque cathedral would harmonise with these surroundings because both styles were founded on Classic work. The site undoubtedly lent itself more to the squarer Classic or Byzantine than to the longer, thinner Gothic. He was not, however, protesting so much against the inclusion of the Gothic, although he regarded it as unsuitable, as the exclusion of the other styles. That the style should be left open was one of the points the Architectural Society emphasised in the meeting held between the Cathedral Committee and a deputation from the Council of the Society. They intimated to the committee their disapproval of a limited competition on the ground that, outside the very few really well-known church architects, it could not be said that there were many who possessed special claims to be regarded as experts in cathedral planning and design. Many men had recently built excellent churches, but a man who built a decent church might not be capable of dealing with the much bigger problem of a cathedral. Provided the committee did not wish to appoint direct one of the well-known men as architect, the Society suggested a competition open to all English architects, and that proper assessors should be appointed. They further suggested that at least six months be allowed for the preliminary competition, and twelve months for the final. None of these suggestions had found favour; in fact, he understood the committee had decided to dispense with assessors altogether, and make their own selections from portfolios and drawings submitted. If this were true it was opposed to the method under which all important competitions were now decided. Practical considerations were ignored by the restriction as to the style of the cathedral, and the only result would be to fetter the architect and all whom he called to assist him. This was to be the first cathedral of the new century. Was it to be merely the coping-stone of the style of the last century, or was it to be the foundation of the new? Here was a chance for an epoch-making building, for a second Santa Sophia, a second Amiens Cathedral. Was this chance going to be thrown away? The committee, he was sure, were animated by the same desire as all of them to see a building worthy of the city and worthy of the opportunity. But with all deference they were going the wrong way to obtain it. It was no offence to them to say that, not being architects, they were out of touch with the architectural movement of the day. They were clinging to a departing style. In an unrestricted competition it was possible that the best style sent in might be Gothic; if so, build it; but the decision of the committee prevented any attempt being made to show what was possible on other lines. The cathedral might take a quarter of a century to build, and at the end of that time if dry-as-dust design was now chosen, and the present architectural movement continued to grow as rapidly as it had done in the last ten or twelve years, it was probable that the first cathedral of the twentieth century, when finished, would be as obsolete in style as an old East Indiaman was now.

In the course of the discussion which followed, Mr. W. E. Willink said that it would have been very much better if the Society had never been invited to give their opinion at all, for it had been ignored, but the committee were under the delusion that they were meeting their views. A very large number of architects of repute, probably four-fifths, would be excluded from competing, because if they did compete they would be working in a style with which they were not well acquainted. The non-appointment of a professional assessor would ruin the competition, and the committee would find they had acted foolishly. That the committee excluded everything except what they crudely called Gothic was a calamity. In proposing a vote of thanks to Professor Simpson for his address, Mr. Willink added that it had been delivered on a melancholy occasion, for a great opportunity had been lost. Another member observed that it ought to be publicly known that the architects of Liverpool were practically unanimous in condemning the action of the Cathedral Committee.

METROPOLITAN ASYLUMS BOARD.

The ordinary meeting of this Board was held at the Board's offices, Victoria Embankment, on Saturday, Mr. Hensley presiding.

The Works Committee, reporting with regard to Joyce Green Hospital, recommended the acceptance of the tender of Messrs. Moorwood, Sons, & Co., Limited, of Sheffield, in 1,688*l.*, for fitting up the kitchen department in accordance with the plans and specifications prepared by the architects, Messrs. A. & C. Harston. The recommendation was adopted. The other tenders were:—J. & F. May, London, 1,877*l.*; Wenham & Waters, Croydon, 2,009*l.*; Benham & Sons, London, 2,067*l.*; W. Summerscales, Keighley, 2,145*l.*; Clements, Jeakes, & Co., London, 2,200*l.*; and R. & A. Main, London, 2,612*l.*

On the recommendation of the same Com-

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mittee instructions were given to Messrs Harston to proceed at once with the preparation of the land set apart for a cemetery at the Joyce Green Hospital, and with the fencing, formation of paths, and approach roads in connexion therewith.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the summer recess was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Battersea Borough Council 2,745*l.* for alterations to the Town Hall; the St. Pancras Borough Council 5,500*l.* for street improvements; the Wandsworth Borough Council 500*l.* for the purchase of dust vans; the Woolwich Borough Council 3,300*l.* for the purchase of land; the Islington Borough Council 3,244*l.* for contribution to street improvement; the Paddington Borough Council 15,000*l.* for paving works; the Hampstead Borough Council 9,525*l.* for electric lighting purposes, 19,525*l.* for electric light installation and meters, and 0,620*l.* for electric light purposes; the Kensington Borough Council 10,020*l.* for wood paving works; the Shoreditch Borough Council 2,040*l.* for provision of shelter; the Stepney Borough Council 10,000*l.* for electric light purposes; the Woolwich Borough Council 600*l.* for completion of underground conveniences; the Holborn Guardians 9,000*l.* for the erection of casual wards; the St. George-in-the-East Guardians 40,000*l.* for reconstruction of workhouse and erection of nurses' home; the Wandsworth and Clapham Guardians 1,010*l.* for additions to the infirmary; and the Woolwich Guardians 23,940*l.* for purchase of land and erection of cottage homes.

The Chairman's Annual Address.—The Chairman then delivered his annual address, in the course of which he said that the whole staff at the central offices now numbered 803, and there was a crying need for new offices. More than half the staff was housed away from the chief building, and in some cases in premises which were quite unfit to be used as offices. There was great loss of power owing to lack of proper concentration of departments. The present rents amounted to 15,460*l.*, as compared with 4,950*l.* in 1889. The present position demanded change, in the interest of health and efficient working, and as the need was urgent the remedy should be speedily undertaken. The cost would be large, but the time was already overdue when the largest municipal staff in the world should carry on its work in elevating surroundings.—During the year four important improvements were completed, including that of Highgate Archway, and considerable progress was made with the twenty-five schemes in course of execution. Of those, the most important, of course, were the Holborn to Strand scheme and the Westminster improvement. Some of the improvements now being undertaken were in districts rich in historical associations. Wherever possible, buildings of historical interest were preserved, but when it was absolutely necessary to demolish them, the greatest care was taken to preserve the most interesting portions. Moreover, during the work of excavation, vigilance was exercised to secure and preserve any objects of archæological interest which might be brought to the surface, a reward being offered to the finders thereof. In this work of preserving objects of interest the Improvements Committee have had considerable assistance from the Historical Records and Buildings Committee. The total gross expenditure of the Council in respect of the county improvements already sanctioned and now in hand, or about to be undertaken, was estimated at 11,065,207*l.*, while the net expenditure, after deducting recoupment, was estimated at 5,202,642*l.* The serious question, with all that vast projected outlay, was that of ways and means, as a marked increase in the rate must have a damaging effect on the Council's future. It seemed only reasonable that those who benefited by these improvements should make substantial contribution.—One of their most valuable acquisitions was that of the Archbishop's Park, Lambeth. The work of laying out had been commenced, and would be completed at a cost of 4,800*l.* Three entrances were to be formed, and the Ecclesiastical Commissioners had granted the Council, free of cost, the use for ninety-nine years of the necessary access. In 1889 the parks and open spaces numbered forty and cost 52,000*l.* for maintenance. Now there were ninety-two, and the cost was 113,210*l.* The acreage had increased in the same period from 2,656 to 3,833.—The Highways Committee had vast schemes in progress and under consideration. It aimed at revolution; it would not rest content until every district in London was properly served with tramways. It was convinced that horse traction was doomed, that electricity must be the future power, and that the conduit system must be adopted. He would give one illustration, of a personal character, showing how the individual was served who wished to travel in London. Returning last Saturday week from the ceremony of opening the new electric generating station at Lombard-road, Battersea, the following appeared to be the quickest route—a car from the station a certain distance, another to Chelsea Bridge, a 'bus to Victoria Station, train to Mansion House, 'bus to Broad-street, train to Mildmay Park, and then car to Highbury, or seven conveyances to go about nine miles. The working-men of London were handicapped by such a monstrous want of system more severely than in any other city. Surely that state of things needed alteration.—The Building Act Committee had held thirty-six meetings. During the year under review 7,389 new buildings were examined, for which fees amounting to nearly 21,000*l.* were received, being the greatest amount in fees received in one year since 1881; 2,966 cases of dangerous structures were dealt with, and 680 summonses were issued in consequence of the failure of owners to comply with the requirements of the Council. It had been necessary to take legal proceedings in a large number of cases, either to obtain authoritative decisions or to enforce compliance with the law. The London Government Act, 1899, considerably affected the old areas of the Local Authorities, and steps are being taken to render the areas of the districts of the District Surveyors as far as possible co-terminous with the boundaries of the metropolitan boroughs. In connexion with the naming of streets, 169 subsidiary and other names were abolished, and the numbers of 4,349 houses rearranged; ninety-nine names for new streets were approved, and 104 streets were ordered to be renamed and renumbered.

The Chairman was thanked for his address.

Buildings in Victoria-street.—The Building Act Committee recommended that the Council, in the exercise of its powers under Section 22 of the London Building Act, 1894, but in no way otherwise than under such Section, do consent to the erection of one-story shops and an entrance-porch in front of No. 125, Victoria-street, Westminster, to the line shown on the plan (signed by the Chairman of the Building Act Committee, and dated July 13, 1901), submitted with the further application of Messrs. Z. King & Son on behalf of Mrs. M. Hiscox, Mr. J. T. Hiscox, and Mr. R. T. Raikes.

The recommendation was referred back for further consideration and report.

Tramways.—The Highways Committee recommended as follows:—

"That the Highways Committee be authorised to conduct the negotiations, and the arbitration (if any), with reference to the purchase by the Council from the South London Tramways Company, of the tramways, works, and undertaking authorised by the South London Tramways (Extensions) Act, 1880.

That the Highways Committee be authorised to conduct the negotiations, and the arbitration (if any), with reference to the purchase by the Council, from the Woolwich and South-East London Tramways Company, of the tramways works and undertaking authorised by the Woolwich and Plumstead Tramways Order, 1880, and the Woolwich and South-East London Tramways Order, 1881, as confirmed by the Tramways Orders Confirmation (No. 2) Act, 1880, and the Tramways Orders Confirmation (No. 1) Act, 1881, respectively."

The recommendations were agreed to.

Breaking-up Roads.—Mr. John Burns, M.P., asked the Chairman of the Committee, Mr. Benn, whether he was prepared to take steps to prevent the breaking-up of roads by all sorts of companies. He also wanted to know whether the Committee would take steps to require that all these companies should do this work at the same time so that one breaking-up would do.

Mr. Benn explained that the London County Council was unfortunately deprived of its rights over the roads by the Borough Councils Act of 1899. All his Committee could do was to make representations to the Local Authorities.

Housing.—The Housing of the Working Classes Committee reported as follows:—

"On July 30, 1901, the Council voted a sum of 8,745*l.* for the erection of the first block of dwellings to be built on the Swan-lane site, Rotherhithe, and authorised us to invite tenders for the erection of the dwellings. At the same time the Council authorised our Chairman to open the tenders when received, and to accept the lowest satisfactory tender. The following tenders were accordingly received and opened by our Chairman—

	£		Alternative price with comb-graining of internal woodwork. £
Messrs. Holloway Bros.	8,051	...	8,122
Mr. B. E. Nightingale ...	8,222	...	8,277
Mr. R. L. Tonge	8,280	...	8,323
Messrs. Martin, Wells, & Co.	8,310	...	8,424
Messrs. Spencer, Santo, & Co.	8,406	...	8,480
Mr. H. M. Patrick.....	8,490	...	8,574
Messrs. Herbert Bros ...	8,773	...	8,864
Messrs. Tod & Newman	8,913	...	8,998
Messrs. Sabey & Son ...	9,418	...	9,536
Messrs. D. Gibb & Co....	9,745	...	9,821
Messrs. J. Smith & Sons, Limited	10,954	...	11,108
Messrs. Hobbs Bros. ...	12,085	...	12,258

The architect's estimate for the dwellings (including comb-graining of internal woodwork) amounted to 8,145*l.* Acting, therefore, on the authority referred to above, our Chairman accepted the tender of Messrs. Holloway Bros. of 8,122*l.* The contract was sealed on September 11, 1901, and the work is now in hand.

The following tenders were received and opened by the Council on July 30, 1901, for the construction of the first part of the roads and sewers on Section A of the Totterdown-fields estate:—

	£	s.	d.
Mr. F. J. Coxhead	7,369	0	0
Mr. George Wilson	7,525	11	7
Messrs. C. W. Killingback & Co.	7,791	5	4
Messrs. Lawrence & Thacker ...	7,932	15	9
Mr. Samuel Redhouse	8,118	0	0
Messrs. John Mowlem & Co.	8,658	14	7
Mr. Stephen Kavanagh	8,749	5	7
Messrs. William Neave & Son ...	9,722	11	7
Messrs. E. Rogers & Co.	9,800	19	4
Messrs. Meston & Hale	12,945	19	1
Mr. James Dickson	13,763	6	4

On July 30, 1901, the Council sanctioned an expenditure of 7,725*l.* to cover the cost of the work, and of this sum 7,275*l.* represented the amount which could be spent on the contract itself. On the same date the Council authorised our Chairman to accept the lowest satisfactory tender within the amount sanctioned. The lowest tender received exceeded this amount by 94*l.*, and, acting on the authority referred to above, our Chairman reduced the amount of the provisional sum of 500*l.* for contingencies included in the tender of Mr. Coxhead by 100*l.*, and thus brought it within the limit imposed by the Council. The result of inquiries as to Mr. Coxhead's position and competence to carry out the work having proved satisfactory, our Chairman then accepted his tender for the revised amount of 7,269*l.* The work was at once put in hand, and is now well on the way to completion."

The Council, having transacted other business, adjourned.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting held at the Royal United Service Institution on Monday evening, the 7th inst., Mr. Charles Mason, President, in the chair, a paper was read on "Preliminary Investigations for Water Supply," by Mr. Sydney A. Hollis. The author first pointed out the difficulties which were encountered by engineers in tropical and subtropical countries in the gaugings of rainfall and rivers. Some statistics of remarkable and erratic rainfalls in the Cape Peninsula were given. The author then gave a detailed account of the gaugings carried out by him at Steenbrass River, Cape Colony. He stated that the gaugings were taken with a view to the ultimate formation of a large storage reservoir by means of a dam across the mouth of the valley, the object being to obtain a supply of water for some of the suburbs of Cape Town. A large gauge weir was erected measuring 60 ft. across, and it was found that the flow of water in the river fluctuated between half a million gallons and 300 million gallons in the twenty-four hours. A description was given of the river gauges constructed to measure the flow of water in winter and summer, with particulars of the number and position of the rain and evapora-

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tion gauges. A paper was also read on "Irrigation Works in South Africa," by Mr. J. Freebairn Stow. The author first referred to the Report of the Royal Commission on the settlement of time-expired soldiers and others in South Africa on the conclusion of the war, and pointed out that the Commissioners were strongly impressed with the value of irrigation works being undertaken in order to convert the vast area of dry veldt into an agricultural site, capable of providing produce for intending settlers. The author then drew attention to the persistent attempts made in 1886 by the late Mr. H. S. Orpen, at that time Surveyor-General of Griqualand West, to induce the Government of the day to take up the subject of irrigation works. The author then described the first scheme of irrigation ever attempted in South Africa on a large scale, and referred to the failure which attended the project. He then gave an account of the scheme prepared by Mr. Litchfield for irrigating the veldt in the vicinity of Douglas, and described the ingenious and somewhat rough-and-ready means adopted for the construction of the masonry dam across the Vaal River, and the engineering difficulties encountered. The use of explosives in the blasting operations, necessitated by heavy rock cuttings, and the methods adopted for crossing the valleys and running the canal round the kopjes, were described, and the difficulty of ensuring a safe passage across or under the irrigation canal for storm-water from off the numerous kopjes was also discussed. The manner in which the last sections of the masonry dam were built in was described, and the author gave examples of the way in which engineering work in a rough country was carried on, and how plant and material were transported where railways were unknown. In conclusion, he referred to the favourable attitude of the Government of Cape Colony in respect of irrigation works.

Illustrations.

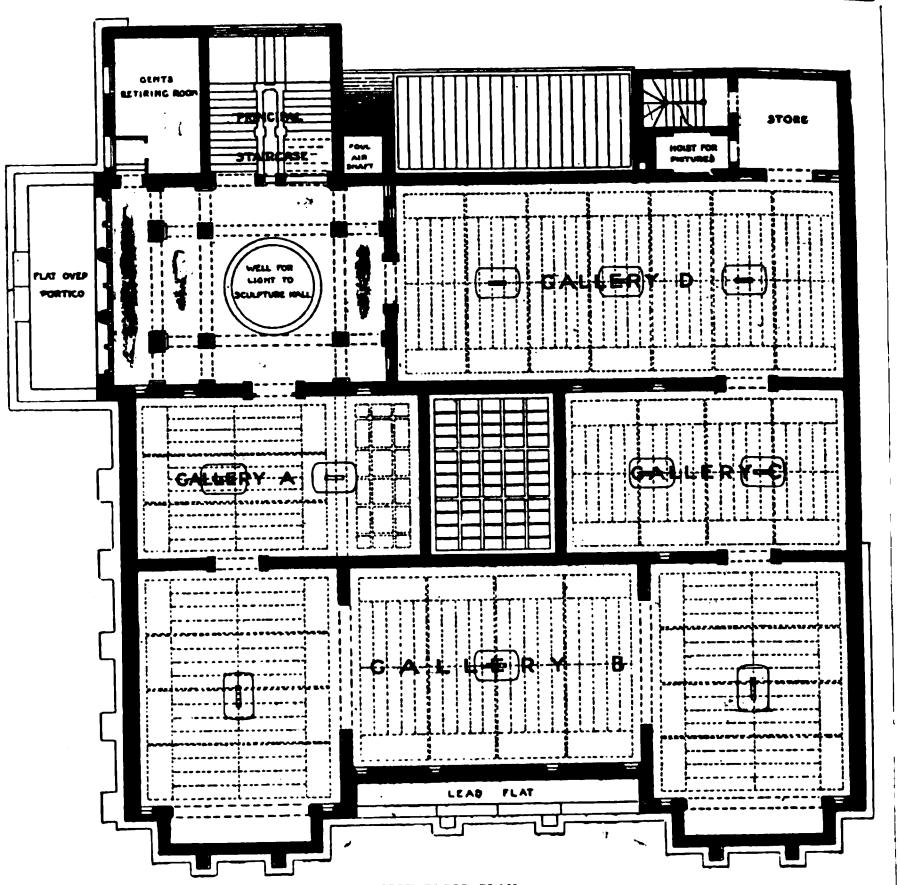
BURY ART GALLERY AND PUBLIC LIBRARY.

THIS building is situated at the corner of Moss-lane and Silver-street, and has a frontage to Moss-lane of 110 ft. and to Silver-street of 105 ft.

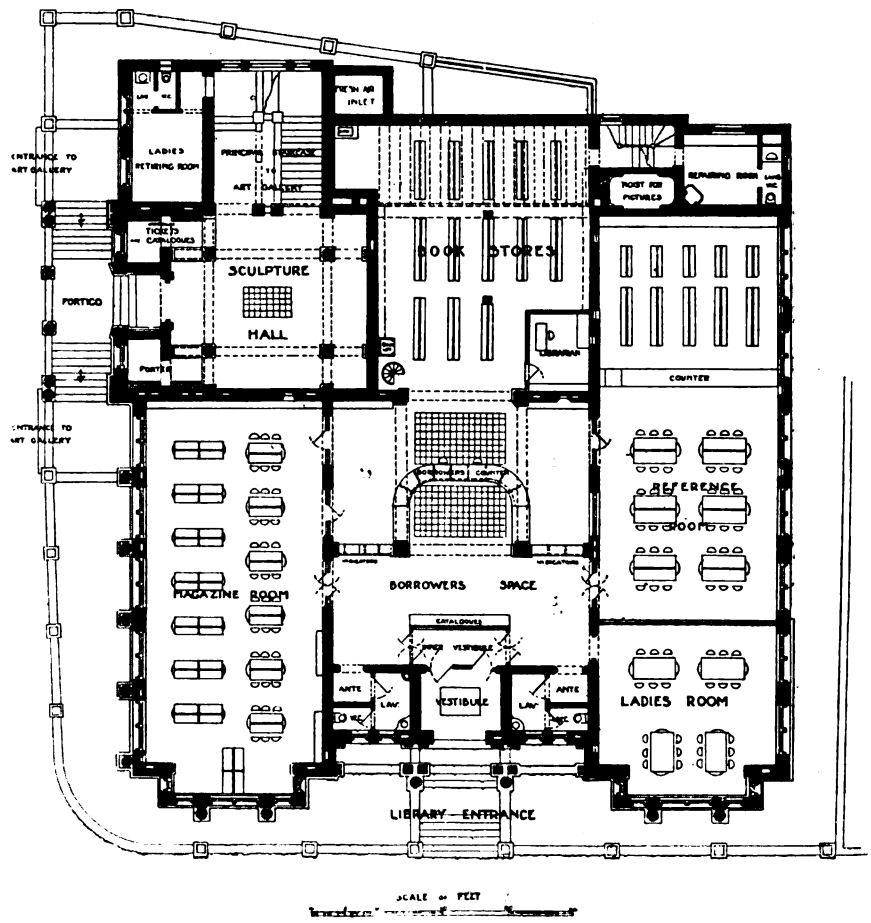
The structure comprises three complete stories—basement, ground, and first floors—with a sub-basement under the rear for the heating and ventilating plant. The first floor is entirely devoted to art, and is entered from a sculpture hall on the ground floor by a spacious stone staircase. There are five galleries arranged in sequence, the sizes varying from 27 ft. by 33 ft. to 27 ft. by 61 ft. Provision is made for ladies' and gentlemen's cloak-rooms, lavatories, &c., and at the back of the building there are rooms for repairing, &c. A large hoist connects the loading way with all the floors.

The ground floor has been devoted to library purposes, and will be entered by a vestibule 12 ft. wide. This vestibule opens direct into the borrowers' space, which is 40 ft. wide. To the right of the borrowers' space swing doors open into the ladies' and reference rooms, and to the left admission to the magazine and reading-rooms is gained in a similar manner. Separate conveniences are provided on each side of the entrance, and are entered from the borrowers' space through ante-rooms. A librarian's room and a large book store are arranged in conjunction with the borrowers' space. The basement is chiefly devoted to stores under the library, and connected therewith by a spiral staircase is a large book store. At the rear of the building a loading way for receiving books, pictures, &c., hoist, and packing-room are provided on this floor. The remainder is occupied by store-rooms for packing-cases, &c.

The main elevations are faced with boasted ashlar obtained from the Higher Stancliffe Quarries, Darley Dale, Derbyshire, the remaining elevations being faced with Edwards' Ruabon best selected red bricks. The joiner's work generally is Kauri pine stained. The gallery floors are laid with oak parquetry, the library with oak blocks, and the reading-rooms with pitch-pine blocks. The vestibules and halls have mosaic floors, and the steps, landings, &c., for the staircases are blue Shepley with Bath stone balusters and handrail.



FIRST FLOOR PLAN.



GROUND PLAN.

Bury Municipal Art Gallery. Plans.

The building is heated and ventilated on the "Plenum" system, is of fireproof construction throughout, and is lighted by electricity. Messrs. Thompson & Brierley, of Bury, have carried out the general contract, their tender being 21,259*l*. The clerk of works was Mr. G. E. Smirk, of Bury.

The following special tradesmen have also been employed on the work:—Messrs. Sutcliffe & Co., Manchester—heating and ventilating; The Banks Fireproof Construction Syndicate, London—fireproof construction; Mr. J. F. Ebner, London—art gallery floors; Messrs. C. W. Williams & Co., Manchester—mosaic; Mr. J. J. Millson, Manchester—carving and sculpture work; Messrs. W. J. Pearce & Co., Manchester—leaded lights; Messrs. Heywood & Co., Huddersfield—patent glazing; Messrs. Marley Bros., Birmingham—fire extinguishing apparatus; Messrs. Hardman,

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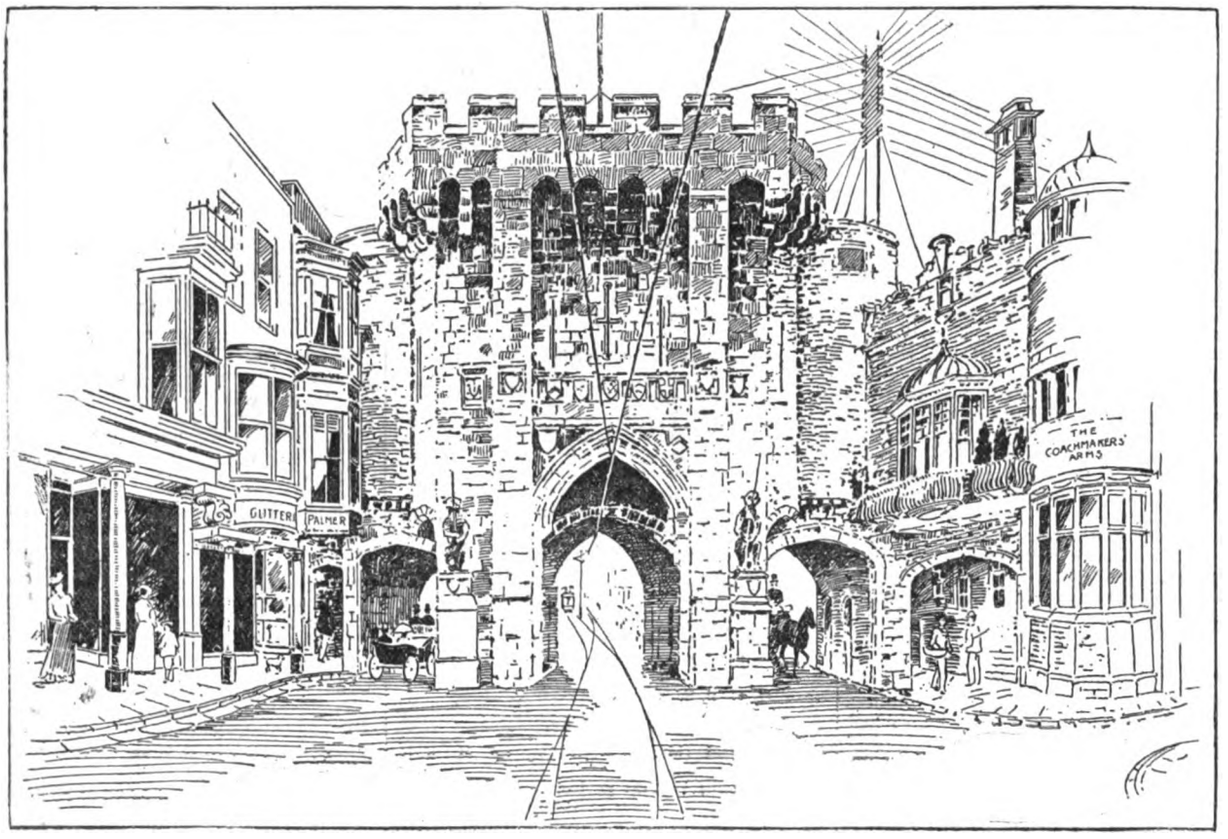

The Bar-Gate, Southampton, as it would appear after the Alterations proposed in Mr. Lucas's Scheme.

Powell, & Co., Birmingham—wrought-iron gates; Mr. Burgoine, Bury—hoist; Mr. George Wragge, Salford—protection rails, brackets, &c.; and Messrs. Singer & Co., Frome—electric light fittings.

The furniture and fittings have been executed in Dantzic oak by Messrs. Goodall, Lamb, & Heighway, Manchester, and the building has been painted and decorated by Mr. George Smith, of Bury.

The whole of the work, including the fittings, has been designed and supervised by the architects, Messrs. Woodhouse & Willoughby, of Manchester.

HOUSE, ASCOT HEATH.

This house, which is being erected on the north side of the heath, is constructed of two kinds of local brick, the quoins, &c., being red and the filling-in of a "grey" colour, and the roof is covered with tiles. Mr. Wm. Watson, of Ascot, is the builder, his contract being about 3,000*l.*, and the architect is Mr. Leonard Stokes, of Westminster.

SCHEME FOR DEALING WITH THE BAR-GATE, SOUTHAMPTON.

As many of our readers will probably have heard, there has been a foolish agitation going on at Southampton in favour of doing away with the old Bar-Gate, one of the most interesting ancient monuments in Southampton, on the usual plea of public improvement. A Southampton architect, Mr. Lucas, has drawn up the scheme illustrated in our plate (from a drawing exhibited at the last Royal Academy) for altering the roadways so that the obstruction to traffic may be removed without injuring the structure.

Mr. Lucas's aim is to preserve permanently the original function of the building as the town's chief gateway, while, nevertheless, increasing the traffic facilities of the street. It is proposed to do this by widening the two side passages for the use of carriage traffic, and by forming two new passages for pedestrians under the adjoining business premises. The side passages, made towards the end of the eighteenth century, have no historical value whatever, and the enlargement of their southern entrances would be a distinct gain to that face of the Bar-Gate, as, by being the same height and only about two-thirds the width, they clash with the central opening, making it appear stunted while they look stilted. Their arches, too, are of a different type to the older one, and they are awkwardly out of centre with the windows over.

The alteration on the north side is so slight that many people have with good excuse taken the sketch which we print in the text to represent the gate as they know it. We understand that if other considerations readily permitted, Mr. Lucas would have preferred to design the northern entrances of the carriage-ways somewhat farther to the east and west so as to clear the two turrets and allow of building up under them from the ground. It is doubtful, however, whether the arrangement shown is not more picturesque though less constructional; and it is certain that the curving of the passages would be a great inconvenience.

The scheme only involves one complete rebuilding, that of the public-house at the north-west corner, the other premises affected having their lower stories set back and the upper ones carried on columns. The covered walks thus formed would be a boon to those who have shopping to do in wet weather. These walks are on the plans called "piazzas," for want, possibly, of an English name that would be as suitable and concise. A piazza, however, is not necessarily a covered place; but there are also objections to the words "colonnade" and "penthouse."

The plan shows the extreme narrowness of the street independent of the Bar-Gate, so that even from a wholly utilitarian point of view its removal would be absurd. Mr. Lucas's plan trebles the effective width of the road, and divides the wheeled traffic into two streams, one going up and one down. It increases also the wayleave for pedestrians, and provides better access to the large hall over the gateway, now used as the Guildhall, by a new doorway and a partly new flight of steps at the east end, and by an entirely new staircase at the west.

"PRIX DE ROME" DESIGNS.

We give on one plate reproductions of the works in architecture, painting, and sculpture which gained the "Prix de Rome" at the last competition for it at the Ecole des Beaux-Arts, Paris.

The subject for the prize in architecture, gained by M. Jean Hulot, was "An Establishment for Artistic, Literary, and Scientific Studies, founded at Paris by the United States of America." Except in the presence of the eagle as an acroterion to the dome, there is nothing specially to connect the design with the United States, unless we take the view that as American architects have closely imitated French methods, the more French, and the more "Ecole des Beaux-Arts," the design appears, the more American it is. The smaller elevation is apparently intended to show the proposed site and grouping.

The subject for the prize in painting, gained by M. Jacques Defrance, is "Christ Healing the Sick at Evening before the Gate of a Town."

The subject for the sculpture prize, awarded to M. Bouchard, is "Œdipus and his daughter Antigone driven from Thebes."

The winning of the Prix de Rome, as our readers are probably aware, entitles the young artist to four years' sojourn and study in Rome, at the expense of the State.

THE TRIBUNAL OF APPEAL:

THE LAYING OUT OF NEW STREETS.

The Tribunal of Appeal under the London Building Act, 1894, met at the Surveyors' Institution, Great George-street, Westminster, on 27th ult., to hear an appeal by Mr. Walter H. Dawson as agent for and on behalf of Mr. Henry W. Forster, M.P., against the order of the London County Council refusing to sanction the formation or laying out of new streets for carriage traffic on part of the Forster Estate, on the east side of Bromley-road, Catford, at the corner of Sangley-lane. The members of the Tribunal present were Messrs. J. W. Penfold (chairman), A. H. Hudson, and E. A. Gruning.

The appellant's case was conducted by Mr. Guy Lushington, barrister; while Mr. J. W. Andrews, from the Solicitor's department of the London County Council, appeared in opposition to the appeal.

Mr. Lushington said the appeal was brought under Sections 9 and 19 of the Act, the Council having refused to pass plans for the creation of new streets on an estate which was now in process of development. Their ground for this refusal was set down as due to the proposed road not communicating conveniently with existing streets. The Council had the right to use their discretion in this matter, subject, of course, to an appeal to that Tribunal; hence, he had all the more confidence in ap-

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pearing before them. The real reason of the Council's refusal was, he contended, due to the fact that the four projected streets did not, according to the view of the County Council, communicate with the streets of the adjoining estate, which was being developed by Mr. Cameron Corbett, M.P. The Tribunal had, he submitted, to be guided by the law, and not by the opinion of a man or a body of men. As a matter of fact, the streets proposed to be laid out by the appellant would communicate with two existing streets, and he argued that it was not the duty of the public authority to cast its eyes around an increasing neighbourhood to see whether the plans would suit the circumstances of an adjoining estate not developed. The law, on the contrary, provided only that proposed new streets should communicate in a reasonable manner with other streets already in existence, and not with adjoining estates. The Lewisham Borough Council had signified that it considered the scheme unobjectionable.

Mr. Dawson, agent to the appellant, gave evidence in support of the appeal.

Mr. Andrews, for the respondents, mentioned that there was already before the Council an application in connexion with the roads of the adjoining Corbett Estate, and in the course it had taken the Council was acting bonâ-fide in the interest of the public. Indeed, it was the intention of Parliament to cast upon the Council the responsibility of watching the interests not of individual owners, but of the public as a whole, and to insist that a man should not lay out his estate without regard to the public convenience. In this case it was the opinion of the advisers of the Council that the proposed roads did not offer ready means of access into Bromley-road, and that, having regard to the certainty that roads would shortly be constructed on the adjoining Corbett Estate, the proposed streets should be planned in such a manner that they would readily communicate with the others. His contention was that there should be a well-considered scheme, designed in the public interest, for the development of the estate, having regard to the development which was to proceed on the adjoining estate. In this connexion he mentioned the possibility of an appeal coming before the Tribunal from the owner of the adjoining estate, and he suggested an adjournment of the present appeal until that had been dealt with.

The only witness called for the respondents was an assistant in the Superintendent Architect's department of the London County Council. He pointed out that the chief road sketched in the appellant's plans was not direct, and that if the application were sanctioned there could be no direct means of access between the Forster and the Corbett Estates. This would be very inconvenient for future residents, particularly in regard to access to the two nearest stations—Hither Green and Bellingham.

Mr. Andrews contended that this alone was a great consideration.

Mr. Hudson : But the Council has no right to put on the screw at the expense of an individual owner.

Mr. Andrews : The Council considers the claims of rich and poor alike ; it represents London as a whole.

The Chairman said the Tribunal was unanimously of opinion that the appeal should be allowed, but they added a stipulation that the proposed roads should be constructed within three years.

Some discussion ensued on the question of costs.

Mr. Andrews contended that it would be scarcely just to condemn the Council for a decision arrived at bonâ-fide as a part of its duty to the public.

Mr. Lushington argued that a principle was involved, and that the appellant was entitled to be reimbursed the costs to which he had been put in upholding it.

Negotiations between Mr. Lushington and Mr. Andrews with a view to an agreed sum having proved abortive, the Tribunal certified for 25*l.* costs.

Reredos, St. Michael's Church, Edinburgh. —A reredos has recently been erected in the Lady Chapel of St. Michael's Church, Hill-square, Edinburgh. When complete the niches will contain groups of figures. The carving was carried out from designs by Mr. Hamilton More Nisbett, architect, by Mr. John Gibson, Haymarket ; and the painting and colour decoration were done by Messrs. G. & H. Potts, Edinburgh. The cost of the erection was 145*l.*

APPLICATIONS UNDER THE 1894 BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications under the 1894 Building Act were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Means of Escape in Case of Fire.

Holborn.—Means of escape in case of fire proposed to be provided on the fifth and sixth floors of the Kingsley Hotel, Hart-street, Bloomsbury (the upper surfaces of which floors are above 60 ft. from the street level) for the persons dwelling or employed therein (Mr. C. F. Doll for Mr. J. Truslove). —Consent.

Lines of Frontage and Projections.

Wandsworth.†—Five shops, with a screen wall and storerooms over, on the south side of Lower Richmond-road, Putney, westward of Martyn's Waterman's School (Mr. F. A. Powell for Mr. A. C. Ballard).—Consent.

Bethnal Green, North-East.†—One-story shops on the forecourts of Nos. 32 and 34, Teesdale-street, Hackney-road, Bethnal Green (Mr. C. A. Legg for Mr. J Mendes).—Consent.

Brixton.†—A building, to be used as a furniture depository, on the south side of Brighton-terrace, Brixton-road, Brixton, on the site of Musley House (Mr. J. W. Chapman for the Bon Marché, Limited). —Consent.

Hackney, North.—Houses, with bay windows, on the east side of Mount Pleasant-lane, Upper Clapton, between Baker's-hill and No. 121, Mount Pleasant-lane (Mr. G. R. Woodruff).—Consent.

Hackney, South.†—A two-story building on the east side of Durrington-road, Clapton, to abut upon Ashenden-road (Mr. H. M. Wakley for Mr. R. H. Barnes).—Consent.

Hammersmith.†—Two projecting buttresses and two projecting doorways at the People's Hall, on the west side of Latimer-road, Hammersmith, northward of Olaf-street (Messrs. Fleetwood, Son, & Eversden for Mr. W. H. Winterbotham).—Consent.

Greenwich.†—One-story shops in front of thirteen proposed houses on the north side of Woolwich-road, Greenwich, between Nos. 461 and 401 (Mr. T. N. Dinwiddy for Mr. T. Dinwiddy) —Consent.

Kensington, South.†—That the application of Mr. W. G. Hunt for an extension of the period within which the erection of buildings on the east side of Addison-road, Kensington, at the corner of Oakwood-court, was required to be completed, be granted.—Agreed.

Lewisham.†—That the application of Mr. J. W. Brooker for an extension of the period within which the erection of six houses on the east side of Brockley Rise, Lewisham, at the corner of Brockley Park, was required to be commenced, be granted.—Agreed.

Lewisham.†—A wood, iron, and slate porch at the entrance to No. 59, Longton-grove, Sydenham (Mr. J. M. Stewart for Messrs. Stone, Simpson, & Mason). —Consent.

Lewisham.†—Retention of two, and the erection of eleven, dwelling-houses on the south side of Brownhill-road, Catford (Mr. H. G. Rodda for Mr. Durrant) —Consent.

Marylebone, West.†—Porch on the north side of No. 33, Montagu-square, St. Marylebone, to abut upon Montagu-place (Mr. F. W. Foster).—Consent.

Peckham.†—One-story shops on part of the forecourts of Nos. 136, 138, and 140, Kimberley-road, Nunhead (Mr. J. W. Watkin).—Consent.

Wandsworth.†—A two-story addition in front of No. 35, Jew's-row, Wandsworth (Mr. A. E. Nightingale for Mr. F. H. Bartle).—Consent.

Woolwich.—An open wooden porch in front of No. 32, West Chislehurst Park, Eltham (Mr. G. Hubbard) —Consent.

Woolwich.—One-story shops on part of the forecourts of Nos. 43, 44, and 45, Plumstead-road, Woolwich (Messrs. Church, Quick, & Whincop for Mr. P. J. Gibbons, Mr. H. A. Back, Mr. W. A. Peckett, and Mr. B. H. de Bartodano).—Consent.

Holborn †—An iron and glass enclosure over the sunk area in front of No. 27, Red Lion-square, Holborn (Messrs. Lander, Bedells, & Crompton for Mr. E. Marshall).—Refused.

Marylebone, East.—Buildings on the west side of Albert-road, Regent's Park, at the corner of High-street, on the site of Portland-terrace (Mr. F. J. Stevenson for Lord Howard de Walden).—Refused.

Westminster.—Three three-story bay windows and two porches to two blocks of residential flats, proposed to be erected on the south-west side of Emery Hill-street, Westminster, northward of Coburg-row (Mr. E. J. Stubbs for Messrs. J. Allen & Sons, Limited).—Refused.

St. George, Hanover-square —A warehouse building on the site of Nos. 199 to 203, Buckingham Palace-road, Pimlico (Mr. W. A. Large for Messrs. Humphreys, Limited).—Refused.

St. George-in-the-East.—The rentention of a wooden bay window or shopfront in front of No. 342, Commercial-road, St. George-in-the-East (Dr. W. J. Harding).—Refused.

St. Pancras, East.—Buildings on the site of Nos. 152 to 170, Euston-road, St. Pancras (Mr. M. C Meaby for the Hearts of Oak Benefit Society).—Refused.

Strand.—A projecting wood and iron sign in front of No. 38, Old Compton-street, Soho (Mr. H. Frith). —Refused.

Strand.—The retention of a projecting illuminated sign in front of the Lyric Theatre, Shaftesbury-avenue, St. James's (Mr. J. G. Buckle for Mr. T. B. Davis).—Refused.

Wandsworth —An estate office on the south side of Replingham-road, Southfields, at the corner of Wimbledon Park-road (Mr. D. Matthews).—Refused.

Woolwich.—The re-building to an increased height of the back additions of No. 2, High-street, Plumstead, to abut upon Griffin-road (Mr. C. Kitley for Mr. A. Chapman).—Refused.

Width of Way.

Westminster.—Two one-story office buildings on the east side of Palmer-street, York-street, Westminster, northward of the Metropolitan District Railway, with the external walls of such buildings at less than the prescribed distance from the centre of Palmer-street (Messrs. Barlow & Roberts).—Consent.

Fulham.—A one-story building to be used as a billiard-room at the rear of the Three Kings public-house, North End-road, Fulham, with the external walls of such building at less than the prescribed distance from the centre of Conan-street (Messrs. Richardson & White for Mr. R. Wash).—Consent.

Kennington.—A building to be used as a staircase, at Cumberland Works, Wigton-place, Milverton-street, Kennington, with the external walls of such buildings at less than the prescribed distance from the centre of Wigton-place (Mr. A. Parnacott for Messrs. T. & W. Judge).—Consent.

Hammersmith.—A block of flats on the west side of Queen-street, Hammersmith, at the corner of Sussex-place (Mr. H. G. Brace for Mr. E. Messiter). —Refused.

Width of Way and Lines of Frontage.

Finsbury, Central.—An iron and glass porch at the entrance to St. Philip's Vicarage, Holford-square, Pentonville (the Rev. T. C. Elsdon).—Consent.

Hackney, North.†—A block of dwellings on the north side of Stamford-terrace, Stamford Hill, Hackney (Mr. C. G. Smith for Messrs. Michell, Goodman, Young, & Co., Limited).—Consent.

Lewisham.—Five houses, with bay-windows, on the south-east side of Dartmouth-road, Forest Hill (Mr. R. C. Murray for Mr. W. A. Owston) — Refused.

Lines of Frontage and Space at Rear.

Strand.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed rebuilding of No. 55, St. James's-street, Piccadilly, at the corner of Bennett-street (Messrs. Newman & Newman for the American Dental Institute).—Refused.

Wandsworth.—A dwelling-house on the south side of Ormerley-road, Balham, to abut upon Laitwood-road (Mr. W. E. Johnson for Mr. G. E. Treves).—Refused.

Lines of Frontage and Construction.

Lewisham.†—The retention of a wood and glass showcase on the forecourt of No. 31, Brownhill-road, Catford (Messrs. A. T. and E. J. Bateman).—Refused.

Deptford.—Two houses at the rear of 45, 47, and 49, Kender-street, New Cross, and the rebuilding of two houses on the east side of Kender-street, southward of No. 49, with the external walls of the houses at less than the prescribed distance from the centre of a passage-way leading to Esther-cottages (Mr. J. H. Waterworth for Mr. W. Falkner).—Refused.

Westminster (detached).—A building, to be used as a church, on the north side of Prince Consort-road, South Kensington, with the external walls of such building at less than the prescribed distance from the centre of Jays-mews (Mr. G. F. Bodley for the Rev. H. B. Coward).—Refused.

Space at Rear.

Hackney, South.—Two-story workshop building at the rear of George House, Gainsborough-road, Hackney Wick, with an irregular open space at the rear (Mr. H. Gaye for Miss G. M. Bevan).—Consent.

Holborn.—A block of residential flats on the site of Nos. 47, 48, and 49, Hunter-street, and No. 9, Handel-street, Brunswick-square, St. Pancras (Mr. J. Davis for Messrs. Brown Brothers).—Refused.

Formation of Streets.

Lewisham.—That an order be issued to Mr. G. F. Logsdail refusing to sanction the formation or laying out of new streets for carriage traffic on the St. German's estate, Hither Green, to lead out of Torridon-road and Killearn-road (for Mr. A. Cameron Corbett, M.P.).—Agreed.

Wandsworth.—That an order be issued to Mr. J. M. Jones refusing to sanction the formation or laying out of a new street for carriage traffic to lead out of the east side of Wimbledon Park-road, Wandsworth, northward of Replingham-road (for the Lands Development Syndicate).—Agreed.

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Buildings for the Supply of Electricity.

Bermondsey.—A deviation from the plans approved for the erection of a generating station and works on the west side of Neckinger, Spa-road, Bermondsey, so far as relates to an alteration in the height of the battery-room and the erection of an additional story on the one-story men's room and lavatory to the southward of the battery-room (Messrs. Kincaid, Waller, & Manville, for the Council of the Metropolitan Borough of Bermondsey).—Consent.

Height of Buildings.

Islington, West.—That the application of Mr. F. Matcham for an extension of the periods within which the erection of a theatre building on the south side of Holloway-road, Islington, to exceed in height the width of a proposed new street to lead from Holloway-road to Warlters-road was required to be commenced and completed, be granted.—Agreed.

Dwelling-houses on Low-lying Land.

Woolwich.—That the solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Messrs. J. & C. E. Pearson, for the erection of a public-house with a cellar beneath, on low-lying land at the corner of Bostall-lane and Abbey-wood-road (Mr. J. O. Cook).—Agreed.

The recommendations marked † are contrary to the views of the Local Authorities.

GIGGLESWICK SCHOOL CHAPEL.

THE new chapel at Giggleswick School in Yorkshire, built from the designs of Mr. T. G. Jackson, R.A., the exterior of which was illustrated in our issue of September 10, 1898, was opened last week, when there was a large gathering of visitors to a special service and a lunch afterwards, followed by an organ recital in the chapel in the afternoon.

The chapel stands in an isolated position on the crown of a hill, and by the wish of the donor, Mr. Morrison, the principal feature in it was to be a dome, though the architect has partially assimilated this feature to the Gothic style of the remainder of the building, by designing the dome as an octagon on plan, which of course removes it from the category of domes in a constructional sense, though the architectural impression, in a distant view at all events, is retained.

We take the following information in regard to the building from the illustrated booklet which was issued in connexion with the occasion. The walls of the chapel are fitted into the naked rock which comes to the surface of the hill, the inclined planes of the stratification forming fine lines in the configuration of the site. Advantage has been taken of these in placing the chapel and forming the approaches, so that the natural and artificial lines should compose harmoniously and help one another.

It was the wish of the donor that the building should be finished and furnished in every respect from the beginning, leaving no room for subsequent intrusion of possibly unsympathetic work; and thus the chapel affords a rare instance of a building in which every detail, not only of construction but of decoration and furniture, has been completed at once, and designed by the same hand or under the same direction.

The dome is constructed on a novel method, with interlocking blocks of terra-cotta, invented and made by Mr. Pulham, with a backing of concrete. With these blocks and some additional contrivance it was found possible to build the dome without centering.

The outside of the dome is of timber covered with copper; the four main roofs are laid with cast lead; and the aisles and antechapel are covered with green Elterwater slates.

The walls are of millstone grit, quarried on the spot, faced externally with yellow Idle sandstone up to the plinth, and above it with Mr. H. R. Simpson's red Lazonby stone, intermixed with bands and chequers of sandstone and black limestone from Mr. Delany's quarry at Horton. The wrought masonry outside, including the window traceries, is of Messrs. Obank's Lees-moor sandstone. The interior dressings are of Ancaster Oolite, from Messrs. Lindley's quarries, banded with red Egremont sandstone, supplied by Mr. James Smith. The mortar in the foundations is made with Portland cement, and above with Messrs. Nelson's selenitic lime, which is also used for the plastering.

Advantage is taken of the fall of the ground to form a vestry under the east end, which communicates with the chapel above by a stair in one of the turrets.

The dome and four pendentives are lined with glass mosaic on an arrangement and scheme of colour devised by the architect, the cartoons being drawn by Mr. George Murray, a student and medallist of the Royal Academy, and executed by Messrs. Powell, of Whitefriars. Their foreman, Mr. Gregory, and the workmen under him, had previously carried out the mosaic decoration from Sir W. B. Richmond's designs at St. Paul's Cathedral. A semi-dome model showing the design was exhibited in the architectural room at the last Royal Academy, when we drew attention to it. We presume the archaic character of the design satisfies the architect and the donor; we should have preferred to see something a little more modern in spirit as the decoration of a chapel for a modern school. The mosaic, like that of St. Paul's, was worked from the face and *in situ*. Round the base of the dome in letters of mosaic is the text:—

MEMENTO CREATORIS TVI IN DIEBVS IVVENTVTIS TVAE ANTEQVAM VENIAT TEMPVS AFFLICTIONIS.

The scheme of decoration is continued beyond the limits of the mosaic by "sgraffito" in the four vaults which support the drum of the dome, and in the nave ceiling. In each of these vaults the design consists of a circle in the crown of the arch bearing a sacred monogram, and scrolls of vines and grapes, with labels regularly spaced and bearing the following texts:—

In the eastern arch—

EGO SVM RESVRRECTIO ET VITA QVI CREDIT IN ME ETIAM SI MORTVVS FVERIT VIVET

ET OMNIS QVI VIVIT ET CREDIT IN ME NON MORIETVR IN AETERNVM

In the southern arch—

EGO SVM VIA ET VERITAS ET VITA NEMO VENIT AD PATREM NISI PER ME

I H S

NON RELINQVAM VOS ORPHANOS VENIAM AD VOS QVIA EGO VIVO ET VOS VIVETIS

In the western arch—

EGO SVM VITIS VERA ET PATER MEVS AGRICOLA EST MANETE IN ME ET EGO IN VOBIS

I H S

EGO SVM VITIS VOS PALMITES QVI MANET IN ME ET EGO IN EO HIC FERT MVLTVM FRVCTVM.

In the northern arch (over the organ)—

BENEDIC ANIMA MEA DOMINO ET OMNIA QVAE INTRA ME SVNT NOMINI SANCTO EIVS

A Ω

IVBILATE DEO OMNIS TERRA SERVITE DOMINO IN LAETITIA

Sgraffito is also employed on the walls of the antechapel in a diaper pattern, with this text over the entrance to the nave—

INTROITE PORTAS EIVS IN CONFESSIONE ATRIA EIVS IN HYMNIS

The sgraffito was cut and worked by two young Oxonians, pupils of the architect, Mr. William H. Nicholls, of Hertford College, and Mr. Douglas Stewart, of Oriel.

The great window of the south transept refers to Giggleswick School and its benefactors and *alumni*. In the middle light is Edward VI. copied from an illumination in the charter given by him to the school, and below him is the figure of James Carr of Stackhouse, who founded the school in 1512, holding a model of the first building in his hand. In the other lights are Mr. Walter Morrison, holding a model of the new chapel of which he is the donor, Archdeacon Shute, Archdeacon Paley who was a boy here, and the Rev. George Style, the present head master. The figures in the window were drawn by Sir James Linton.

The six clearstory windows bear figures of Christian worthies of various ages, kinds, and denominations, also were designed by Sir James Linton.

North Side.	*South Side.*
1. Martyrs:	4. Warriors:
Sir Thomas More.	Sir Philip Sidney.
King Edmund.	King Alfred.
Bishop Latimer.	General Gordon.
2. Divines:	5. Missionaries:
Bunyan.	Henry Martyn.
Wycliffe.	Columba.
Wesley.	Livingstone.
3. Teachers:	6. Poets:
Alcuin.	Milton.
Wykeham.	Cædmon.
Arnold.	Tennyson.

Below them a band of sgraffito round the nave bears texts from the chapter commonly read in colleges on their Founder's day.

In niches over the west door inside the chapel are two figures in bronze by Mr. George Frampton, A.R.A., representing King Edward VI., who gave the school its charter, and Queen Victoria, whose "Diamond Jubilee" the chapel was built to commemorate.

The whole of the furniture is of cedar, imported by Mr. Morrison direct from the province of Tucuman in the Argentine Republic.

The boys' seats occupy the nave right and left of a wide central passage, and at the west end are eight stalls under canopies for the head-master and others. These western stalls have carved and pierced standards to the canopies, containing figures of the Four Evangelists writing their Gospels, and attended by their emblems. The figures were modelled by Mr. Carter, and are treated in a broad, simple manner suitable to the material. In the canopies above are pendants modelled by Mr. Carter, with six figures of prophets—Moses, Elias, Esaias, Jeremias, Ezekiel, Daniel.

The foliage of the capitals of the nave arcades is taken from plants common in the locality; a method which adds a certain local interest to the carving, but which, as in the case of the Oxford Museum, is rather apt to lead to too much realism in architectural detail.

The whole of the carving in wood and stone was undertaken by Messrs. Farmer & Brindley. The lectern is of bronze, and was made from the architect's designs by Messrs. Hart, Peard, & Co., of Drury-lane, London.

The pavement is of black and white marble, with steps of black and a panel of coloured marbles under the dome. In the mosaic borders the following marbles are used: *verd'antico* from the ancient quarry of Casambala in Thessaly, and porphyry-coloured *rosso* from Scutari in Laconia, Peloponnesus. The central disc is of red Pavonazzetto breccia marble from the Isle of Scyros in the Cyclades: a small bronze cross let into it marks the exact centre of the dome above. Of the four smaller discs two are from the ancient Cipollino quarries at Stura in Eubœa. A third disc is of Irish green from the Lousouter quarry, Recess, Galway, and the fourth is of yellow breccia from Stazzema, Tuscany. The white in which these coloured marbles is inlaid is second-quality statuary marble from Crestola, near Carrara. For the rest of the pavement hard white marble from Serravezza is used, and the black comes from Mazy in Belgium. The marble was supplied and laid by Messrs. Farmer & Brindley, of London.

The chapel is heated by the hot-air apparatus of Messrs. Haden & Son, of Trowbridge, which is placed in a vault under the antechapel.

The copper and lead of the roofs was supplied and laid by Messrs. Dent & Hellyer, of Newcastle-street, Strand, London.

The building was erected under Mr. Richard Evans as clerk of works, "of whose care and pains both employer and architect feel they cannot speak too highly." The foreman during the first part of the work was Mr. Bleazard, who was succeeded, on his appointment as Borough Surveyor at Clitheroe, by Mr. Kitchen. The workmen were engaged and paid, and material bought, by the employer without a general contractor, though the labour in the carpentry and joinery was contracted for by Messrs. Brassington Brothers & Corney, of Settle.

CHURCH, BLACKHAM, SUSSEX.—The foundation-stone of a new mission church has just been laid at Blackham. When completed the building will be dedicated to All Saints'. It will consist of a nave and chancel with a stone bell turret. It is being built of stone from the Hackenden quarry at East Grinstead, with Bath stone dressings, prepared by Messrs. Jenner & Grynyer, of East Grinstead. The bricks used inside have all been made at Blackham. Mr. Charles Day, of Cowden, is the builder, and Mr. Lacy Ridge the architect. The accommodation to be provided is for 150 persons.

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Correspondence.

To the Editor of The Builder.

A QUESTION OF RESPONSIBILITY.

Sir,—In a bill of quantities for work which I have now in hand I have put several prime-cost values for materials and fittings to be selected by myself, including a p.c. item for hot-water apparatus with an item attached "Allow for profit and waiting upon same." I find that the contractor whose tender is accepted has put nothing against the latter item. Can he now charge me for waiting upon and making holes, &c., for the hot water engineer? OMEGA.

SHAFTESBURY HOUSE, LONDON WALL.

Sir,—While there is time and opportunity to amend it, I desire to draw attention to the want of clothing with "architectural grace" displayed by the mass of irregular brickwork at the summit of Shaftesbury House, London Wall. This unsightly aggregation of rooms in the rear of the mansard roof of the Finsbury Circus frontage is the closing feature of the vista of Copthall-avenue, which joins London Wall at a right-angle.

It would be a pity for so fine a building to be left with this blot on its SKYLINE.

THE HOARDING BEAUTIFUL.

Sir,—The attempt in Holborn (and recently in the Strand) to make a hoarding, if not a thing of beauty, at least somewhat less of an eyesore than is usually the case, is certainly a laudable effort. A hoarding may be a necessary evil, but it does not follow that it should not be an ornamental one, and help to do what we hope the art poster on hoardings is doing, and that is the exerting of a little influence on the artistic sensibilities of that important person, "the man in the street."

AUGUSTINE C. PASSMORE.

*** Our correspondent might also have mentioned the hoarding recently erected by Messrs. Waring in Oxford-street: an excellent example.—Ed.

TESTS FOR WHITE LEAD.

Sir,—Could any of your numerous readers inform me through the columns of your paper the best and most effective test to apply in order to find out the quality of white lead? E. G.

The Student's Column.

GAS AND GAS FITTINGS.

15.—Gas-Fires.

LUMINOUS AND NON-LUMINOUS FIRES.—Gas-fires may be divided into two classes—(1) those fitted with "atmospheric" burners, in which air is allowed to mix with the gas before the point of ignition; and (2) those fitted with burners to which air is not admitted before the point of ignition, and which therefore produce luminous flames. The heat produced per cubic foot of gas consumed is precisely the same in the two classes of fires, provided that the gas be consumed under suitable conditions, but the admixture of air before the point of ignition not only renders the flame non-luminous, but makes it much shorter, and the heat of combustion is therefore concentrated in a smaller area than in a luminous flame.

Radiated and Convected Heat.—Radiant heat is that form of heat which is transmitted from one body to another without materially raising the temperature of the atmosphere through which it passes. Convected heat is heat conveyed by particles of heated air or other similar medium. Rooms heated by convected heat alone (*i.e.*, by hot air, steam, or water pipes) are never so comfortable as those heated by the radiant heat from an open coal or coke fire. The temperature may be raised more economically by convected heat than by radiant heat, but the inhalation of heated air is prejudicial to health, and the walls of rooms heated by convected heat remain at a comparatively low temperature, and absorb heat from the human body. In rooms well heated by radiant heat the atmosphere remains comparatively cool, while the walls and furniture are raised to a temperature sufficiently high to prevent them abstracting heat from the body and producing a sensation of chill. Warming by radiant heat alone is, however, too costly for general practice, and a combination of the two systems is usually adopted. An incandescent gas fire is used as a source of radiant heat, while the hot waste products of combustion are led through channels at the sides and back of the fire and form a source of convected heat (fig. 37). The channels act as hot-air pipes, and raise the temperature of the atmosphere of the room.

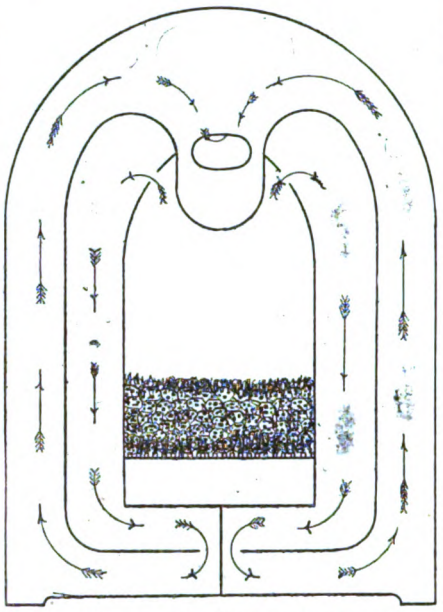

Fig. 37.—Gas Fire in Section.

A luminous flame contains solid particles of carbon in an incandescent condition, and therefore emits more radiant heat than a non-luminous flame, but the latter is more useful for indirectly producing radiant heat because it can be used for raising a suitable medium, such as fireclay or asbestos, to incandescence, and when thus employed is more effective as a source of radiant heat than the luminous flame.

"Atmospheric" Gas Fires.—Fires fitted with "atmospheric" burners must be supplied with gas under a pressure sufficiently high to prevent the "flashing back" of the flames when subjected to draughts of air produced by open doors or windows, and to enable the gas by its uprush to draw in sufficient air through the air-holes in the burner to produce a non-luminous flame. With London gas a pressure of about 1½ in. is a good working pressure for most of the fires now made. When the pressure becomes lower than this the flames have a tendency to "flash back," and when the pressure exceeds this limit the gas consumption becomes excessive and out of proportion to the heat obtained in the room. It is commonly stated that a pressure of ¾ in. is the most suitable pressure for gas fires, but this is certainly incorrect for average working conditions. It is now a common practice to mix carburetted water-gas with the coal-gas sent out from the gasworks. This mixture has a higher specific gravity than the coal-gas, and therefore should be supplied under a higher pressure; it has, moreover, a different chemical composition and requires less air for its combustion than plain coal-gas. As the proportion of water-gas in the mixture varies, so should the proportion of air admitted through the air-holes of the burner be varied. To meet this difficulty Messrs. Richmond & Co. manufac-

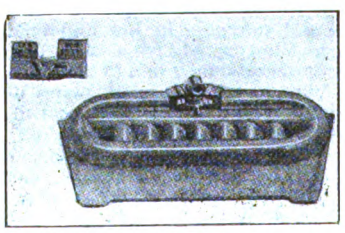

Fig. 38.—Water-Gas Attachment for Gas Fires.

ture a simple "water-gas attachment" (fig. 38) for gas fires by means of which the size of the air inlet to the mixing tubes of gas-fire burners can be regulated as required.

The effect of mixing such large volumes of carburetted water-gas as the 30 per cent. and 40 per cent. now commonly used, and burning this mixture in fires adjusted to consume plain coal-gas is to cause the burners to produce short, greenish, noisy flames which do not reach the upper layers of fuel; but when the size of the air inlet is reduced the flame becomes elongated, the noise almost ceases, and the upper layers of fuel become incandescent.

A somewhat similar effect is produced by the accumulation of dust and dirt over the gas inlets of the burners, owing to the reduction of the volume of gas passing through them, the deflection of the current from its vertical flow, and the excessive proportion of air to gas in the mixture flowing to the point of ignition.

The burners (both nozzles and mixing tubes) of all gas fires require periodical cleaning, and it is an objectionable feature of many otherwise excellent gas fires that the burners cannot be removed and cleaned without the assistance of a gasfitter. Gas fires which are quite satisfactory when first used, often become in the course of a few months exceedingly unsatisfactory, and in many cases the consumer does not know whether the fault is with the gas or the gas fire. Dust from the asbestos or fireclay fuel, or from the atmosphere of the room, gradually accumulates in the mixing tubes and on the burner nozzles, the flames become shorter, greener, and more noisy, and have a strong inclination to "flash back," and at last the climax is reached when the fire cannot be lighted without allowing the flames to flash back, with the result that the flames become luminous and emit an intolerable noise and stench. In nine cases in every ten the burners are fitted in an inaccessible position, and are concealed by the outer casing of the fire, and consequently the average consumer is entirely dependent upon the local gasfitter. There is no reason why the burners should not always be fitted in a readily-accessible position, so that the consumer may, without undue inconvenience or loss of time, himself remove and cleanse them whenever necessary.

Ball Fuel for Gas Fires.—The so-called ball "fuel" for incandescent gas fires may be made of any refractory material, but some materials are more suitable than others, and the shape of the ball is a matter of considerable importance. At one time massive lumps of asbestos having only one central hole made through them were extensively used, but these will not become thoroughly incandescent in fires of ordinary size, and have now been superseded to a large extent by balls of more open formation constructed of fireclay or fireclay mixed with other silicates. The two descriptions of fuel are shown in fig. 39.

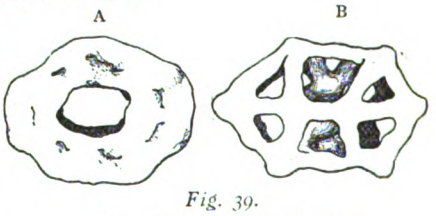

Fig. 39.

A. Gas Fire Fuel of Bad Shape.
B. Gas Fire Fuel of Good Shape.

The modern "hollow" fuel (*b*) becomes more uniformly heated, and is more rapidly heated to incandescence. Instead of using the refractory material in lumps it may with equal advantage be used in the form of vertical strips as in asbestos fibre fires, and even the old-fashioned iron spray fires are quite as effective as the modern ball fires. In the Clamond gas radiator manufactured by the Kern Burner Company, a number of vertical fireclay tubes, perforated throughout their length, are heated by non-luminous flames supplied by horizontal burners constructed on the principal used by Kern in constructing the Kern burner for incandescent gas lighting. The proportion of radiant heat emitted by these fires is unusually high.

Condensing Stoves.—When coal-gas is burned the hydrogen it contains unites with the oxygen of the atmosphere to form water vapour, which condenses to liquid water as soon as its temperature becomes sufficiently low. About one pint of water is produced from every 30 cubic feet of gas consumed. In condensing stoves the products of combustion are conducted through a number of vertical pipes, and become cooled below the temperature at which the water vapour condenses before they escape into the atmosphere. The water trickles down the pipes and is collected in a pan beneath the stove. But another compound always produced in large proportion when coal-gas is burned is carbon dioxide, or

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carbonic acid gas. This gas is not condensed in condensing stoves to any considerable extent, and as it is not a supporter of animal life it should not be allowed to escape into the atmosphere of a dwelling-room. Condensing stoves are larger than ordinary fires, because they must contain sufficient condensing area to cause all the water vapour to condense, and are apt to convey an exaggerated impression as to their heat-producing capabilities. Condensing stoves are suitable for halls and greenhouses, but should not be used in dwelling-rooms, unless provided with a flue. The condensed water obtained in the collecting-pan is not pure water, but contains sulphur compounds and other impurities.

Flues.—No gas fire or stove should be placed in a dwelling-room without being connected to a flue capable of carrying the products of combustion away from the room. Many condensing and other fires are manufactured which are recommended as capable of burning gas without vitiating the atmosphere of a room even where no flue is employed, but no heed should be given to the assurances of vendors that a flue is unnecessary. A gas fire should never be used in a small dwelling-room unless connected to a flue having a natural updraught. Sometimes a gas fire is used in place of a coal fire because of the nuisance created by a smoky chimney, and, owing to the absence of soot when gas is burned, the fact that the down draught forces the products of combustion into the room is unheeded. Gas fires used under such conditions naturally cause headache and loss of health.

Vaporising Stoves.—Some persons complain that gas fires cause an uncomfortable dryness of the atmosphere of a room. Mr. Fletcher has conducted a series of experiments which prove that the atmosphere of a room is not rendered more dry by the use of a gas fire provided with a flue than by the use of the coal fire, and he is of opinion that the alleged dryness is always due to a trace of the sulphur compounds in the products of combusion escaping into the room through a defective flue. Where the flue is perfect and a strong up draught is maintained no such feeling of dryness is experienced. To meet all requirements, however, most of the gas-fire manufacturers now manufacture a fire fitted with a well to contain water, the water being slowly vaporised by the heat from the fire. Arden Hill's "Acme" vaporising fire is a fire of this description and is shown partly in section in fig. 40. A is the front casting of the fire, B the water vessel, and C the firebrick.

Fig. 40.—Vaporising Gas Fire.

Vaporising fires appear to be rapidly growing in popularity, and are very serviceable for sick rooms where a moist warm atmosphere is required. A shallow pan of water placed in front of an ordinary incandescent gas fire may, of course, be used instead of a specially constructed vaporising gas fire, but is not so convenient.

Reflecting Stoves.—Small luminous flat or rat-tail flames are employed for reflecting stoves, the flames being placed in front of a reflector of glass or polished metal. If the products of combustion are conducted through suitable tubes or chambers to utilise as much heat as possible before allowing them to escape into the flue, reflecting stoves form very efficient heating agents. They are less liable to get out of order and are more readily repaired than fires with "atmospheric" burners. As the flames never come in contact with any cool surface, they do not, as a rule, evolve any disagreeable odour or poisonous incomplete products of combustion, but they should, nevertheless, be connected to a flue. The temperature of the combustion products as they enter the flue should always be sufficiently high to feel hot to the hand. If cooled to atmospheric temperature, water would be condensed in the pipes, and the remaining combustion products, being heavier than air, would probably fail to rise to the top of the flue.

BOOKS RECEIVED.

THE ART OF BUILDING A HOME. By Barry Parker and Raymond Unwin. (London: Longmans, Green, & Co.)

A PRIMER OF GEOMETRY. By H. W. Croome Smith, B.A. (Macmillan & Co.)

OBITUARY.

MR. BROOKS.—We greatly regret to announce the death on the 7th instant at his residence, "The Grange," Park-lane, Stoke Newington, of Mr. James Brooks, senior member of the firm of James Brooks, Son, & Godsell, of 35, Wellington-street, Strand, W.C., and one of the most eminent architects of the day, especially in church architecture. Mr. Brooks was born at Hatford, Wantage, on March 30, 1825, and received his earlier education at the Grammar School, Abingdon. Coming to London in 1847 he was articled to Lewis Stride, attended Professor Donaldson's classes at University College, and entered as a pupil at the Royal Academy Schools. Having begun to practise just fifty years ago, he became a member of the Architectural Association in 1884; in 1866 he had been elected a Fellow of the Royal Institute of British Architects, of which he was a Vice-President, 1892-6, and member of the Council and of the Art Standing Committee, 1900-1. In June, 1895, he received at the hands of Mr. F. C Penrose, the President, the Royal gold medal; on that occasion we published his portrait in our columns of June 29, 1895. In June, 1888, he was appointed to succeed Joseph Clarke, deceased, as architect to the diocese of Canterbury; he was architect to the Diocesan Society of Canterbury, and was consulting architect to the Incorporated Society for Building Churches. Some years ago he took his son, Mr. J. Martin Brooks, into partnership, under the style of James Brooks & Son, in August last Mr. G. H. Godsell, of Hereford, was admitted partner of the firm, under the style of James Brooks, Son, & Godsell.

Of the principal architectural works planned and designed by Mr. Brooks, and more recently by the firm, a large number have been described and illustrated in our columns. Of new churches we should mention the following:—St. Michael's, at the corner of Paul and Mark streets, Shoreditch, and the reredos (executed by Earp), 1865; St. Saviour's, Hyde-road and Penn-street, Hoxton [May 5, 1866, two views*]; St. Columba's, Kingsland-road, Haggerston [December 11, 1869*]; St. Chad's, Nichols-square, Hackney-road, Haggerston, 1869; the Church of the Annunciation, Chislehurst, 1870, for which he designed the screen and superintended the designing and execution of the decorative frieze around the triforium stage of part of the church, and of the decoration of the Lady Chapel; St. Mary's, Wednesbury; St. Andrew's, Plaistow, 1870, and the screen (executed by Earp); the Church of the Transfiguration, Lewisham, 1882; St. Peter's, St. Leonard's-on-Sea [May 5, 1883*]; All Saints', Ipswich [July 28, 1883*]; St. Michael's, Coppenhall [May 17, 1884*]; St. John the Baptist, Holland-road, Kensington, 1877-8, completed in 1891, and the screen (sculptured by Mr. J. E. Taylerson [April 23, 1892, west front elevation; and June 29, 1895*]; Holy Innocents', Hammersmith, 1890-1, of which the new west portion was dedicated on April 27, 1901 [January 1, 1887*]; St. Andrew's, Willesden Green, 1886-7 [January 2, 1886*]; St. Mary's parish church, Hornsey, 1888-9 [May 12, 1888, and March 30, 1889*]; All Saints', Southend-on-Sea [October 1, 1887*]; the Church of the Good Shepherd (originally All Hallows), Mansfield-road, Gospel Oak, Highgate, and the parsonage, 1894-5 [March 23 and 30, 1889, December 29, 1894, June 29, 1895*]; St. Mary's, Highgate [August 15, 1896*]; St. Peter's, Hornsey, consecrated on July 1, 1898 [August 15, 1896*]; St. Luke's, Enfield [September 24, 1898, north-east view; and June 17, 1899, interior of east end*]; SS. Peter and Paul, Charlton, near Dover [May 30, 1891, view, elevation, plan, and section*]; the Chapel, Tonbridge School [May 14, 1892*]; and All Saints', Perry-street, Northfleet. To the foregoing should be added a stone pulpit for St. James's, West Hackney (Sir R. Smirke, architect); alterations at St. Mary's, Brunswick-street, Haggerston, in 1861 (Nash, architect, 1827); the remodelling of St. Andrew's, Totteridge, and addition of the chancel and apse, in 1869; oak screen, St. Matthias', Stoke Newington (Butterfield, architect), in memory of the late Mr. Robert Brett, who died in 1874; remodelling of All Saints', Norfolk-square, Paddington, after the fire, and addition of chancel, in 1873; completion of St. Faith's, Stoke Newington (Burges, architect), and the new mission hall [December 29, 1883*]; reconstruction and enlargement of St. Margaret's, Lee, upon the model of the Lady Chapel, Salisbury Cathedral, 1875-6 [June 30, 1888*]; restoration of the parish church, Northleach, Gloucestershire [October 6, 1883*]. An extensive range of stabling for the Marquis of Londonderry [February 17, 1883*]; a house at Rondebosch, Cape Town, for Mr. W. H. Stryben [July 13, 1889*]; and the South-Eastern Railway Company's hotel at Deal [June 17, 1893]. On January 15, 1887, we published Mr. Brooks's designs, with elevations, sections, and plans, for St. Paul's Church, Vicarage Gate, Kensington; his remarkable design for the proposed cathedral at Liverpool, and the Chapel of St. John, was illustrated in the *Builder* of Jan. 9 and 16, Feb. 6, March 6 (views, plans, sections, and elevations), 1886; and April 28, 1888 (study of one bay of choir); and June 8, 1889 (interior and exterior of the Chapel of St. John). In July last the designs and plans prepared by the firm of Messrs. James Brooks, Son, & Godsell for the Hereford Municipal Buildings were, with two other sets, marked "reserved," out of forty-six sets submitted, Mr. Thomas Blashill being the assessor. Mr. Brooks's designs for the restoration of the parish church at Hatford, his native place, were exhibited at the opening conversazione of the Architectural Exhibition, in December, 1855; we believe the work was not carried out until some years afterwards.

MR. LITTLEWOOD.—We regret also to announce the death, on September 25, at his residence in Lansdowne-villas, Old Trafford, of Mr. John Littlewood, in his seventy-third year. Mr. Littlewood—a son of the architect, Joshua Littlewood, of Holmfirth, Yorkshire—was senior member of the firm of Mangnall & Littlewoods, of Manchester, whose practice will, we understand, be carried on by his brother and surviving partner, Mr. William H. Littlewood. Mr. John Littlewood was elected an Associate of the Royal Institute of British Architects in 1882, and a Fellow in 1888; he had been during a long period a leading member of the Manchester Society of Architects. Having served as an articled pupil of the firm of Messrs. Travis & Mangnall, of Manchester, he, after Mr. Travis had retired, was taken into partnership by Mr. William Mangnall. On the death of the latter, he and his brother, Mr. William H. Littlewood, in 1875, entered into partnership under the name of Messrs. Mangnall & Littlewoods, and established an extensive practice as architects and engineers, mainly in association with the construction of workhouses and public baths, and of hotels, piers, concert pavilions, ballrooms and similar structures at Blackpool, Morecambe Bay, Colwyn Bay, Bridlington, and other places of popular resort in the northern counties. Of the principal works designed and carried out by the firm we may mention the following:—The public baths at Broughton for the Corporation of Salford, for which their plans and designs were selected, in October, 1889, out of those submitted by seven competitors; the enlargement, at an estimated cost (for the building) of 58,000*l.*, of the Stockport workhouse, on the Shaw Heath site, to accommodate 1,098 inmates; the public baths, at the corner of Regent-road and Derby-street, Salford, for the Salford Corporation; the new workhouse at Patricroft for the Guardians of Barton-upon-Irwell Union, for about 500 inmates—their plans having been accepted in competition in 1892; the Victoria Pavilion Theatre, as an addition to the buildings in the winter gardens at Morecambe, 1896-7; the Hôtel Métropole, at the end of the West End Promenade, Morecambe, for which their plans were awarded the first premium by Messrs. Harrison, Hall, and Moore, the assessors, in July, 1897; the pier, with pavilion, at Morecambe, opened in July, 1898; the Victorian pier and concert pavilion at Colwyn Bay, begun in May, 1899, and opened on June 2, 1900; the new stands, including a grand saloon and a covered promenade, on the Roodee course at Chester for the Chester Race Company; and the grand stand on the flat-race and steeplechase courses recently laid out on the Low House estate, for the Ripon Racecourse Company. In a competition in January last, Messrs. Mangnall & Littlewoods won the first premium with their plans for the extension of Prince's Parade, with an iron pier and promenade and pavilion at Bridlington; and in 1899 they were appointed architects and engineers for the pavilion and promenade pier at the North Cliff, Bridlington, for the Pier and Pavilion Company, as also of the Grand Hotel, with theatre, arcade, &c., on the Beaconsfield Estate, Bridlington. They were invited in May, 1898, to take part in the competition for the new workhouse buildings at New Cross, Wednesfield, for the Wolverhampton Board of Guardians, on which occasion an honorarium of 100*l.* was awarded, upon the adjudication of Mr. Aldwinckle, in respect of the plans and designs submitted by Messrs. Mangnall & Littlewoods and Mr. M. Johnson, as joint architects. In 1877 the firm were appointed to carry out the design and construction, at an estimated cost of nearly 800,000*l.*, of new gas works for the Manchester City Council upon a site of 39 acres near Philips Park.

MR. W. SWIFT.—We have also to announce the death, on September 24, in his fifty-second year, at his residence, No. 5, The Parade, Truro, of Mr. William Swift, of No. 4, Princes-street, Truro, architect and surveyor. When about thirty years of age Mr. Swift removed from Birmingham to Truro. After having been employed under Messrs. Henderson at the Mining Schools he started in practice independently eight or nine years ago. Of his architectural works during that period we may cite a house at St. Clement's Hill, Truro, for Mr. M. H.

* Illustrations in the *Builder*.

* Illustration in the *Builder*.

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Williams; the church Sunday-schools at Perran-ar-Worthal, built of local stone with granite facings; the Hotel Buildings, Truro, for Messrs. Mallett & Co.; an enlargement of the National School Buildings, Falmouth; the Swan Hotel, Truro; a residence, near Tregony, for Mr. T. H. Beard; alterations and improvements of the Fountain Hotel, St. Mawes; and new business premises, for Messrs. J Grose & Sons, in Porhan-road, Falmouth.

MR. WATSON.—We regret to announce also the death on October 3, at Wakefield, in his sixty-first year, of Mr. William Watson, a well-known member of the profession in the West Riding. One of his latest works was the Canal-lane Board School, for 460 children, at Lofthouse Gate, near Wakefield. Mr. Watson made the plans and designs for the infirmary and steam laundry at the Wakefield workhouse, built in 1897-8, at the rear of the old workhouse buildings in Park-lane, to accommodate 150 patients, a resident medical officer, lady superintendent, nursing staff, and servants, in a central block with two pavilions.

GENERAL BUILDING NEWS.

CHURCH, CHICHESTER.—The foundation-stone of a new parish church for the district of Rumboldswyke, one of the suburbs of Chichester, was laid recently. The church is to be called St. George, and, when erected, will provide accommodation for 500 people, the cost under the contract, which is in the hands of Messrs. Dove Brothers, with Messrs. J. E. K. & P. Cutts, of London, as architects, being 3,500*l.* The edifice, when completed, will consist of nave, north and south aisles, chancel, morning-chapel, organ-chamber, vestries, and west porch. The church is being built of local stock bricks, with moulded red-brick jambs and arches throughout. The roof will be open timber. The body of the church will be paved with wood blocks and seated with chairs, and the chancel will be paved with tiles laid in patterns.

CHURCH EXTENSION, RAVENSTHORPE.—Additions to St. Saviour's Church, Ravensthorpe, were consecrated by the Bishop of Wakefield recently. The addition to the church consists of transepts, a north chapel, and a large vestry chancel, and a north aisle is to be added, with clearstory and arcading to the nave, the cost in all being estimated at 8,500*l.* Mr. C. H. Fowler, F.S.A., of Durham, prepared the designs, and Mr. Thickett, of Horbury, has carried out the work.

PROPOSED RESTORATION OF KILDWICK CHURCH, YORKSHIRE.—The scheme for restoring the old Church of St. Andrew, at Kildwick, popularly known as the "Lang Kirk o' Craven," will be begun very shortly. The scheme is one prepared by Messrs. Austin & Paley, architects, of Lancaster.

PRESBYTERIAN CHURCH, LIMERICK.—A new Presbyterian church has just been erected at Limerick by Messrs. John Ryan & Sons, builders, from the plans of the architect, Mr. G. C. Ashlin, Dublin.

CHURCH FOR SMETHWICK. — The foundation-stone of a new church for the recently formed parish of St. Stephen's, Smethwick, was laid recently by Mr. G. F. Chance. The architect is Mr. F. T. Beck, of Wolverhampton. It was stated that the total cost of the church would be 4,750*l.*

PARISH CHURCH, HOVE.—The new parish church, Hove, has just been opened. The church is of Sussex sandstone, from the quarries of Sir Weetman D. Pearson, Bart., M.P., at Paddockhurst, Worth, and has been erected to the designs of the late Mr. J. L. Pearson, R.A. The seating accommodation is for about 1,300, and the church is 160 ft. long and nearly 80 ft. broad. The nave, which, including the transept, is 108 ft. long and 35 ft. wide, is divided into six bays. The two western bays, which open respectively into the baptistry and the base of the tower, are marked by lofty moulded arches springing from clustered piers attached to the north and south walls. The next four open into the north and south aisles, and are each of them 16 ft. wide. The arcades consist of clustered piers, 17 ft. high, from which spring pointed arches. Above these comes the clearstory. The two eastern bays of the nave, which open respectively into the north and south transepts, are somewhat wider than the others, and the arches reach up to the level of the clearstory. The chancel arch is of a similar height and design to that which separates the western bays from the nave proper, but is more rich in detail; and beyond this the three bays of the chancel carry on the design of the nave, and from their width provide space for the choir stalls. One of the features of the church is the sanctuary, which is 23 ft. in length. Although entered by an arch, 58 ft. high and 35 ft. wide, the sanctuary is gradually narrowed in width to 27 ft. The east windows—three in number, with two lights each—are deeply recessed within pointed arches with clustered piers. There are also two lofty windows on either side of the chancel. The two aisles are respectively 21 ft. and 16 ft. wide internally, that on the south side of the nave being the wider of the two, and are lighted with windows of three lights each; while the transept is lighted by a traceried window of five lights at the south end and a rose window at the other end. Leading out of the south transept, a small chapel, 46 ft. by 21 ft. provides accommodation for daily or occasional services. It is 32 ft. in height. Like the baptistry at the west end of the church, it is vaulted throughout, and at the east end it terminates in a polygonal apse. The south wall of the two western bays of this Chapel, it may be added, is completely filled in with six-light windows of very broad proportions, while those of the apse are of three lights each and are comparatively narrow and lofty. To the north of the choir and sanctuary there is the organ loft and two vestries, that for the choir measuring 20 ft. by 24 ft., and over the vestries there is a church-room with accommodation for about 100 people. The roof, except where it is vaulted, is of oak. In the nave it is divided into six bays by clustered wall shafts rising to a height of 36 ft. From this height a series of cross arches carry it up to within 10 ft. of its extreme height, where it terminates with a simple cornice. The total cost will exceed 40,000*l.*

ST. BOTOLPH, STOW LONGA.—The ancient church of St. Botolph, Stow Longa, Hunts., was reopened on Wednesday, the 2nd inst., after the rebuilding of the clearstory and erection of new roofs to the nave and aisles from the designs of Messrs. John & S. Inskip Ladds, joint architects, London. The church dates from Late Norman times, and has a fine priests' door with carved tympanum. The nave arcades are Early English, and the aisles are chiefly of Late Decorated date, while the fine west tower and the windows of the chancel are Early Perpendicular. It would appear that the clear-story and nave were destroyed (probably by a storm) in the seventeenth century, when the walls were levelled, and a plain roof of barn-like character put on, and covered externally with tiles. When the chancel was restored, in 1880, certain works were also done in the nave, and amongst other things the broken stones of the clearstory windows were found. These were of simple Perpendicular character, and have given the keynote to the present work. The lower half of the clearstory remained, and the small buttresses at the west end were sufficiently intact to show the original height of the clearstory walls. Weldon stone has been used throughout, and the mason has been Mr. H. Ashley, of St. Neots. No sufficient evidence of the form of the old roof remained—it was probably of flat pitch covered with lead, but owing to the great cost of adopting this form for the new work, it was determined to retain the steeper pitch of the seventeenth-century roof, and to re-use the old tiles, thus preserving some memory of the last roof. Another link with this roof is formed by the old tie beams which have been framed into the three middle principals, where they will still continue to perform the work they have done in the past. The aisle roofs are quite plain, except the eastern part of the south aisle, where an ancient chapel has again been fitted up with an altar (for use as a morning chapel), and here the roof is ceiled with oak boarding, having moulded ribs and carved bosses. The whole of the timber is English oak of large scantlings, supplied by Messrs. Francis & Sons, of Huntingdon; Messrs. Wrycroft & Sons, of St. Neots, being the contractors for the carpenters' work. The glass is by Messrs. Pepper & Sons, of London, and the lead work of aisle roofs, &c., by Messrs. Peacock & Sons, of Huntingdon. A new wood block floor has been laid to nave and aisles by Messrs. Goddard & Sons, of Farnham, Surrey. The new side altar, made by Mr. Reid, was also designed by Mr. Ladds. The total cost of the work has been 1,150*l.* This work practically completes the restoration of the church, which has extended over twenty-five years.

INFECTIOUS DISEASES HOSPITAL, BERWICK.—The Town Council of Berwick having applied to the Local Government Board for sanction to borrow 5,500*l.* for the erection of an infectious diseases hospital, the Local Government Board held an inquiry at Berwick Town Hall on the 2nd inst. Mr. Wm. Weatherhead, the clerk to the Sanitary Authority; Dr. Heagerty, medical officer of health; Mr. J. L. Miller, architect; and others were heard in support of the scheme.

SCHOOL BOARD OFFICES, KING'S NORTON. — These new offices occupy a site adjoining what was the schoolmaster's house. The style is Free Renaissance, and the building is built of bricks with a liberal use of red terra-cotta dressings, the roofs being tiled. The accommodation consists of a roomy entrance-hall and corridor, from which is entered the boardroom, an apartment 28 ft. long, 17 ft. 6 in. wide, and 18 ft. in height. It is handsomely fitted up, and has a pitch-pine panelled dado, open roof with cut and carved principals, and stone corbels. The clerk's office adjoins the boardroom, and is provided with a fireproof strong-room. There are also a waiting-room, cloakroom, and lavatory; and there is communication with the caretaker's house. The buildings are heated with low-pressure pipes and radiators, in addition to open fireplaces. The buildings have been carried out from designs by Mr. Edward Holmes, Corporation-street, Birmingham, and the contractor is Mr. Harvey Gibbs, of King's Heath.

INFIRMARY, RETFORD. — The new infirmary in connexion with the Retford Workhouse was opened on the 25th ult. The building, which was commenced sixteen months ago, has been erected at a cost of 4,000*l.* It is built on the north side of the workhouse premises, and extends for nearly 200 ft. The whole of the buildings are of ordinary red wire-cut bricks, and the roofs are slated with Bangor slates. There are three entrances: the main, one for the males, and another for the females. The whole of the rooms are heated by means of hot-water and circulating pipes. The architect was Mr. W. Southall, of Retford.

SCHOOLS, PRESTWICK, AYR.—The ceremony of laying the memorial-stone of Prestwick High School was performed on the 24th ult. The building is to accommodate 300 scholars. It contains a hall, 60 ft. by 20 ft., five classrooms, male and female teachers' rooms, cloakroom, and all other conveniences. The building is of red stone, and its total cost will be about 5,000*l.* The architects are Messrs. J. & H. V. Eaglesham, Ayr, and the contractors are:—Masons, Messrs. George Reid & Son, Catrine; joiners, Messrs. Paterson & Anderson, Ayr; slater, Mr. J. C Highet, Ayr; plumber, Mr. James Lockhart, Prestwick; and plasterer, Mr. William Glen, Ayr.

ADDITIONS TO SCIENCE AND ART SCHOOL, MONTROSE, N.B.—The extensive additions to this building are nearly completed. The principal feature is the workshop, which occupies the eastward portion of the building, and which fronts both to Russell-street and Palmerston-street. It is 40 ft. wide, 24 ft. broad, and 15 ft. from floor to ceiling. The shop is fitted with wood-block flooring, and contains twenty-four benches for workers in wood, eight benches for workers in metal, cabinets for specimens, a forge, &c. Immediately to the west of the workshop is the physical laboratory, 30 ft. by 27 ft. Here there are working benches, desks, demonstrator's table, &c. Next to that is a room, 30 ft. by 20 ft., to be used as physical demonstration room. It is fitted with table for demonstrators, benches for students, and museum cases. Next to that room is the chemical laboratory, in which are benches for twenty-four students, demonstrator's table, and fume boxes. To the west of that, again, is the preparation room, 20 ft. by 8 ft., in which the material to be used by the demonstrators will be stored, and where there is a still. Next to that is the balance room, 14 ft. by 7 ft., which, amongst other apparatus, contains a stone balance table to ensure that in measuring out the chemicals there shall be an absence of vibration Continuing westward, the chemistry demonstration room is next reached, which is fitted up with the necessary apparatus. There is also room for the storage of casts from the antique, patterns, models, &c.; while what has hitherto been used as an art classroom in the old building has been entirely remodelled and fitted up with cupboards, "stages" for pupils, diagram frames, &c., and storage has also been provided for clay, zinc, and other materials. The walls of all the rooms are lined with pitch-pine to a height of 4 ft. 6 in., and above that are lathed and plastered. The whole building will be heated with hot water from a heating chamber below the cast room. The piping is carried in ducts under the flooring, and these are connected with radiators placed in the various rooms. The whole will be lighted by electricity, but gas has also been introduced into the laboratories and chemistry and other departments, to be used in the work of the school when required. The porches leading to the different rooms are floored with encaustic tiles, and the walls of the porches are lined with tiles to the height of 4½ ft. The site has cost 1,000*l.*, the contracts amount to about 4,000*l.*, and the cost of furnishing is estimated at 700*l.* The following were the contractors for the work:—Mason—Messrs. J. Ford & Son, Montrose; joiner—Mr. John Davidson, Montrose; plumbers—Messrs. C. Wood & Co., Montrose; slaters—Messrs. J. Lindsay & Son, Montrose; plasterers—Messrs. J. Burness & Son, Montrose; electricians—Angus Electric Lighting Company; heating apparatus—Messrs. C. Wood & Co. The wood-block flooring has been laid by Messrs. Geary, Walker, & Co., London; and the furnishings have been supplied by Mr. J. Davidson and Mr. G. Fairweather, Montrose, and Mr. John Gill, Aberdeen. The architect is Mr. John Sim, of Montrose.

CONVENT, WATERFORD.—The foundation stone of the new chapel to be erected in connexion with the Good Shepherd Convent in Waterford was laid recently. The new chapel will comprise Nun's choir and avant choir at the west end of the nave. There will be two side aisles—one for the accommodation of penitents, and the other for the children of the Industrial School. The principal entrance to the church will be at the west end, having a doorway with double moulded arch and jambs, together with polished marble columns with carved caps and moulded bases. At the west end there will be a circular window filled in with tracery, and having a moulded arch and label over. An arcade of thirteen arches will extend across the full width of the gable. The bell turret will be of octagonal shape, and will go to a height of 75 ft., 9 in. of which will be carried up at the junction of the gable on the penitents' aisle. The Sanctuary will be lighted by a large five-light tracery window. The nave of the church will be divided from the aisles by an arcade of five arches on each side, having polished Aberdeen granite columns with double moulded caps and bases. The nave and Sanctuary on the sides will be lighted by circular sexfoil tracery windows, fifteen on each side. The roof will be divided into eight bays, supported by trusses, resting on shafts, with carved and moulded caps and bases, with corbels

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carved as angels underneath. At the west end of the chapel there will be a large organ gallery, extending the full width of the nave and aisles, having underneath glazed screens, with doors from avant choirs and cloisters. The work will be carried out by Messrs. John Hearne & Son, Waterford, from the plans and under the superintendence of Mr. Wm. H. Byrne, architect, Dublin.

BATHS, CHESTER.—New public baths have just been opened at Chester. The larger of the two baths is the second-class bath, and this, which is only available for the male sex, is 75 ft. long and 35 ft. wide, with a depth of water varying from 3 ft. 6 in. at one end to 7 ft. at the other, and surrounded by dressing compartments, and up above a gallery, in which at water polo and swimming matches there will be accommodation for spectators. When it is not in use as a bath the fittings can be removed, and this bath can be adapted to a gymnasium, or for any other purpose. The first-class plunge bath is rather smaller, being 60 ft. by 30 ft., and so many times a week this will be reserved for ladies. Both baths are lined with white glazed bricks. There are seven second-class slippers and one vapour, three men's first-class slippers and one vapour, and four women's slipper-baths, with waiting-rooms and separate entrances for the sexes. Besides the actual bathing area there are laundry, ironing-room, fitting-shop, and a boiler-house with passage around the whole of the baths, below ground. Then there are the offices and the house of the superintendent. The water used in the baths is taken from the city mains, and heated to what temperature may be required. The baths themselves are heated throughout with steam. The cost of the buildings, which are built in stone and Ruabon brick, was about 11,300*l.* The architects for the baths have been Messrs. Douglas & Minshull, and the contractor Mr. W. W. Freeman.

BUSINESS PREMISES, SUNDERLAND.—Plans have been submitted to the Building Committee of the Sunderland Corporation for the erection of business premises on the site of the Wesleyan Church in Fawcett-street, which was recently purchased by Messrs. Lockhart, Smith & Co., Limited, for 15,500*l.* The chapel is to be pulled down, and the building which it is proposed to put up in its place is to be three and a-half stories in height, with a basement, which will be used as a cafe. The ground floor will consist of three shops. The architects are Messrs. W. and T. R. Milburn, of Sunderland.

BOLTON UNION HOSPITAL. — New buildings have been erected to accommodate the nurses engaged at the new Townley's Hospital connected with the Bolton Union Workhouse at Fishpool, Farnworth. The nurses' home has a frontage of 184 ft. and is in three stories above the basement. The exterior is kept plain: stone sills are put in the windows, but all other dressings are of Ruabon red terra cotta, the general brickwork being faced with local stocks. Accommodation is provided for forty nurses, each having a small separate bedroom. The architects are Messrs. Bradshaw & Gass.

MESSRS. REYNOLDS'S WORKSHOPS.—The Acorn Works, Edward-street, Blackfriars-road, belonging to Messrs. F. W. Reynolds & Co., the makers of wood-working machinery, have recently been enlarged. The adjoining premises having become vacant, two large workshops, each 75 ft. by 30 ft., have been erected there, one as a machine-shop and the other as an erecting-shop, and also a smith's shop adjoining the other two. A large additional yard space has also been acquired, with frontage to Bear-lane. The machine-shop is fitted with a wrought iron gantry extending over the whole surface and carrying a travelling crane. The gantry also supports the line shafts which run the whole length of the building on both sides. The machines driven from these shafts are three large planing machines, eight lathes, one radial drilling machine, one pillar drilling machine, one lathe headstock for large work, one shaping machine, one slotting machine, grindstones, and emery grinding apparatus, &c. A large "lining-out" table has also been erected on a brick foundation, and conveniently placed under the crane. The contract for the buildings was undertaken by Messrs. John Hoare & Son, of Blackfriars-road, under the direction of Mr. Cory, Messrs. Reynolds & Co.'s engineer.

BOARD SCHOOLS, ROTHERHAM.—Three new sets of Board schools were opened recently at Rotherham. In the spring of 1898 the Board invited competitive plans for two new schools at Doncaster-road and Park-street. Plans prepared and submitted by Mr. J. E. Knight, architect, Rotherham, were selected by the Board, and approved by the Education Department; the buildings were commenced early in 1899. The contract of Mr. Richard Snell was accepted for Doncaster-road for 10,557*l.*, and that of Messrs. Chadwick & Co. for Park-street for 9,270*l.* 10s. The site for the Doncaster-road schools was purchased from Earl Effingham, and contains 1 a. 2 r. The buildings are one-storied, and are arranged so as to allow for them and the playgrounds the sunniest aspect, room being left for future extensions. Accommodation is provided for 800 children, comprising boys' department, 240 places; girls' department, 240 places; infants' department, 320 places. Provision for cookery classes in the girls' department is provided. Cloakrooms and lavatories are placed near the entrance. Teachers' and store rooms and lavatories are in the roof. Caretaker's sinks and cupboards are provided. The basement contains heating chamber and coal place. The floors to all rooms are of pitch-pine wood blocks on concrete; those to the corridors are of concrete checkered to prevent slipping. The fireplaces are in coloured glazed bricks with stone mantels. The buildings are heated independently of the fireplaces by pipes and radiators on the low-pressure system. Play-sheds for each department are provided. There is also a caretaker's house. Externally the buildings are of Dunford Bridge rock-faced wallstone, with Grenoside stone dressings, and have green Westmoreland slated roofs. The style is English Renaissance simply treated. The site of the Park-street schools contains an area of 10,340 square yards. The accommodation is for 800 children in three departments—boys and girls 240 each, and infants 320 places. Uniformity has been gained by placing the boys' and girls' schools at the top of the site, side by side, divided by a division wall. The infants' school is placed in the centre of the site. The internal arrangement of these schools is very similar to those at Doncaster-road, the "classroom" system of planning having been adopted here also. The walls are faced with Dunford Bridge rockies, with St. Bees' stone dressings, and green slates to the roofs. A new infants' school, also built from plans prepared by Mr. J. E. Knight, has recently been opened at Thornhill on a site adjoining the existing schools. The new school is built to accommodate 400 children, and contains seven large classrooms (average size, 24 ft. 6 in. by 23 ft.) and a marching hall. There are also two cloakrooms, two lavatories, teachers' rooms and lavatories, storerooms, caretaker's sinks, and a heating chamber and coal-place in basement. Movable glazed screens divide the classrooms from the marching hall, into which all the rooms open separately. By removal of all screens a large place of assembly is formed. A large covered play-shed is provided in the playground, also the necessary conveniences for the children. The caretaker's house is facing Tenter-street. The buildings are of local bricks, with St. Bees' stone dressings.

BOARD SCHOOL, NEWTON HEATH, MANCHESTER.—A memorial stone was fixed in the wall of the St. Mary's-road Board School at Newton Heath on the 5th inst. The school is the thirty-sixth built by the Manchester School Board. It is designed by Mr. Rawle and is being built by Messrs. Bullivant & Sons, and is meant to accommodate the scholars now attending the Oldham-road Board School, formerly known as the Newton Heath Wesleyan School.

TECHNICAL SCHOOLS, SOUTHEND.—The foundation-stone has just been laid of the new technical schools now being erected at the junction of London-road and Victoria-avenue, Southend, as part of a scheme of public buildings, to include town hall and municipal offices. The accommodation in hand will comprise a large lecture hall, laboratories, and demonstration-rooms, classrooms, a complete art school, and all necessary adjuncts. The estimated cost of erecting, equipping, and furnishing the new schools is 10,000*l.*, exclusive of the site, which belongs to the Corporation. The architect is Mr. Henry T. Hare, of Bloomsbury-square; and the builder is Mr. Ernest West, of Chelmsford.

BOARD SCHOOL, GRIMSBY. — The foundation-stones were laid at Grimsby recently of a new Board school. The building will give accommodation for 1,500 children, and the cost is estimated at 21,000*l.* Mr. Herbert C. Scaping is the architect, and Messrs. J. M. Thompson & Sons are the builders.

LONDON CITY AND MIDLAND BANK, BIRMINGHAM.—New premises of the London City and Midland Bank, at the corner of Temple-row and Cherry-street, Birmingham, have been opened The building, which is four stories high, has been erected from the designs of Mr. T. B. Whinney, of London, and Messrs. Mansell & Mansell, Birmingham, and presents a frontage to St. Philip's Churchyard. The style is a rather free treatment of the Italian Renaissance period, the ground floor being boldly rusticated with Tuscan columns, and the story below the main cornice emphasised by carved panels. There is a broad plinth of unpolished Guernsey granite, the main structure being in Portland stone, an iron railing surrounding the building on the pavement level. The whole of the ground floor is occupied by the bank, and in the basement are the strong rooms, voucher stores, lavatories, clerks' rooms, &c. The entrance is on the angle of the building, the corner being carried upwards and finished off in the form of a cupola. Altogether the bank is 80 ft. long, 32 ft. wide, and 22 ft. high, and the upper floors, approached by a lift, are to be utilised as offices, &c. Massive columns of rouge royal marble support the carved and decorated ceiling. A panelled walnut dado, about 5 ft. high surrounds the bank inside, and the pavement of the space used by the public is of grey and white marble.—*Birmingham Gazette.*

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of the following sanitary officers:—Mr. R. K. Brown, medical officer of Bermondsey; Mr. T. H. Littlejohn, medical officer of Hampstead; Messrs. R. W. Hindhaugh and E. A. Norman, sanitary inspectors in Finsbury; Mr. C. Langstone, sanitary inspector in Shoreditch; Messrs. J. Newby and H. L. Hyde, sanitary inspectors in Southwark; Mr. R. Simpson, sanitary inspector in Stepney.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Burke Downing, architect, has removed his London office to 12, Little College-street, Westminster, S.W.——Messrs. Heazell & Son, architects, of Nottingham, have removed their offices from Bank Chambers, Market-place, to Burton Buildings, Parliament-street, Nottingham.

THE STOCK BRICK TRADE.—A Sittingbourne correspondent states that there is a gloomy outlook for the stock brick trade this winter. The Kent and Essex Brickmasters' and Flint Merchants' Protection Association has found it necessary to lower the price of stocks 4s. a thousand, and has given notice that "on and after October 11 the advance hitherto paid in freights will be taken off and the freights paid will be according to the Association lists." This removes the last of the advances made to the brickmakers and barge masters four years ago, when good prices were ruling. The barge masters received an advance of threepence per thousand on the freights at that time, but the advances to the brickmakers was taken off last year. The present reduction will affect practically all the barges engaged in the Kent and Essex brick trade, as all the principal firms are in the Association. In the Sittingbourne and Milton district, which is the centre of production in the stock brick industry, for the first time for several winters men are being "stood off" from their employment; and in other districts barges are being laid up for the season. The brick trade has been brisk, and the exports from Milton Creek for the past six months show an increase over the corresponding period of last year. The flint trade has more than held its own.—*Morning Advertiser.*

PARE'S BANK, LEICESTER.—Messrs. Archibald Smith & Stevens ask us to mention that they supplied the lifts in this building, illustrated and described in our issue of the 21st ult.

ELECTRIC LIGHT INSPECTION BOXES AND THE LONDON BUILDING ACT.—The Stepney Borough Council proposes to convene a conference of Metropolitan Councils to consider the recent decision of the Divisional Court upholding the finding of the magistrate in the case of Crow *v.* the Whitechapel Board of Works. In that case the District Surveyor summoned the Board for having failed to give notice, in accordance with Section 145 of the London Building Act, of intention to construct inspection chambers and street boxes for electric lighting mains. It was contended on behalf of the plaintiff that the boxes were "buildings," "structures," or "works" within the meaning of the section in question, and the magistrate, holding that an offence had been committed, inflicted a nominal fine with ten guineas costs. The Divisional Court, which is the final court for a matter of this kind which comes under the Summary Jurisdiction Acts, dismissed the appeal with costs. In consequence of this decision the Stepney Borough Council, which has absorbed the Whitechapel area, approached the London County Council with a request that facilities might be afforded for raising the point in a civil action, so that a decision of the Court of Appeal might be obtained, or that the District Surveyor should be asked not to insist upon strict compliance with the section upon which he founded his action. As the London County Council is unable to grant either request, the Stepney Borough Council has decided to hold a conference to consider the question, and delegates from other borough councils are being asked to attend. It is considered that if the law as laid down by the Divisional Court is allowed to stand, the effect will be to retard the progress of electric lighting, and at the same time involve the boroughs in heavy and unnecessary expense by having to pay fees to the District Surveyors in connexion with the chambers and boxes.

THE LONDON SKETCH CLUB.—The private view of the Seventh Exhibition of Sketches by the members of the London Sketch Club will be held on Saturday, 12th instant, at the Modern Gallery, 175, Bond-street, W., and the exhibition will be open to the public from the 14th to the 26th inst. inclusive.

LABOUR MARKET IN THE COLONIES.—The October circular of the Emigrants' Information Office (31, Broadway, Westminster) states that in *New South Wales* the strike of the ironworkers' assistants, which lasted some weeks, has been settled by reference to arbitration; the men demand a uniform wage of 7s. a day, and the employers decline to give that wage to any except first-class men, others to have 6s. The building trade is brisk, and there is a continued demand for plumbers and competent labourers. At Broken Hill there is a demand for skilled silver miners, engineers, and fitters. Recent reports show that there is practically no demand for labour at Hillston, Newcastle, Lithgow, Bulli, Young (except for farm and station hands), Mudgee (except for ploughmen), Wilcannia, Walgett (except for farm and station hands and for female servants), or Bourke. In *Victoria* the drought has broken up to some extent in the Mallee and other parts, and this should improve the demand for labour in the country districts. There have been demonstrations of the unemployed in Melbourne, though it is often difficult to procure competent workmen. In Castlemaine, Bendigo, Daylesford, &c., there is no demand for labour. In *South Australia* the supply of local labour is sufficient,

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Queensland is still suffering from the drought, and emigrants, other than female servants, are not recommended to go there at present, unless they receive nominated passages or take a little money with them. In *Western Australia* the report of the Government Labour Bureau for the quarter ending June 30 last shows as follows:—There is a demand for competent mechanics in the building and other trades at Northam, Perth, and Dongarra, and for sawmill hands at Albany, but otherwise the supply in the colony is quite sufficient, and in some places, as Coolgardie, Kalgoorlie, Freemantle, Collie, and Albany the supply is in excess of the demand. During June, 388 persons called at the bureau in search of work. The serious strike of railway line repairers, which arose on a question of wages, has been settled by arbitration. The repairers are to receive 8s. a day instead of 7s. The last reports from *New Zealand* show that the building and engineering trades continued busy almost everywhere. In *Natal* a few skilled platelayers only are wanted on the railways. They must be from 25 to 40 years of age, and must have had at least five years' experience on railways; candidates must apply to the Agent General for Natal, 26, Victoria-street, London, S.W., stating age, height, and experience, and enclose testimonials. In *Cape Colony* there is officially stated to be a demand for thoroughly skilled mechanics in the building trades. Otherwise all persons are again warned against going to South Africa at present in search of professional or manual work unless they have ample private means to meet the very high cost of living, or have engagements to go to. They will not as a rule be allowed to proceed up country.

WOLVERHAMPTON ART AND INDUSTRIAL EXHIBITION.—Another important step in the preparations for the forthcoming Wolverhampton Art and Industrial Exhibition was, says the *Wolverhampton Express*, taken recently, when the Buildings Committee met and considered the tenders sent in for the erection of the great Machinery Hall. This in some respects will be the most important building erected. It will stand next to the Industrial Hall, separated from it by Devon-road. It will be 350ft. in length and 130ft. in width, having a "Belfast" roof in three spans, the centre one being of 60 ft. The two outer spans will be kept down so as to allow direct lighting to the centre. As it is to contain all sorts of machinery, some of great weight, both stationary and at work, the hall will be of somewhat more substantial character than the other buildings, and concrete foundations will be provided for the heavy exhibits. Its chief decorative features will be found at the end facing the Industrial Hall. In the front of the building the main entrance is flanked on either side by an ornamental fountain. Over the main entrance will be a semi-circular ornament, filled in with radiating bars, which at intervals will be fitted at the terminals with coloured electric light. One of the most striking and novel features of the building will be the main doorway. At each end of the front elevation is a dwarf tower, surmounted by a semi-circular dome, two taller towers supporting the centre. Each of the latter will be crowned by ornamental finials, the central ornamentation, flagstaffs, and the like imparting an exceptionally attractive appearance. The portion of the hall towards the Park is to be treated in a style conforming with that of the Industrial Hall. The architects are Messrs. Walker & Ramsay, of Glasgow. In all nine tenders had been received, seven from firms in Wolverhampton, and two from Birmingham firms. The committee decided to accept the lowest tender—that of Mr. J. Herbert, of Wolverhampton, for 7,297*l*. The erection of the most important of the Exhibition buildings has therefore now been arranged for, the only other building of considerable size to be yet settled being the concert hall, to be erected in the park. Of course there are a number of smaller structures, but they will be agreed upon later. Among these may be included the Japanese pavilion, the executive being in correspondence with the Japanese Government with a view to that nation being officially represented. Then there may be an Oriental section and an Indian section, to say nothing of side shows, cafés, bandstands, &c.

BRITISH FIRE PREVENTION COMMITTEE.—The Executive of the Committee have elected as foreign honorary corresponding members the following members of technical and fire-brigade professions abroad:—M. Bourdon, City Architect, Paris; Herr Reginald Czermack, President Austrian Fire Brigades' Association, Teplitz, Bohemia; Señor Fernandez, Inspector-General of Portuguese Fire Brigades, Oporto; M. Henri, Secretary International Fire Congress and Belgian Fire Brigades' Federation, Brussels; Herr von der Hude, President Architects' Association, Berlin; Herr A. Jaffe, Architect of International Fire Exhibition, Berlin; Count Kamarowsky, President International Fire Congress, Orel, Russia; Herr Kitner, Vice-President Royal Institute of Russian Architects, St. Petersburg; Herr von Lundt, Chief Officer Fire Brigade, Odessa; M. G. de Marie, President Luxembourg Fire Brigades' Association, Luxembourg; Herr Meyer, Chief Officer Fire Brigade, Copenhagen; Herr Ohlshausen, Superintendent of Buildings, Hamburg; and M. le Chevalier Papini, Chief Officer Fire Brigade, Milan.

EDUCATIONAL PROSPECTUSES.—The Principal of the Northern Polytechnic, in sending us a copy of the Prospectus for the session 1901-2, draws attention to the recent development of the day-school work. The institution has now four day schools open to boys and girls, one specialising in science, the other in technology (building trades especially); the other two are in subjects out of our province. In the engineering and metal trades and in the building trades department there appears to be every provision made for a complete technical training.——The Birkbeck Literary and Scientific Institution, which has just commenced its winter term, sends us the annual Prospectus and Report. As is well known, the Institution provides in its curriculum for the study of a great variety of subjects in literature, mental and moral science, and physics. During the recess improvements have been made in the arrangements of the building, partly as the result of a special donation of two thousand guineas from Mr. Francis Ravenscroft. The additions comprise a new reading-room, a magazine-room and study, and a tea-room; while in the basement space has been gained for a large metallurgical laboratory. A further increase in the appointments of the Institution has been made by the aid of an equipment grant from the County Council. This includes useful additions to the scientific apparatus in the departments of physics, chemistry, and mechanics, appliances for the art school, and models for building construction; and the departments of botany, geology, and zoology are now (thanks to this assistance) placed on a very efficient footing, and students will pursue their studies of these sciences under highly favourable conditions. Among the special subjects are included building construction, quantity surveying, and drawing.——The Glasgow and West of Scotland Technical College sends us its annual Prospectus and Report. The college occupies buildings scattered over a wide area and consequently difficult of inspection, and advantage has been taken of the Glasgow Exhibition to prepare an exhibit representative of the several departments, the collection being composed entirely of work done in the ordinary course of last session. At present the number of students has been increased to the utmost capacity of the buildings, and the curriculum has been extended in several directions. The subjects taught include natural philosophy, chemistry, technical chemistry, mechanics, and applied mathematics, machine design, steam and steam engines, civil engineering, electrical engineering, architecture, mining and geology, &c., &c.

A NEW GAS FIRE.—The Clumond Gas Radiator is a novel description of gas fire which is now being placed on the market by the Kern Burner Company. The fire is described in the current chapter of "The Student's Column." The company have just opened showrooms at Kern Buildings, Gravel-lane, Southwark, S.E., where fires or "radiators" of various sizes and designs may be seen. We have seen the new fire in action and strongly recommend intending purchasers of gas fires to inspect this novelty before investing in the old forms of gas fire. We should not, however, recommend the use of any of the radiators having less than ten tubes and a nominal consumption of 20 cubic ft. per hour, except for rooms of remarkably small area.

BRICKWORKS IN THE MARKET.—At the London Auction Mart, Tokenhouse-yard, on Wednesday, October 9, Messrs. Fuller, Horsey, Sons, & Cassell submitted for sale the freehold property known as the Eye Fletton Brickworks, situate at Eye Green, near Peterborough. The property, it was explained, had a total area of about 9½ acres, the whole of the land containing superior Fletton brick earth extending to a very considereble depth, the quantity being for all practical purposes inexhaustible. There was an abundant supply of water derived from a reservoir on the property. The buildings were of substantial construction and well arranged for the purposes of the business. The plant and machinery were entirely modern and capable of an output of about 200,000 bricks per week. The property was absolutely freehold, there being no tithe-rent charge, land-tax, or royalties payable. The only drawback to the works was the absence of a railway siding, but the railway company had agreed to construct one at a charge of 10 per cent. yearly interest on the necessary outlay. The bidding was started at 2,000*l*., and did not advance beyond 2,450*l*. The auctioneer said he could not sell at that price, and the property was accordingly withdrawn, private offers being invited.

THE ARTHUR CATES BEQUEST OF BOOKS.—The late Mr. Arthur Cates bequeathed his architectural library jointly to the Institute, to the Architectural Association, and to the Surveyors' Institution, the selection of volumes to be at the discretion of his executors. The bequest was, however, subject to Mrs. Cates' enjoyment of it during her life. Mrs. Cates has expressed the wish that the books should fulfil the useful purpose of the testator without delay; and the Architectural Association has now received some 130 works (besides many pamphlets). Among them are such books as "Monuments Anciens et Modernes," by Jules Gailhabaud; "Motifs Historiques," by César Daly; Neale's "Abbey Church of St. Albans;" Johnson's "Specimens of Early French Architecture;" Wicke's "Spires and Towers of Mediæval Churches of England;" "Fifteenth Century Italian Ornament," by Sydney Vacher; Burges' "Architectural Drawings;" Sharpe's "Architectural Parallels;" Richardson's "Architecture of England;" Durand's "Parallèle des Edifices;" "Architecture Civile et Domestique," by Verdier and Cattois; "Entretiens sur L'Architecture," by Viollet-le-Duc, as well as his great work the "Dictionnaire de L'Architecture Française" (11 volumes).

LEGAL.

REGENT-STREET BUILDING DISPUTE.

THE case of Mappin *v.* Liberty & Co. came before the Lord Chief Justice of England, sitting as Vacation Judge, on the 9th inst., on an application by the plaintiffs for an interlocutory injunction to restrain the defendants, in completing a vault or cellars, from tunnelling under the subsoil of Regent-street to the injury of the plaintiffs. The plaintiffs alternately alleged that the defendants, in constructing the work in question below their foundations, had not complied with the provisions of the London Building Act, 1894.

Mr. Bramwell Davis, K.C. and Mr. Pollock appeared for the plaintiffs; and Mr. Younger, K.C. and Mr. Rolt for the defendants.

At the conclusion of the arguments of counsel his Lordship in giving judgment said that upon the question of title the plaintiffs had not made out a strong *prima facie* case sufficient to justify him in stopping the defendants from carrying out the works in question. With regard to the point under the London Building Act, he did not think there was sufficient evidence to justify him in granting the injunction asked. In these circumstances the motion would stand till the trial, the costs to be costs in the action.

TORQUAY BUILDING DISPUTE.

THE case of the Torquay Hotel Company, Limited, *v.* Bell came before the Lord Chief Justice of England, sitting as Vacation Judge, on the 9th inst., on a motion by the plaintiff Company for an interim injunction to restrain the defendant until the trial from the erection of certain buildings.

Upon the case being called on, Mr. Edward Ford, for the defendant, stated that his client had, he thought, pulled down all that the plaintiffs could possibly object to, and he would undertake not to rebuild that portion, except that he would have to put slates on to cover in that portion of the building which was left.

Mr. Bramwell Davis, K.C., for the plaintiffs, said he could not agree that the defendant had taken down everything that the plaintiffs could object to.

His Lordship: It is better that the case should stand over till it is ripe to be heard.

Mr. Davis replied that he would not offer any objection to the motion standing over if the defendant would undertake in the terms of the notice of motion until the hearing.

His Lordship (to Mr. Ford): You say you think the defendant has pulled down what the plaintiffs can object to, and you will undertake not to rebuild that except to put slates on to cover in what is left.

Mr. Ford: Yes.

His Lordship: I think that is reasonable. The motion will stand over till the second motion day next sittings.

Order accordingly.

BUILDING DISPUTE AT EAST SHEEN.

THE case of the East Sheen Preservation Society *v.* The Urban District Council of Barnes came before the Lord Chief Justice of England, sitting as Vacation Judge, on the 9th inst., on an application by the plaintiffs to continue an injunction which his Lordship granted *ex parte* on the 5th inst.

When the case was called on his Lordship stated that he remembered the facts. The plaintiffs wished to prevent buildings at East Sheen from being used as a smallpox hospital.

Mr. St. John said he represented the defendants, and he asked that the motion might stand over in order to enable his clients to answer affidavits filed by the plaintiffs in support of the motion.

His Lordship (to Mr. St. John): You must not go on building in the mean time.

Mr. St. John: The building is finished, and I have not the least intention of going on further.

His Lordship: You must not use the place as a smallpox hospital.

Mr. St. John: The notice of motion does not say anything about that.

His Lordship (referring to the notice of motion) said he saw that the plaintiffs' application was that the defendants had not the right to build on the common.

Counsel for the plaintiffs said that if the motion stood over, he should ask that the defendants should undertake not to use the place as a smallpox hospital.

His Lordship: I have nothing to do with that on this motion. The case will stand over till the second motion day next sittings.

Order accordingly.

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RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

10,506.—A DRILL FOR DEEP BORING: *J. T. Wood, R. Wood and A. H. Wood.*—For vertical boring, a percussive and rotatory motion is imparted by either power or the hand, to a twisted drill, which is furnished with a point of hardened steel. As the hole becomes deeper, lengths of plain rod, having screwed or other socket joints, are added.

10,519.—WINDOW CASEMENTS: *E. Goddard.*—The casement is mounted upon pivots at its front, which are cast in one piece with channel bars that are affixed to the frame; sockets or eyes being also cast upon channel bars, which are secured to the casement-rails. When the casement is shut, the overlapping ribs of the channel bars will form a weather-tight joint, whilst a gutter or channel is drained through the sill by means of inclined apertures. In another form of the contrivance (which can be used for pivoted windows and fanlights) pivots and eyes are cast upon a window frame and casement made of metal.

10,522.—A MACHINE FOR DRILLING WOOD: *H. S. Broom and J. T. Wade.*—Drill spindles with pinions that gear with an inner gear-wheel upon a spindle are mounted upon a barrel, which is adjusted anglewise in a bearing and is to be locked with a set screw; the thrust of the spindles is taken by a disc upon the gear-wheel, which runs in a covered oil-bath; through the engagement of the set screw with holes in the barrel, the drills, which should be disposed in pairs, can be placed either vertically or horizontally, or at any intermediate angle with the work table.

10,527.—AN ANEMOMETER FOR USE IN COAL MINES: *J. Thompson.*—A cup in a chamber which contains petroleum oil or some other non-conducting liquid, sustains the lower bearing of the vertical spindle that is turned by hemispherical cups; a flange at the upper end of the spindle drops into an oil-cup in the steadying bearing; with the rotation of the spindle a cam will make and break contact alternately with a spring upon an insulating-block, whereby will be closed and opened an electrical current between two terminals on the outside of a sealed casing; the velocity of rotation is regulated with a bell, &c., in the circuit, so that one can calculate the velocity of the current and the amount of air per unit of time.

10,549.—A LIFT-VALVE: *N. N. Shaw.*—A recess in the valve takes an enlargement of the lower end of the quick-threaded spindle for which the cover serves for a nut. Another nut secures a reversible and renewable valve-disc to the valve, which has for its guide the vertical extension of the cover, whilst the amount of opening of the valve is indicated by means of a pointer upon the hand-wheel, a single turn of which completely opens the valve.

10,564.—TUBES FOR HOLDING PAINTS, OILS, LUBRICANTS, &C.: *Gerdom Kellogg Company.*—The containers or tubes are fashioned with corrugations and have winders or keys; they are made of thin metal strips corrugated centrically and having serrated ends for their pierced spouts or caps, the strips being soldered or folded into tubes.

10,595.—TREADS FOR FOOT-WAYS, STAIRS, &C.: *C. H. Wilkinson.*—These are made of a sheet of some soft metal or of leather, indiarubber, skin, or hide, with a backing of indiarubber, fibre, felt, or some similar material, secured with metallic wires which are set either straight or slant-wise so that their points shall be flush or may be ground flush with the surface.

10,606.—A FUSE-BOX (ELECTRICAL): *A. D. Smith.*—The fuse-box is devised for use in distributing to general consumers from one set of service cables. In the case of two circuits an insulating block having channels which are separated with ridges is fitted on to a box which has a glazed lid. The main is connected to a 'bus bar provided with terminals for the isolated fuse wires. There are openings for the conductors in the upper part of the box. Two 'bus bars are supplied for concentrical or similar mains.

10,609.—A DOOR-CLOSING APPLIANCE: *S. Hill.*—The appliance comprises a spring that shuts the door and a pneumatical check that will prevent it from being slammed; a lever is pivoted on to the door-frame and an air cylinder is affixed to the door, two chains join the piston to a drum, one of them being attached to the inner or piston-end, and the other to the outer end, of the piston-rod, to the end of the lever on the door-frame is pivoted a lever which is secured to the axis of the drum; the opening of the door draws in air by a piston through a valve, but as the door is being closed through the working of a spiral spring the escape of the air behind the piston through a small vent-hole beneath a screw controls its movements; the specification extends to other rearrangements of the cylinder and links.

10,637.—ELECTRICAL RESISTANCES: *A. H. Mayes.*—Conducting plates, between which is placed some pulverulent resistant material are secured within a non-conducting box beneath non-conducting pressure plates, grooves (filled with mica or asbestos paper packing) in the box take the corrugated copper conducting plates, and it has lugs for its lid and holes for the binding-screws. The pressure-plates and the box and its lid may be made entirely of slate or earthenware, or of metal covered with an insulating material. Brackets upon the back of a switch-board will carry the box, the terminals being joined to the contact-studs of a common switch.

10,680.—A FASTENING FOR GATES: *H. Swiers.*—An automatic fastening or catch is formed with a loop upon a bar, which is passed through slots in a plate upon the gatepost. Upon the under side of the plate is a spring-catch that will, when the gate is open, keep the loop raised. As the gate is being shut it works a push upon the spring, and so disengages the loop from the catch, whereupon the loop will drop down over the head of the gate and so fasten it; or a crook or bent piece may be employed instead of a loop, having a handle and being set for engagement with one of the gate-bars.

10,714.—CONFIGURATION OF DRAIN-PIPES, GULLIES, CHANNELS, &C.: *D. Read.*—The pipes, chutes, interceptors, and so on are fashioned with an egg-shaped section, having a semicircular curve above and an elliptical curve below, and squared supports, with jointing sockets oval in section.

10,716.—PLIERS: *H. A. Deiters & E. L. Bill.*—The pin on to which one jaw is pivoted may be varied as to its position with respect to the other jaw by the turning of an eccentric in the latter jaw, and securing it by a plate with a pin that will enter into a series of holes. The eccentric, which may be either stepped or have lugs that fit a groove in the latter jaw, will enable one to apply the jaws as may be required on to the work.

10,730.—MEANS OF ESCAPE FROM FIRE: *C. R. Harris.*—The inventor devises a rope ladder that can be wound upon a reel and stowed in a case beneath the window sill, it is to be liberated for use by pressing a button that disengages the catch of the door of the case or box, a spring opens the door and the reel will then roll down the bottom, which is sloped, of the box.

10,752.—A CRANE FOR USE BY BUILDERS AND OTHERS: *J. Davie and J. Weir.*—Spans which are passed around pulley-blocks and are wound in opposed directions upon a drum serve to slew the derrick about its support upon a post or mast, the blocks are attached to projections from the head of the post, and worm-gearing turns the drum.

10,763.—SLIDING GATEWAYS, PARTITIONS, &C.: *I. Wishart.*—The sections are hinged on the outside and inside, alternately, so that one can cause them to slide and fold together. Every other section has wheels or rollers at its base with middle flanges that move between guide rails, and rollers at the top, similarly guided; the top rollers have roller bearings, and the bottom wheels revolve upon roller bearings on spindles carried by swivelling spheres or forks moving within ball-shaped casings.

10,778.—ARTIFICIAL STONE GOODS: *L. Schreyer.*—For casting goods made of artificial stone or a marble composition the inventor discards the customary polished glass moulds for sheet metal moulds, which he lines internally with a thin layer of a leaden silicate and (it may be) a vitreous enamel.

10,788.—MAKING OF WIRE FENCING: *W. McCloskey and J. Kay*—For retaining the horizontal wires in their places whilst one weaves them with the vertical wires is used a spacing-bar. The wires will rest upon cranked pins of the spacing-bar, a pivoted lever or jaw held with a catch at the top of the bar grips the top wire together with the end of the vertical wire that is being interwoven, a shoulder upon the lower end of the bar lies upon the lowest horizontal wire.

10,865.—TILES FOR ROOFS, WALL-LININGS, &C.: *P. Sohége.*—The tiles or sheets are composed of an admixture of tan waste or bark, waste hemp, gelatinous size, alum, resinous soap, sand, and pulverised pumice-stone; an addition of 1 per cent. of tannic acid will precipitate the gelatine and serve for an antiseptic. After having been subjected to a high pressure the goods are dried, and then made waterproof with a solution of stearic acid 5 parts and pine resin 12 parts, heated to 100 deg. C.

10,895.—SPIGOT-AND-SOCKET JOINTS: *R. Ewing.*—An annular shoulder is fashioned upon the socket, with its raised portion, saddle, or rest at the lowest part in order to ensure an even and smooth invert; if liquid cement is used the grouting material is poured through holes in the shoulder, the cement being held by an annular shoulder (of which the lower part constitutes a saddle) formed around the rim of the socket.

10,921.—TREATMENT OF SEWAGE: *C. Lehmann and F. Neumeyer.*—The sewage is conveyed into an air-tight receiver which is joined with a bent pipe to a vessel which (together with the receiver) is connected to a tank by pipes for the passage of the evolved gases, for which an ultimate escape is provided; the tank is partly filled with glycerine. Before the treatment is begun, the air-tight container is filled with water. There are pipes for emptying the vessels, and for indicating when the sludge has reached the highest levels.

MEETINGS.

FRIDAY, OCTOBER 11.

Architectural Association.—Annual general meeting; Address by the President, Mr. W. H. Seth-Smith, and Distribution of Prizes, Medals, and Certificates. 7.30 p.m.

Glasgow Architectural Craftsmen's Society.—Opening Address by the President, Mr. J. M'Kissack.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Spinks on "Calculations, Measurements, and Plans and Sections." 7 p.m.

SATURDAY, OCTOBER 12.

British Institute of Certified Carpenters.—Visit to Lloyd's Registry Offices, Fenchurch-street, E.C. 3 p.m.

Northern Architectural Association.—An excursion meeting. Members to assemble at the Newcastle Breweries Offices, Haymarket, at 3 p.m.; after inspecting these buildings, the Electric Power Station will be visited.

MONDAY, OCTOBER 14.

Clerks of Works Association.—Monthly meeting, Carpenters' Hall. 7.30 p.m.

TUESDAY, OCTOBER 15.

Architectural Association.—Preliminary meeting of the School of Design. Addresses will be delivered by Mr. J. Macvicar Anderson and Mr. H. H. Statham. 7 p.m.

WEDNESDAY, OCTOBER 16.

Builders' Foremen and Clerks of Works' Institution.—Quarterly meeting of the members. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Spinks on "Sanitary Appliances." 7 p.m.

THURSDAY, OCTOBER 17.

Carpenters' Company, London Wall (Lectures on Sanitary Building Construction).—Mr. Mark H. Judge on "Sanitary Architecture." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Spinks on "House Drainage." 7 p.m.

FRIDAY, OCTOBER 18.

Architectural Association Discussion Section.—Mr. H. G. Collins on "Stables and Stable Fittings." 7.30 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

	£ s. d.		
BRICKS, &c.			
Hard Stocks	1 14 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 11 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 6	,,	at railway depôt.
Red Wire Cuts	1 14 6	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 4 6	,,	,, ,,
Do., Bullnose	4 9 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 2 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glased Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glased Stretchers and Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glased	2 0 0	,,	less than best.
	s. d.		
Thames and Pit Sand	7 3	per yard, delivered.	
Thames Ballast	6 0	,, ,,	
Best Portland Cement	34 6	per ton, delivered.	
Best Ground Blue Lias Lime	25 6	,, ,,	
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.			
Grey Stone Lime	12s 6d.	per yard, delivered.	
Stourbridge Fire-clay in sacks, 28s. od.		per ton at rly. dpt.	
STONE.	s. d.		
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.	
Bath ,,	1 7	,, ,,	
Farleigh Down Bath	1 8	,, ,,	
Beer in blocks	1 6½	,, ,,	
Grinshill ,,	1 10	,, ,,	
Brown Portland in blocks	2 2	,, ,,	
Darley Dale in blocks	2 1½	,, ,,	
Red Corsehill ,,	2 5	,, ,,	
Red Mansfield ,,	2 4½	,, ,,	
Hard York in blocks	2 10	,, ,,	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt	
,, ,, 6 in. Rubbed Ditto	3 0	,, ,,	
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,	
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,	
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt	
,, ,, 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
,, ,, 3-in. do.	1 2½	,, ,,	

[See also page 327.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Isolation Hospital	Bexhill U.D.C.	25*l.*	Nov. 23
*Isolation Hospital	Burslem Corporation	100*l.* and 50*l.*	Dec. 30
*Proposed Cathedral (Liverpool)	The Committee	Not stated	Jan. 1
Schools, Blyth	Cowpen (N'umbrlnd) U.D. Sch. Bd.	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Making-up Roads	Beckenham U.D.C.	John A. Angell, Surveyor, Beckenham	Oct. 14
Cast-iron Pipes, &c.	East Dereham (Norfolk) U.D.C.	B. H. Vores, Council Offices, East Dereham	Oct. 15
Street Works, Park Mews	Dover Town Council	H. E. Stilgoe, Civil Engineer, Town Hall, Dover	do.
Twelve Houses, Llwynpia, Rhondda Valley	Pontrhondda Building Club	W. C. Pritchard, Glamorgan Coal Company's Office, Llwynpia	do.
Sewage Works, Cotherstone, Durham	Startforth R.D.C.	J. E. Parker, C.E., Post Office Chambers, Newcastle-on-Tyne	do.
Thirteen Houses, Jackson-street, Carlisle		Johnstone Bros., Architects, 30, Lowther-street, Carlisle	do.
Walls, &c.	Kendal Town Council	R. H. Lucas, Civil Engineer, Town Hall, Kendal	do.
Concrete Foundations	Bournemouth Town Council	F. W. Lacey, Civil Engineer, Town Hall, Bournemouth	do.
Water Supply Works	Cannock (Staffs) R.D.C.	R. E. W. Berrington, Engineer, Wolverhampton	do.
Sewering, Back Hope-place	Keighley Corporation	W. H. Hopkinson, Civil Engineer, Town Hall, Keighley	do.
Road Improvement Works, Midland-road	Wellingborough U.D.C.	E. Sharman, Surveyor, Market-square, Wellingborough	do.
Wood Paving Works	Northfleet (Kent) U.D.C.	S. Honeycombe, Surveyor, The Hill, Northfleet	do.
Rebuilding the Station Inn, Keighley	Midland Railway Company	Milnes & France, Architects, 99, Swan-arcade, Bradford	do.
Bricks (50,000)	Belfast Corporation	Sir S. Black, Town Hall, Belfast	do.
Sewer, Leslie-road	Aberdeen Town Council	W. Dyack, Burgh Surveyor, Town House, Aberdeen	do.
*Victoria Stone Paving	Tottenham U.D.C.	W. H. Prescott, 712, High-road, Tottenham	do.
Sewerage Works, Coulsdon	Croydon R.D.C.	Chart, Son & Reading, Union Bank Chambers, Croydon	Oct. 16
Sewerage Works, Mitcham	do.	do.	do.
Road Works, Ordnance-place, Chatham	Watt's Charity Trustees	J. W. Nash, Surveyor, Rochester	do.
Road Metal (2,000 tons)	Ebbw Vale U.D.C.	T. Hughes, Council Offices, Ebbw Vale	do.
Wood Paving, &c., Alexandra-street	Southend-on-Sea Corporation	A. Fidler, Civil Engineer, Town Hall, Southend-on-Sea	do.
Road Works, Onslow-gardens, &c., Wallington	Croydon R.D.C.	R. M. Chart, Surveyor, Town Hall, Croydon	do.
Additions to Isolation Hospital, Beddington Corner	do.	R. M. Chart, Surveyor, Fell-road, Croydon	do.
Lodge, &c., St. George's Park	Bristol Corporation	T. H. Yabbicom, Civil Engineer, Queen-square, Bristol	do.
Street Works, Walton-road, &c.	Ilkley U.D.C.	The Surveyor, Council Offices, Ilkley	do.
Sewage Disposal Works, Barlby	Riccall (Yorks) R.D.C.	E. J. Silcock, Civil Engineer, 10, Park-row, Leeds	do.
Parish Room, Walton, Suffolk	Rev. E. Symonds	H. J. Wright, Architect, 4, Museum-street, Ipswich	do.
Road Works, Dover-street, &c.	Reading Town Council	J. Bowen, Borough Engineer, Town Hall, Reading	do
Restaurant, &c.	Cork International Exhibition Co.	H. A. Cutler, Civil Engineer, Municipal Buildings, Cork	Oct. 17
Paving Works, Moor-street, &c.	Luton Town Council	G. Sell, Town Hall, Luton	do.
School, &c.	Clay Cross School Board	Rollinson & Son, Architects, 13, Corporation-street, Chesterfield	do.
House, &c., Sea Houses, North Sunderland	Mr. Jas. Young	G. Reavell, jun., Architect, Alnwick	do.
Earthenware Drain Pipes	Croydon Corporation	Borough Engineer, Town Hall, Croydon	do.
Road Works	Cork County Council	J. J. McCarthy, Court House, Cork	do.
Additions to Hospital	Ballymahon (Ireland) Guardians	P. MacGreevy, Workhouse, Ballymahon	do.
Stables, &c., Crown Hotel, Southwold	Colchester Brewery Co., Ltd.	G. H. Page, Architect, Trinity Chambers, Colchester	do.
Underground Convenience, &c., Market Place	Hull Corporation	A. E. White, Civil Engineer, Town Hall, Hull	Oct. 18
Cast-iron Water Pipes	Preston Corporation	Borough Engineer, Town Hall, Preston	do.
Additions to Schools	Cardiff School Board	E. W. M. Corbett, Architect, Castle-street, Cardiff	do.
Re-building Workhouse	Newry (Ireland) Guardians	J. Brown, Architect, Newry	Oct. 19
Six Houses, Brynoch	Neath Main Colliery Co.	J. Cook Rees, Architect, Neath	do.
Schools, Pontlottyn	Gelligaer School Board	James & Morgan, Architects, Charles-street Chambers, Cardiff	do.
Cast-iron Pipes (21 tons)	Coventry Corporation	J. E. Swindlehurst, Civil Engineer, St. Mary's Hall, Coventry	do.
Drainage Works at Hospital	Londonderry Guardians	M. A. Robinson, Civil Engineer, Richmond-street, Londonderry	do.
*Barging Away and Disposal of Rubbish	Metropolitan Borough of Stepney	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	do.
*Car Shed and Workshops	Middleton Electric Traction Co.	Secretary, Donington House, Norfolk-street, Strand, W.C.	Oct. 21
Paving, Kerbing, &c., Hoddesdon	Hertfordshire County Council	County Surveyor, 41, Parliament-street, S.W.	do.
Retaining Wall, &c.	Radcliffe (Lancs) U.D.C.	W. L. Rothwell, Surveyor, Council Offices, Radcliffe	do.
Cement, Pipes, &c.	Great Western Railway Co.	G. K. Mills, Paddington Station, W.	do.
Additions to Board Room Offices, &c., Armley	Bramley Guardians	P. Robinson, Architect, 72, Albion-street, Leeds	do.
Schools, Newquay, Cornwall	St. Columb Minor School Board	J. Pearce, 1, Lehenver-villas, Newquay	do.
Water Pipes	Ramsgate Corporation	W. A. M. Valon, Engineer, Town Hall, Ramsgate	do.
Road Metal, &c.	Sheerness Town Council	T. F. Berry, Surveyor, Trinity-road, Sheerness	do.
Public Library, &c., Eastbourne	Technical Instruction Committee	W. C. Field, Borough Surveyor, Town Hall, Eastbourne	do.
Street Works, Brand-street, Glasgow	Clyde Navigation Trustees	W. M. Alston, Engineer, 16, Robertson-street, Glasgow	do.
*Roadmaking Works	Bromley U.D.C.	Surveyor, District Council Offices, Bromley, Kent	Oct. 22
*Artizans' Dwellings, Plaistow	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	do.
*Additions to Hospital	Willesden District Council	O. Claude Robson, Engineer, Dyne-road, Kilburn	do.
*Open Shed, Steel Joists and Concrete Roof	Hammersmith Council	Borough Surveyor, Town Hall, Hammersmith	Oct. 23
*Additional Wing to Asylum	Cambridgeshire, &c., Asylum	A. P. MacAlister, Architect, 20, St. Andrew's-street, Cambridge	Oct. 24
*Enlargement of Head Post Office, York	Commissioners of H.M. Works, &c.	H.M. Office of Works, Storey's Gate, S.W.	Oct. 25
Sewerage Works (Contract No. 3)	West Hartlepool Corporation	J. W. Brown, Borough Engineer, West Hartlepool	do.
*Enlargement of Head Post Office, Derby	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, Storey's Gate, S.W.	do.
Sewers, &c.	Newhaven (Sussex) U.D.C.	F. J. Rayner, Town Surveyor, Newhaven	Oct. 28
*Drainage Works	Gosport and Alverstoke U.D.C.	R. St. George Moore, Civil Engineer, 17, Victoria-street, S.W.	do.
*Car Shed, Workshops and Offices, Northfleet	British Electric Traction Co., Ltd.	Chief Engineer, Donington House, Norfolk-street, W.C.	do.
*Sub-District Post Office, West Kensington	Commissioners of H.M. Works	H. Tanner, H.M. Office of Works	Oct. 29
Steam Disinfector, &c.	Bethnal Green Guardians	Steward's Office, Bishop's-road, Bethnal Green, N.E.	do.
*Iron Escape Staircase	Brentford Union	Clerk to Guardians, Union Offices, Isleworth, W.	do.
*Artificial Stone, Granite Kerbing, &c.	Middlesex County Council	County Engineer, Guildhall, Westminster	Nov. 1
*Isolation Hospital	Chiswick U.D.C.	A. Ramsden, Surveyor, Town Hall, Chiswick	Nov. 6
*New Public Offices, Westminster	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, Storey's Gate, S.W.	Nov. 12
Eight Scullery Houses		— Harrison, 102, Bankside-street, Roundhay-road, Leeds	No date
Setts, &c.	Manchester Corporation	Borough Surveyor, Town Hall, Manchester	do.
Kilns, Chimneys, &c., Morley, near Leeds	Morley Main Fireclay Works	W. Ackroyd & Bros., Limited, Morley	do.
Water Supply Works, Dyce Manse, Aberdeen		Davidson & Garden, 12, Dee-street, Aberdeen	do.
Road Works, Elm Farm Estate, Aldershot	Mr. R. Simmonds	Friend & Lloyd, Architects, Grosvenor-road, Aldershot	do.
Stabling, &c., Ship Inn, Harrogate	Mr. Jos. Whitworth	H. E. & A. Bown, Architects, James-street, Harrogate	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Surveyor and Engineer	Bilston U.D.C.	200*l.*	Oct. 19
*Assistant Waterworks Inspector	Colombo Waterworks	2,400 Rupees per annum, &c.	do.
*Inspector of Nuisances	Aylesbury R.D.C.	175*l.*	Oct. 23
*Temporary Architectural Assistant	Wolverhampton Corporation	3*l.* 3*s.* per week	No date
*Land Surveyors (several)	Land Registry	140*l.* per annum	do.
*Assistant Lecturer, &c., in Building Construction	Wandsworth Technical Institute	Not stated	do.
*Carpenter	Lagos Government	200*l.*	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv.* *Contracts, pp. iv. vi. viii. x. & xxiv.* *Public Appointments, pp. xxi. & xxiv.*

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PRICES CURRENT (*Continued*).

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.	
,, best seconds ,,	10 15 0	,,	,,
16× 8 best ,,	6 2 6	,,	,,
20×10 best blue Portmadoc	10 18 0	,,	,,
16× 8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green	11 2 6	,,	,,
16× 8 ,, ,,	6 15 0	,,	,,
20×10 Permanent green	10 0 0	,,	,,
16× 8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt	
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine— First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 14 0	0 16 6
6 in. at 6d. per square less than 7 in.		

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

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Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

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	Per ton, in London. £ s. d.	£ s. d.
IRON.— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised (* And upwards, according to size and gauge.)	16 0 0	- - -
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d
LEAD—Sheet, English, 3 lbs. & up.	14 12 6	- - -
Pipe in coils	15 2 6	- - -
Soil Pipe	17 12 6	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,, ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
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,, ,, fourths	2¾d.	,, ,,
21 oz. thirds	3¼d.	,, ,,
,, ,, fourths	3¾d.	,, ,,
26 oz. thirds	5d.	,, ,,
,, ,, fourths	4¼d.	,, ,,
32 oz. thirds	6d.	,, ,,
,, ,, fourths	5¼d.	,, ,,
Fluted sheet, 15 oz.	3½d.	,, ,,
,, ,, 21 ,,	4½d.	,, ,,
½ Hartley's Rolled Plate	2¾d.	,, ,,
⅜ ,, ,, ,,	3¼d.	,, ,,
½ ,, ,, ,,	3¾d.	,, ,,

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Raw Linseed Oil in pipes per gallon	0 2 9
,, ,, ,, in barrels ,,	0 2 10
,, ,, ,, in drums ,,	0 3 0
Boiled ,, ,, in pipes ,,	0 2 11
,, ,, ,, in barrels ,,	0 3 0
,, ,, ,, in drums ,,	0 3 2
Turpentine, in barrels ,,	0 2 3
,, in drums ,,	0 2 5
Genuine Ground English White Lead ...per ton	22 0 0
Red Lead, Dry ,,	22 10 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 10 0

VARNISHES, &c.

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Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

W. E. W. (Below our limit).

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* Denotes *accepted*. † Denotes *provisionally accepted*.

BOWNESS-ON-SOLWAY.—For the erection of a concrete wall for the Wigton Rural District Council. Mr. W. Brown, Surveyor, Council Offices, Wigton:—
Ormerod & Son, Close-street, Carlisle* £120

CARDIFF.—For the erection of a residence, Caeran, Cardiff, for Sir E. S. Hill, K.C.B. Mr. G. E. Halliday, architect, Cardiff. Quantities by Mr. John W. Rodger, surveyor, Cardiff:—

Cox	£3,350 0 0	F. Couzens & Co.	£2,698 0 0
Shepton & Sons	3,086 0 0		
Thomas & Sons	2,895 0 0	Britton	2,660 0 0
Evans Bros.	2,887 7 0	Cadwallader, Cardiff*	2,600 0 0
G. Couzens & Co.	2,737 7 6	Bevan	2,431 0 0

CARDIFF.—For additions, &c., to parish church, St. Bride's-super-Ely, for the Rev. J. Sinnett-Jones. Mr. G. E. Halliday, architect, 14, High-street, Cardiff. Quantities by Mr. J. W. Rodger, surveyor, 14, High-street, Cardiff:—

Edward Lewis	£519 8 6	Harris & Davies, Peterston-super-Ely*	£342 5 0
Thomas & Son	479 0 0		
Morris & Thomas	369 0 0		

CARDIFF.—For additions to schools, Maindy, for the Llandaff School Board. Mr. G. E. Halliday, architect, 14, High-street, Cardiff. Quantities by Mr. John W. Rodger, surveyor, Cardiff:—

W. Cox	£1,489 12 10	Cadwallader	£1,290 0 0
Blacker Bros.	1,430 0 0	Thomas & Son	1,280 0 0
Shepton & Son	1,315 0 0	C. C. Dunn	1,230 0 0
Symonds & Co.	1,303 18 0	Couzens & Co., Cardiff*	1,187 0 0

CARRICKMINES (Co. Dublin) — For the erection of a dwelling-house and stable in steel and concrete. Messrs. Clare & Ross, architects, 1, West-street, Finsbury-circus, E.C., and Chelmsford:—

R. E. Mellon	£2,144	A. Frazer, Bray, (accepted after amendment)	£1,900

CHELSHAM.—For fitting-up the bar of the Bull Inn. Messrs. Chart, Son, & Reading, architects, Croydon:—

Smith & Sons	£153 10	W. L. Simpson, Camberwell*	£130 0

COULSDON.—For the erection of a house and shop, Lion Green, Coulsdon. Messrs. Chart, Son, & Reading, architects, Croydon:—

E. J. Burnand	£1,200	H. Bacon	£1,056
G. Cheeseman	1,165	Smith & Son	978
V. Cook	1,135	G. Goulder, Croydon*	945

CROYDON.—For the erection of five houses and shops, Lower Church-street, Croydon. Messrs. Chart, Son, & Reading, architects, Croydon:—

Truett & Steel	£3,079 0	Smith & Son	£2,698 0
Bacon, H.	3,034 10	Stewart & Sons	2,612 0
Burnand, E. J.	2,956 0	C. Waller, Croydon*	2,548 0
Goulder, G.	2,875 0		

DEVONPORT.—For alterations to the Foresters' Arms, Duke-street, for Mr. C. Jessep. Mr. Edgar M. Leest, architect, Devonport:—

A. Truscott	£198 7 5	Jenkin & Son	£187 0 0
Healy & Son	192 0 0	Smith & Son	172 15 0
T. May	188 0 0	W. J. Oliver*	158 12 6

HASLEMERE (Surrey).—For the erection of a pair of shops with dwelling-houses. Messrs. Clare & Ross, architects, 1, West-street, Finsbury-circus, London, E.C., and Chelmsford:—
W. Ranson, Haslemere* £1,197

[*See also next page.*

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KILLYBEGS (Donegal).—For the erection of a house, for Mrs. M. T. MacGinley. Mr. E. J. Toye, architect, Strand, Londonderry:—

Daniel McCaffery, Strabane, co. Tyrone*.. £1,907

LONDON.—For alterations at the Mitre Hotel, Tooting. Messrs. Chart, Son, & Reading, architects, Croydon:—

Burges & Sons ..... £750 | Keys, Tooting* £695

LONDON.—For repairs at the Clifton Arms, Norwood. Messrs. Chart, Son, & Reading, architects, Croydon:—

Bacon	£159 0	Akers & Co.	£143 0
Smith & Sons	150 0	Goulder, Croydon*	138 15

MITCHAM.—For alterations and repairs at the White Hart Hotel. Messrs. Chart, Son, & Reading, architects, Croydon:—

J. B. Potter.....	£855	F. J. Shopland,	
Jones & Son	848	Sutton*	£725

MITCHAM.—For the erection of frising shop and hide store at the Eagle Leather Works. Messrs. Chart, Son, & Reading, architects, Croydon:—

Smith & Son	£895	H. Bacon, Thornton	
J. Baker	818	Heath*	£655
E. J. Burnand	708	J. Dean.....	614

NEWMARKET.—For pumping machinery, for the Rural District Council. Mr. F. S. Courtney, engineer, Broad Sanctuary Chambers, Westminster:—

Dixon & Fish	£2,500 15 0	Dodman.....	£1,419 10 0
Pollock, White, & Co.....	2,427 0 0	Renshaw & Co.	1,297 10 0
		Easton & Co.	1,295 0 0
The Lighting Corporation	1,951 19 7	G. F. Jessop*	1,168 0 0
R. Warner....	1,535 0 0	Fielding & Platt, Worthington	informal
D. Young ...	1,590 17 0		

NORTHALLERTON.—For the erection of house, cottage, and stabling, Thirsk-road, for Mr. John Walker. Mr. Frank R. White, architect, Northallerton. Quantities by architect:—

Brickwork, Masonry, Carpentry, Joinery, Slating, Plastering, and Painting.

D. Oakley, Northallerton..... £3,346

Smith's and Ironwork, Plumbing and Glazing.

R. Jameson, Northallerton £615

NOTTINGHAM.—For the erection of a warehouse in rear of Short Hill, Nottingham, for Mr. L. O. Trivett. Mr. Hedley J. Price, architect and surveyor, 24, Low Pavement, Nottingham:—

Kerry & Co.....	£2,950	Wm. Maule	£2,849
J. G. Short	2,927	T. & W. Lee.....	2,835
Dennett & Ingle	2,895	Wm. Crane	2,752
R. Fisher	2,891	Fredk. Messom*	2,690
G. A. Pillatt	2,880		

[All of Nottingham.]

NOTTINGHAM.—For the erection of livery stables, Talbot-street and Wollaton-street, Nottingham, for the Nottingham Real Estate Investment Company, Limited. Mr. Hedley J. Price, architect, 24, Low Pavement, Nottingham:—

J. Wright.....	£3,520 0	Williamson & Co.	£3,150 0
T. Barlow	3,475 0	Dennett & Ingle	3,145 0
Vickers, Limited	3,474 0	G. A. Pillatt	3,097 0
R. Fisher.....	3,396 10	A. E. Smith	3,050 0
Cooper & Son....	3,290 0	J. G. Short.....	3,027 0
Hutchinson & Son	3,270 0	W. Maule	3,010 0
F. Messom	3,218 0	Crane, Limited..	2,933 0
J. J. Adams	3,150 0	T. Long*.....	2,890 0

[All of Nottingham.]

READING.—For the erection of a lodge and swimming-bath, for the Corporation. Mr. J. Bowen, C.E., Town Hall, Reading:—

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H. W. Godwin	£7,399 0 0	McCarthy E. Fitt	£5,655 0 0
Collier & Catley	6,550 0 0	H. Hill, Maidenhead* ..	4,627 0 0
Pattinson & Sons.....	6,169 0 0		

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H. Searle	£1,397 0 0	Collier & Catley	£1,294 11 0
J. Dixon	1,377 12 10	Lewis & Bros.	1,240 0 0
H. W. Godwin	1,342 0 0	McCarthy E. Fitt, Reading*	1,234 0 0
Pattinson & Sons	1,301 0 0		

SOUTHBOROUGH (Kent).—For the erection of a chapel and cottage at Cemetery, for the Urban District Council. Mr. William Harmer, surveyor, 137, London-road, Southborough. Quantities by surveyor:—

H. Whibley ..	£1,900 0 0	Beale & Son	£1,220 0 0
C. J. Gallard	1,492 0 0	J. Marshall ..	1,205 0 0
Gam & Co. ..	1,380 0 0	Crates & Son	1,179 0 0
Martin & Co.	1,300 0 0	Punnett & Son	1,175 0 0
K. C. Jarvis..	1,240 0 0	T. Potter, South-borough* ..	1,172 8 10
Tapner & Co.	1,235 0 0		
Leney & Son	1,228 0 0		

SUNDRIDGE.—For repairs at the White Horse Inn. Messrs. Chart, Son, & Reading, architects, Croydon:—

Aves.....	£272 5	Canfield	£211 15
Hodges	229 15	Goulder, Croydon*	117 10

WARE.—For the erection in steel and concrete of a gardener's cottage. Messrs. Clare & Ross, architects, 1, West-street, Finsbury-circus, E.C., and Chelmsford:—

Norris & Son	£656	F. Johnson	£430
F. Hitch	645	Clare Bros., Stratford*	397
Foster & Dickse	490		

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Artisans' Wages at Home and Abroad.

ALL parts of the civilised world are now brought into such close connexion by the advance of applied science that it becomes more and more important for each country to know the conditions of others, for unless we are acquainted with the facts relating to other nations it is impossible to form an opinion either on the progress or condition of Great Britain. The Foreign Labour Statistics, therefore—the second volume* of which is now published by the Board of Trade (why, by the way, are we not furnished with Colonial statistics?)—imperfect though they are at present, have a great deal of importance, for they enable us to form some kind of opinion on the state of labour in foreign countries. "Great caution," says Mr. Bateman in his introductory letter, "must be exercised in making comparisons between the figures for one country and another." This warning is true in regard to the comparison of most figures, but, bearing it in mind, we may at any rate come to some conclusions on the position of labour in foreign countries. It has also to be remembered that high wages or low wages are not always synonymous with the prosperity or the bad fortune of the artisan. The artisan who is best off is he who can obtain the greatest net return, or, it may be called, the most cash after paying for dwelling, food, and clothing.

Bearing these cautions in mind, let us take as far as is possible the earnings of bricklayers in foreign countries. Referring to these in the order in which they are given in the Board of Trade return, we find that a bricklayer and mason earns in Norway 4s. 3½d. per day; in Denmark, 4s. 1½d.; in Altona, the only place in the German Empire from which there is a return, 5s. 7d.; in Belgium (Brussels), 3½d. an hour; in France, 5s. 0½d. per day; in Switzerland, 3s. 5½d. It is somewhat surprising that the German statistics are so meagre, and in view not only of the spread of Socialism, but also having regard to the competition with this country, it would be most interesting and important to have fuller figures.

When we come to the United States we find a complete table, a table showing rates of wages which are startling. Thus in New York in 1898 the average daily wage of a bricklayer was 16s. 8d., of a mason 16s. 8d., and of a hod carrier 10s. In Philadelphia the same men earned 11s. 6½d., 11s. 5½d., and 8s. 4d. respectively. When we go further west to Chicago, we find the average earnings are for the first two classes 16s. 8d., for hod carriers 8s. 4d. It is pretty clear from the figures in these interesting tables that wages in the United States are to a large extent fluctuating and local, the higher rate in New York and Chicago as against Philadelphia and Baltimore being caused by a demand for bricklayers owing to constant and large building operations. But when we have these figures before us, it is clear why the United States absorbs all the best of our emigrants, since even the ordinary labourer—the hodman—can in New York earn the fine wages of 3*l.* a week, or 150*l.* a year. Though the cost of clothes and house rent is high in New York, it is not so extravagant as not to leave the workman in the United States with more money in his pocket at the end of a week after he has paid for the necessaries of life than in Great Britain; and in addition he has the use of a first-rate system of free public elementary education so that his children have as good a start as those of his employer, and he has likewise a vast and increasing supply of free public libraries, not regarded, as in this country, as burdens on the ratepayers, but as a necessary and desirable element in the social system. Let us add, too, that in every single city of the United States there is an abundance of cheap and quick means of locomotion, tramways radiating in every direction, and it is clear, so far as it is possible to judge, that in the United States at the present moment the lot of the artisan is extremely fortunate.

If we turn now to the English statistics—still observing the same trades—we may take the London district, which we may reasonably consider corresponds as nearly as may be with New York, because both are vast towns, in both there is a great growth of buildings, and in both house rent is high. In the London district then we find that in 1900 the standard rate of wages for a bricklayer was 10d. per hour for a week of fifty hours in summer—in other words, 2*l.* 1s. 8d. a week; or, in order to make the comparison with other countries more exact, and taking each day as of the same length, an average wage of 6s. 11¼d. per day, or, let us say, 7s. It would be extremely interesting to know, though this seems to be at present impossible, how much of the New York bricklayer's wages is expended in house-rent, but when we bear in mind that he receives more than double the wages of an English bricklayer, his position must be distinctly the better. The English artisan here has now free education, an addition to his pocket which has certainly in the last few years greatly improved his lot and taken—at any rate, from the prudent workman—a considerable load of anxiety, since, whether trade be bad or good, and employment be brisk or slow, his children can still receive their education. The hodman, who we suppose in England is classed under the head of labourer, in the London district is paid 7d. per hour, which for a week of fifty hours represents 27s. 6d. per week, or 4s. 7d. per week more than the bricklayer earns in Norway or Denmark, nearly as much as he receives in France, and a great deal less than he would earn on the other side of the Atlantic. But we must again repeat that mere cash receipts alone are not the sole element to be regarded, and there is always this in favour of the English workman, that, in spite of short winter days, the open winters of these islands render his lot more favourable, since the time for which he is thrown out of work is probably, on the average, less than in any other country, European or American.

* "Second Abstract of Foreign Labour Statistics." Board of Trade Labour Department. 1901.
"Report on the Standard Time Rates of Wages in the United Kingdom in 1900. With Comparative Tables." Board of Trade Labour Department. 1900.

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Having taken the London rate, it is unnecessary to go into details as regards other centres, though we may note in passing that the rate, both in Liverpool and Birmingham, for bricklayers, is 9½d. per hour, and we take it that the chief factor in regulating wages is the cost of house rent, because clothes and provisions are pretty much the same all over the United Kingdom. If this be so, then we may also take it, so far as Europe is concerned, that the net receipts of a bricklayer do not greatly vary, but that in the United States the net receipts are, even allowing for much higher rate, certainly greater. When, however, we find that the average cash wages per week in the Midland Counties of an agricultural labourer in 1899 were 14s. 2½d., and that the same man, if strong and sober, could as a bricklayer's labourer in a town earn very nearly double that sum, and when we remember the various minor advantages of the towns, the numerous shops, the better education, the freedom and the amusements, we need not be surprised at what is called the rural exodus, which will not be stopped till the agricultural labourer can put into his pocket on a Saturday night as much net cash as a bricklayer's labourer in a town. The only surprising thing is that every able-bodied agricultural labourer who could manage to cross the Atlantic does not do so at once, and become a bricklayer's labourer in one of the upspringing cities of the States, where he would be in a more comfortable condition than any man in the same position is in any other part of the world.

But again we desire to caution our readers that they should remember that figures such as those in these official reports, while they "throw much light upon the movement of wages," should "be used only with a considerable degree of caution as tests of the average wages earned by the general body of workpeople." But mathematical certainty is impossible, and in default of this, it is certainly both interesting and instructive to endeavour to obtain by means of these statistics some kind of view — imperfect though it may be—of the financial, and so of the general, condition of one class of workmen in Europe and America; from which we may gain also some idea of the condition of other, and not less important, classes.

WILLIAM AND MARY CHAPELS.

BESIDES shortcomings in the matters of stability, light, ventilation, and accommodation in the old meeting-houses erected by the earliest Nonconformists, the difficulty of access to the secluded sites chosen for them often resulted in resolutions to erect new buildings in more accessible positions. Hence, out of the thousand chapels computed to have been built after the passing of the Act legalising their erection, but few remain to us, the greater number having been rebuilt either on new sites or on the old ones. In one instance, at Alnwick, only the pewter alms-dish, dated 1689, of the original "meeting" remains in the new chapel built on its site.

We have, however, some examples. The William and Mary Chapel at Newbury was founded in 1697, and remains but little changed from its original form. The simple front is in three divisions, each terminating in a receding gable. On the ground floor there are two large windows with a mural tablet between them and a doorway on either side of them. On the upper floor are four double-light windows, oblong, plain, and uniform. Here for many years ministered Daniel Mace, who was the author of one of the earliest Greek and English New Testaments.

St. Nicholas's old meeting-house in Ipswich, built in 1700, is still in evidence. It has two doorways in the calm, staid frontage, and over each is an eye-shaped panel; between them are two rows of quadrangular diamond-paned windows, three in number; and over all rises a plain sloping roof. The framework is of timber covered with lath and plaster, and the floor is of brick, unless it has been disturbed recently. The pulpit is ornamented with carvings and twisted banisters. As we look upon this and the other placid interiors we can but think of their first congregations faltering in and taking their seats in confiding silence, flower-faced maidens (Puritan pansies, Poe called them), fair matrons, elders, and "white-haired traders" among them. Their costumes, the accents of their speech, the turn of their thoughts, are all matters of curiosity to us now; and the impress of their long-past presence has a peculiar charm.

One of the most interesting of these buildings left to us is at Knutsford, in Cheshire. Authorities differ as to whether it was this chapel or that at Dean's Row, or that at Macclesfield, to which Mrs. Gaskell referred in her story of Ruth, all three being of contemporary date. There are two sets of external stairs attached to the frontage, one at each extremity, and access to the ground floor of the chapel is gained through doorways in the walling that supports them. The diamond-paned windows have mullions and drip-stones, and impart a delightful old-world air; and foliage is not wanting to give an extra charm. Another interesting Cheshire example is in the county town. This is the chapel built for Matthew Henry. Some of the walling has been renewed and a new front built; but within, although his Commentaries may be no longer chained to the gallery as they used to be, we may see the same two lines of massive oaken pillars, and the same pulpit that was originally placed in it. The oaken gallery, too, is the same that was added when there was an influx of three hundred and fifty additional communicants, owing to the retirement of a contemporary minister, though the space below it was partitioned off many years ago to accommodate members who had seceded from the rest.

At Swarthmoor, among the fells and dales, there is a very pathetic little chapel. It is in a lane, and by the side of it is a small graveyard. Over the door is a stone inscribed "Ex dono G. F. 1688," thus intimating it was the gift of George Fox. It is but little more than a room, with whitewashed walls and a floor of blue flagstones. The seats are wooden forms, unpainted. But there is a small gallery, and the passage-way leading to it is supported by posts that are said, reverently, to be portions of the ebony four-post bedstead that once belonged to the donor. On a wooden desk, under glass, is a bible printed in 1541, which is open at the passage, "I am hevy and abashed, is there not tryacle at Gylyad?" It has a chain and padlock. This William and Mary edifice belonged to the Society of Friends. Pepys wrote, it will be remembered, in 1661, "I find that both here (Baldwick) and everywhere else that I come, the Quakers do still continue, and rather grow than lessen."

There is another early Nonconformist building with chained books still preserved in it at Lydgate, near Huddersfield. These volumes are Tillotson's sermons, and they are chained to a shelf under the Communion table. This chapel was originally constructed in 1695, partially rebuilt in 1768, furnished with a gallery in 1786, and with a turret in 1848. Its windows are long and narrow with semi-circular headings, like those Sir Christopher Wren designed for so many of the London churches after the Great Fire.

A William and Mary chapel at Ramsbottom is all the brighter for the associations that Charles Dickens gave to its frequenters, the brothers Grant, under the name of Cheeryble Brothers. Examples at Coventry, Leicester, and Hinckley are similar in style, plain and quadrangular. On a sundial built into the south wall of another of these fabrics at Blackley may be read the pith of many a searching of heart:—

> "My change is sure, it may be soon,
> Each hastening minute leads me on;
> The awful summons draweth nigh
> And every day I live to die. 1697."

Without long-drawn-out arcades of columns, "vapourous grey" or otherwise, with no carved angels in the roofs, no shadowy mouldings, no sculptured mysteries over the doorways, no geometric tracery in the windows, or painted glass, these buildings, with their touch with other times, their indomitable and strenuous continuance, are not without attraction for many minds. One in Nottingham has been altered five times, till it now has a thousand sittings. Another, less favoured, at Stamfordham, in Northumberland, has been turned into a stable; two in Pudding-chare, Newcastle-on-Tyne, and Berwick-on-Tweed into warehouses; one at Whitchurch, Salop, into a school.

We have a few meeting-houses still older than William and Mary's reign. At Horningsham there is one with the date 1566 on a tablet in the gable. To this building, says local tradition, came the Scottish Presbyterian masons, disciples of John Knox, who were engaged to build Longleat House for Sir John Thynne. They refused to attend the parish church, being probably the same stern and staunch sort of masons that Carlyle represents his father to have been, and they obtained a grant of this building, which sets forth that it is intended for the use of Protestant Dissenters. A condition was attached to the effect that the walls were not to be raised, and that the roof was to be thatched, in consequence of which stipulation the lowly, simple little place, with its hipped gables and three dormers lifting up the thatch, has been handed down intact. Tavistock Chapel is of a greater antiquity of another kind. When the Vicar of Tavistock was ejected, the Earl of Bedford made over to him the Abbot's Chapel of the monastery suppressed at the Reformation, which has continued in use ever since. Part of a Dominican friary is still used, too, by the Society of Friends at Bristol. At

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Haslington, in Cheshire, the chapel of the ancient family of Vernon was licensed for a meeting-house in 1689. But the William and Mary chapels have an interest more distinctly their own, and quite worthy of survey.

NOTES.

Liverpool Cathedral.

In Wednesday's *Times* Mr. Reginald Blomfield wrote an excellent letter on the subject of the absurd demand for a Liverpool cathedral in the Gothic style. How much chance he has of getting the Committee to understand him is obvious from the answer which he has elicited from Mr. Robert Gladstone in Thursday's *Times*; one of the most amusing things we have read for some time, much more so than its writer has any idea of. Mr. Gladstone totally fails even to understand Mr. Blomfield's argument, but assures us that he has been a student of architecture for forty years; "he has not forgotten that the early Christians converted the available basilicas into churches," nor is he ignorant of the rise and fall of Gothic architecture: "how it emerged from the clumsy grandeur of Norman, attained its most sublime beauty during the 100 years to which I referred, and then by the elaboration of pretty details it gradually deteriorated until architects in despair called in the more sturdy accessories of the Grecian and Roman orders to revivify their expiring art;" and as Sir Gilbert Scott pointed out to the Institute of Architects the beauties of Westminster Abbey, can we do better than imitate that? &c., &c. In short, Mr. Gladstone is just where architectural amateurs were half a century ago; repeating the old formulæ and the old superstitions of the Gothic revival, as if the world had not moved since then. It is hopeless; but it is certainly amusing. He should, however, at all events, look up his facts about the basilicas; he will find they are out of date.

Giggleswick School Chapel.

In reference to a passing remark in our report on the new chapel at Giggleswick school last week, to the effect that an octagonal dome is not constructionally a dome in the proper sense of the word, Mr. T. G. Jackson writes to say that the Giggleswick dome is constructionally a true dome, with a circular plan on the interior lines, and is only modelled into an octagonal plan on the exterior. Our remark was not intended exactly as a criticism, but merely as drawing attention to the fact that a structurally octagonal dome, however you may call it a dome, is under quite different statical conditions from a true dome; and the exterior view of the chapel which was exhibited at the Royal Academy, and subsequently, by the architect's consent, published in our pages, gave us the impression that this was an ordinary octagon cupola, as it appears so externally. The object of the treatment of course is to harmonise the cupola externally with the general lines of the architecture, which are Gothic in feeling, though Gothic of a very free type. The experiment is an interesting one, and was perhaps worth making, though it has the drawback of making the exterior of the cupola a contradiction of the interior. The moral is, perhaps, that you cannot harmonise a spherical dome with the prevalent line and feeling of Gothic architecture. But as an architectural feature the octagonal cupola is an object far inferior in beauty and impressiveness to the true spherical dome.

Trees in Whitehall.

It is a matter for regret that the Works Committee of the Westminster Corporation have not seen their way to recommend the planting of trees in Whitehall. But the reasons given seem to put an end to the possibility. It is said that the roadway is so cellared under and so full of pipes that it is impossible to plant trees in this thoroughfare. This is a little surprising, because we should not have supposed that Whitehall was more largely "undermined" than some other thoroughfares where trees are planted. The public must, however, acquiesce in these reasons with their present knowledge. We trust, however, that the Westminster Corporation will look further into this matter and seek for other places where trees could be planted, as, for example, in Waterloo-place, if that be within their jurisdiction. As we recently pointed out, there are many open spaces in London which would be greatly improved in effect if trees were planted in them. Why, we may ask, should not trees be planted in the forecourt of the British Museum? They are doing well in Great Russell-street.

The Westminster Paving Contract.

We welcome the criticism of the Westminster ratepayers upon the circumstance of the paving contract for that borough, because it is only by reason of an interest being taken in municipal affairs by the general body of citizens that their representatives can be kept up to the mark. But at the interview of the deputation of ratepayers with the Works Committee last week the former were much too vague in their charges—vague, that is, because their case clearly rested rather on suspicion than on proved facts. The point that the paving blocks were bad seemed to be entirely disproved by independent evidence. It is true that the Committee had also the evidence of an expert, but on the facts as published his opinion would seem to be erroneous. But the Westminster Corporation seem only to have themselves to thank for the creation of these suspicions. It appears that they admitted that though some tenders were rejected because they were not in accord with the specifications, yet that the tender of the Improved Wood Pavement Company was accepted although that company was not prepared to supply blocks as specified. The moment a public body departs from the proper and straightforward course of rejecting all tenders which are not in accordance with the specifications and accepting one that is not, at that moment suspicion of underhand dealing is aroused, and such facts as close intimacy between the contractor and an official of the corporation appear to suggest some form of conspiracy. The old saying, that Cæsar's wife should be above suspicion, is peculiarly applicable to the contracts of corporations, which should always be carried out even with an excess of purity. That being so, there can be no doubt that the public discussion and investigation of the Westminster Paving Contract is wholly to the public advantage.

Mr. Pullman on London Traffic.

Mr. Pullman, whose name may be said now to be a household word among railway travellers, is, after a lapse of twenty-five years, paying another visit to this country, and has addressed an interesting letter to the *Times* on the subject of the traffic of London. He finds London in as bad if not a worse condition than it was a quarter of a century ago. Many imperfections in the system there no doubt are, but it is impossible to doubt that in many respects it is improved. We have only to look, for example, at the outsides of the omnibuses. But there is one point which Mr. Pullman makes which is worthy of the closest attention, namely, the necessity for a central body to control the London streets. We cannot doubt that the divided authority of the various local bodies over the streets is very injurious to the public interest. It would be an immense gain if the sole highway authority for London were the County Council. The cost of administration would be less because there would not be so many officials, and there would be no clashing of rival authorities. At present one end of a street which belongs to one municipality is well lighted; the other which belongs to another is in darkness. But with the present Government in power we fear that it is hopeless to work for this necessary reform, though some day it will certainly come to pass. The whole question, indeed, of the jurisdictions over London streets and the powers of companies to pull them up requires investigation, and we commend the matter to the attention of Mr. Ritchie, the Home Secretary, who is the man of business of the Cabinet.

Apprenticeship and Technical Education.

It is satisfactory to note a really useful step being taken towards the union of practical and theoretical training for the artisan. For this is the object of the circular issued by the Plumbers' Company and representatives of various important local bodies. Apprenticeship alone can only teach by experience, though here and there there may be a master who will give explanations. But apprenticeship *plus* purely educational teaching gives the two desiderata. The means suggested by the Plumbers' Company's power of indenture are—attendance at classes as one of the conditions of the contract of apprenticeship, and the cancellation of the articles if the apprentice fails in an examination. But it is clear that, in order that such a scheme should have full results, there must be a complete system of registration of plumbers, or, indeed, of any other artisans, and that only those who are registered should be eligible for important work. If a doctor could practise whether or not he passed the necessary examinations, we should have plenty of unqualified practitioners, and there must always be a number of these men in every trade until efficiency obtains its proper recognition; but it is impossible to confine a trade merely to those who have been pronounced to be competent by examination, however desirable it may be that only those who are efficient should be employed.

Electric Meters.

Several electric lighting companies who test their own meters are in the habit of marking them in such a way that consumers are misled into thinking that they have been tested by an independent authority. This seems to us a very objectionable practice, and we should have thought that it would be sufficient to draw the attention of the Board of Trade to it to have it at once

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stopped. From the Report submitted last week by the Highways Committee to the London County Council it appears that the Board o Trade regards this practice with great complacency. It considers that the time has not yet arrived for compulsory legislation in the matter owing to the very limited number of types of meter which it has officially sanctioned. This seems to us an extraordinary reason to give. Are we to infer that nearly every type of electric meter is bad, and that, therefore, it is of little consequence what stamp, official or otherwise, is put on it? It was the original intention of the orders granted to electric lighting companies in London that the County Council should duly certify and stamp approved types of electric meters. The Board of Trade standardising laboratory has been in existence for some ten years, and we have often heard complaints from manufacturers of the length of time which elapses before they hear whether their meters, are approved or not. It seems to us that the Board of Trade might very well be content with somewhat less severe tests, and that an accuracy which more than satisfies the standards insisted on by many countries abroad, where electricity is much more extensively employed than in this country, ought to satisfy them. The consumer has a right to have a meter tested by the County Council, and the supply companies, by stamping their own meters, are deceiving the public. The Board of Trade informed the Highways Committee that as the question is one which affects electricity supply generally and not London alone, the expediency of the Council taking action in the matter is doubtful. "Expediency" is a somewhat low standard for an official department to adopt. What dreadful thing would happen if the suspicious practices of a few of the London supply companies were stopped? The supply companies, remembering the ease with which the Board of Trade allowed them to raise the pressure of their supply, must be beginning to look upon it as their natural protector from the London County Council, which acts in what it believes to be the interests of the public.

The Light from Alternating Current Lamps.

So far as the eye can judge, the light coming from glow lamps supplied from ordinary direct or alternating current circuits is the same. A very simple experiment will, however, show that there is a notable difference between the two. Take a round disc of cardboard and divide it up into white and black sectors alternately. Fix it on the top of a cork in the lower end of which is stuck a wooden match with a sharp end, thus forming a kind of teetotum. On spinning it round the top of the disc will appear of a uniform grey colour. If it is now illuminated by light coming from an alternating current lamp, preferably one of low candle power, at a particular speed, the sectors will appear to rotate rapidly; they will then slow down until they appear stationary, and after rotating in the opposite direction, will finally disappear, and the disc appear uniformly grey, as it did at the start. This proves conclusively that the filament of the lamp varies in brightness with the frequency of the alternating current, It is well known to electricians that the light from an arc lamp supplied by alternating currents behaves in a similar manner, and it has been used in practice to tell when a dynamo has reached the same speed as the other dynamos in the central station. the spokes of the fly-wheel dynamo illuminated by the light from the station arc lamps appearing stationary when its speed is the same as the other machines. In a remarkable paper recently read by M. Hospitalier to the Société Internationale des Electriciens he describes numerous applications of these stroboscopic methods to the study of the main phenomena of alternating currents, and he exhibited a series of new and useful instruments founded on these methods. By means of one of them, the "Arcoscope," he throws the image of an alternating current arc on a screen and makes it go through all its periodic variations slowly, which in reality it does in the hundredth part of a second. Other ingenious practical instruments he has devised are one which accurately records in ink a curve showing all the variations of the current during the hundredth part of a second, and another entirely novel one showing how the power given out by the dynamo is continually varying, and how during a minute fraction of a second it is actually negative, thus showing that the circuit restores to the dynamo a fraction of the work it receives. These instruments, though designed primarily to help electrical engineers in their every-day work, are obviously of great educational value, and doubtless the coming generation will wonder at the ignorance of vital points in practical theory displayed by electricians at the end of the nineteenth century.

Old Sites and New Buildings, Shepherdess-walk.

A new police station, erected after the designs of Mr. J. Dixon Butler, architect to the Receiver for the Metropolitan Police District, and accommodating thirty-four constables, has been recently opened in Shepherdess-walk, Hoxton. The new buildings stand on the sites of the Eagle Tavern and the Grecian Theatre, formerly Day's Saloon, which, after many vicissitudes of fortune, was pulled down in the winter of 1899-1900. The Eagle Tavern had been erected on the site of the Shepherd and Shepherdess tea-gardens, near Wenlock Barn — cited in "The Picture of London for 1803." In 1841 Thomas Rouse built the adjoining theatre, which was reconstructed and enlarged for Benjamin Conquest seventeen years afterwards. His son, George Conquest, in 1866-7, built a larger playhouse—having a total capacity for more than 4,000 persons—with a stage, including the scene-dock, 60 ft. in depth. The site of the dancing-hall was taken for the new theatre, built by John Garrud, of Spitalfields, contractor, from J. T. Robinson's plans and designs, of which we published the interior view, with a plan, on November 3, 1877. In August, 1882, the premises were leased to the Salvation Army. Three years ago the Charity Commissioners framed a scheme in respect of the Bishopsgate Foundation Charity for the grant of building leases of the Eagle Tavern, the site of the Grecian Theatre, six almshouses, and some adjacent property fronting Nile-street and Shepherdess-walk, at annual rents amounting to 3,500*l.*, the lessee being required to expend in building a sum to yield a rack rental of 17,500*l.* per annum. An Act passed in March, 1898, empowered the Receiver of Police, by an order of the Secretary of State, to acquire a portion, 39,076 sq. ft., of the property, for a ground rent apportioned at 895*l.* per annum. The then lessee under the Commissioners claimed a large sum, varying from 16,000*l.* to 21,000*l.* The matter was referred to arbitration, and in the result Mr. Balfour Browne, K.C., as umpire, assessed the value of the police-station site at 8,375*l.*

St. Dunstan's Church, Stepney.

The old parish church of Stepney, to which the fire of last Saturday morning did so much damage, had been reopened on December 7, 1899, having been closed during nine months for some extensive repairs and alterations, carried out by Messrs. Dove Brothers, under the directions and superintendence of Messrs. J. E. K. & J. P. Cutts, at a cost of 5,427*l.* The repairs included the reflooring, reseating, and removal of the galleries, and the organ (by Bryceson, 1872) was rebuilt and enlarged. The church was restored in 1847 by Benjamin Ferrey, and in 1872 by Arthur Shean Newman and Arthur Billing. The fire, which it is conjectured originated in the heating apparatus, has consumed the vestry, the organ and organ loft, and the greater portion of the nave roof. Other parts of the fabric, together with the great east window, have suffered considerable damage by heat, smoke, water, and breakage, but the monuments escaped from injury. The church was rebuilt in the later half of the fifteenth century, its predecessor having been erected, says Matthew Paris, by Archbishop Dunstan in place of one that had been dedicated to All Saints. After Dunstan's death and canonisation, his church was re-dedicated in his name. Hatton records (1708) that a west porch was added in 1612. The fabric is of stone and flint, with a low buttressed tower and embattled parapets. As some of the insurance (11,000*l.*) on the church is unavailable for the injuries to the fabric, it s expected that more than 2,000*l.* will be irequired, over and above the insurance, to make them good.

The London Sketch Club.

We were at first under the impression that the seventh exhibition of the London Sketch Club, now open at 175, Bond-street, was a distinct advance on its predecessors; but it seems rather that the best works have been hung among the earlier numbers of the catalogue. Mr. Lenfesty's "Storm" (1) and "The Bridge" (7), are very fine examples of broad and powerful sketching of open air effect and wild skies; and Mr. Lionel Edwardes's two studies of horses (4, 12) are admirable in their kind. There is rather a decrescendo as we get further on. Mr. Clifford's "The Village by Moonlight" (28) is a very good piece of light effect, but rather too obviously imitated from Mr. Thaulow. "A Breezy Day" (51), by Mr. Walter Fowler, a kind of De Koening landscape effect, is powerful; Mr. Wadham's "Gorseland" (66) and Mr. Lenfesty's "Bosham" (69), and Mr. Champion Jones's "Slaughden" (70) are broad free sketches; Mr. Frank Jackson has a good study of local personages and colour in "Market Place, Etaples" (71), and Mr. Fitzgerald's "The Assassin" (83) looks the part. In Mr. H. T. Clifford's small sketch of "St. Paul's" (114) the circular lines of the dome are in true perspective (which we seldom see in a picture); in Mr. Lauder's "St. Paul's from the Boro'" (149) the build-

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ing is not upright; and his sketch of "The Westminster Memorial" (39) the column is not only not straight but far too thin in proportion to its height. It is curious how painters will misrepresent the proportions of architecture even with the object itself before them.

THE ARCHITECTURAL ASSOCIATION:

ANNUAL GENERAL MEETING.

THE annual general meeting of this Association (the first meeting for the session 1901-1902) was held on Friday evening last week in the meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. W. H. Seth-Smith, President, in the chair.

The Annual Report and Balance sheet.

The minutes of last meeting having been read and confirmed,

Mr. E. W. Mountford proposed the adoption of the Report and balance-sheet of the committee. The Report states that the fifty-fourth session, which terminated on May 31 last, has been a prosperous one in every respect. The membership shows a substantial increase, and financially the session has been a great improvement over previous years. One hundred and sixteen new members were elected, six were reinstated, and the losses by death, resignation, and other causes amounted to thirty-seven, the total membership on the last day of the session being 1,376. In reference to the newly-formed day classes, the committee trusts that architects will support them by aiding their pupils to attend the studio and lectures during their pupilage. The Premises Sub-Committee has come to the conclusion that it is impossible to take advantage of any desirable building sites that may offer themselves until a substantial premises fund has been formed. It is therefore proposed to take steps towards that end.

Mr. Mountford, in proposing the adoption of the Report and balance-sheet, said that for the first time they were able to congratulate themselves on having an excess of income over expenditure, there being something like 500*l.* to the good. That was very satisfactory, and had all the members paid their subscriptions, the result would have been even better.

Mr. F. T. Baggallay formally seconded the motion, which was then agreed to.

The Chairman said he had great pleasure in proposing a hearty vote of thanks to the Royal Institute of British Architects for its tenth grant of 100*l.* towards the educational work of the Association. The money had been of very valuable assistance in the past, and he did not know how the work would have been carried on but for the help of the Institute. It was just as useful now as ever it was—perhaps more so, seeing the heavy financial responsibility they had undertaken.

The motion having been heartily agreed to,

The Chairman proposed a hearty vote of thanks to Mrs. Arther Cates for having presented to the library a handsome donation of books left by her late husband. It was one of the very best donations that had ever been made to the Association. He believed that Mrs. Cates intended to present them with a handsome book-case to hold the books.

The vote of thanks having been carried by acclamation, a vote of condolence was, on the motion of the Chairman, passed to the relatives of the late Mr. James Brooks. Mr. Brooks was well known by his works, which all admired; they were thoroughly English and good.

Messrs. F. R. Herring and F. H. Swinyard were then elected members, and it was announced that there were fifty-one nominations.

Mr. R. S. Balfour, hon. secretary, announced the following donations to the library:—A collection of about twenty books, presented by Mrs. Brydon; the Annual Report of the Smithsonian Institute; "Designing Ironwork," presented by Professor Henry Adams; "The Architecture of Coriolanus," presented by Mr. R. Phené Spiers; "Greek and Roman Orders" (by Mr. G. E. Mitchell), presented by the publisher, Mr. B. T. Batsford; "Early Renaissance Architecture in England" (by Mr. J. A. Gotch), presented by the publisher, Mr. B. T. Batsford.

A vote of thanks having been passed to the donors,

On the motion of Mr. Balfour, a vote of thanks was accorded to Mr. Edmund Sharpe and his brothers and sisters for a collection of diagrams belonging to the late Edmund Sharpe, for use in the day school, and to Mr. R. Phené Spiers for obtaining them.

Mr. H. P. G. Maule, hon. secretary, read letters expressing inability of the writers to be present that evening from the President of the Institute, Mr. Wm. Emerson, and Mr. G. H. Fellowes-Prynne.

The Chairman then delivered the prizes and studentships for session 1900-1901:—

A. A. Travelling Studentship, value 25*l.*, and silver medal, Mr. J. E. Forbes; second prize, value 5*l.*, Mr. L. G. Detmar; A. A. Medal, value 10*l.* 10*s.*, Mr. G. Drysdale; Banister Fletcher Bursary, value twenty-five guineas, and medal, Mr. T. F. Green; Hon. Mention, Mr. A. C. Bossom; Andrew Oliver Prize, value 5*l.* 5*s.*, D. Anderson, R. E. Stewardson (prize divided), *aeq.*; Architectural Union Company's Prize, not awarded; Essay Prize, Mr. G. H. Lovegrove.

Lectures. Division 1.—Mr. E. Gunn, A. A. Scholarship, value 4*l.* 4*s.*; Mr. H. E. Rider, Prize, value 1*l.* 1*s.*

Lectures. Division 2.—Mr. L. W. Ensor, Prize, value 2*l.* 2*s.*

Studio, Division 1 (Construction).—Mr. D. W. Stewart, Prize, value 10*s.* 6*d.*

Studio, Division 2 (Time Sketches).—Mr. C. M. Crickmer, Prize, value 10*s.* 6*d.*

Book Prizes.—Lectures. Division 1: Greek and Roman Orders.—Mr. E. Gunn.

Elementary Construction.—Mr. H. E. Rider.

English Architecture.—Mr. E. Gunn.

Mediæval and Renaissance Architecture.—Mr. H. F. Tasker.

Elementary Physics, Formulæ, and Calculations.—Mr. D. Anderson.

Plane and Solid Geometry.—Mr. E. G. Allen.

Lectures. Division 2: Materials, their Nature and Application.—Mr. H. Greenly.

Construction.—Mr. L. W. Ensor.

Drainage and Water Supply.—Mr. L. W. Ensor, Mr. H. Greenly.

Ventilation, Lighting, and Heating.—Mr. L. W. Ensor.

Mensuration, Land Surveying and Levelling.—Mr. L. W. Ensor.

Elementary Class of Design.—Prize, value 3*l.* 3*s.*, and Bronze Medal, Mr. E. G. Theakston; Certificate, H. Hyams, R. E. Stewardson, A. E. R. Gill, W. C. Le Maitre.

Advanced Class of Design.—Prize, value 5*l.* 5*s.*, and Bronze Medal and Pass for Modelling Class, Mr. A. Wingate; Certificate and Bronze Medal and Pass for Modelling Class, Mr. A. Durst; Pass for Modelling Class, A. A. Carter and E. Brantwood Muff.

The Chairman announced that the conversazione would be held on the 25th inst at the Royal Institute of Painters in Water Colours, Piccadilly, W., where the Exhibition of International Art was being held.

The President's Address.

The following address was then delivered by the Chairman:—

In doing me the honour of calling me to preside over your interests for a second year, you have imposed upon me the difficult duty of having to address you a second time. To prepare a statement of general principles and of one's own views on various points connected with our art and our profession is a task easy of accomplishment as compared with that of choosing a subject sufficiently interesting to form the keynote of another essay. Not that ours is so prosaic a calling as to be lacking in questions of importance; on the contrary, I suppose there is no other profession which gives birth to so many interesting controversies. But as we are an eminently business-like society, I propose this year to be more directly practical, reviewing our recent work and sketching what I conceive to be the policy of the A.A. in the immediate future.

During the past session we have had to say farewell to the nineteenth century, and simultaneously to the longest reign and to the greatest and best Sovereign that ever occupied the throne of this nation; one who for sixty-three years ruled us with wisdom and personal virtue. Two such events would mark any year as memorable.

As regards our own affairs, it has been a session of unparalleled prosperity, clouded only by the losses we have sustained by death, which has claimed eight of our members in the twelve months, and we know we have just sustained another loss in the death of Mr. James Brooks. But some men there are whose passing leaves a great void, alters in fact for a time the whole complexion of things. Such men were John McKean Brydon, Arthur Cates, and William Young. The first formally joined us only recently, the last was not a member, but all were warm supporters of our work. We can pay them no higher tribute than to say they possessed that admiration and trust to which their professional attainments as well as their personal goodness entitled them. Brydon was especially one of those who win all hearts. By his death many of us have lost a dear friend. Mr. Cates became a member in 1847, and was hon. secretary in 1852 and 1853, so that his interest in this Association covers more than half a century, and that interest was as direct and influential at the end as in the beginning, for at the time of his death he was a most active member of both the Education and the Premises Committees.

Success has attended all departments of our work. We have added 116 new names to our membership roll, besides reinstating six others, and our financial position at the close of the year has been the best on record.

The "Sketch Book," which for thirty-five years has figured so largely in connexion with the work of this Association, but has been hitherto run by an independent committee, with our indefatigable members, Messrs. William G. B. Lewis, William A. Pite as editors, and Mr. Edgar H. Selby as treasurer and secretary, has, at the request of these gentlemen, been taken over by the General Committee. In recording our debt of gratitude to those who have conducted it so long and so ably, and whose services we are fortunate enough to retain for the most part, I am sure you will agree that under the direct supervision of the General Committee such a periodical ought to become a very valuable property. May I urge members to endorse the Committee's action by supporting it, either as authors of plates or as subscribers?

The past history of this Association is a history of education. In accordance with its traditions we have, during the session just closed, tried to meet the demands of the profession and of the public for better education as far as those demands can safely be ascertained by a careful review of art feeling in the community, and the growing sense in the profession that with us lies in great measure the responsibility for raising public taste in building. This sense of the beautiful can only grow as it is nurtured by observing the objects of beauty it is our function to create. You have, after mature consideration, added to the curricula a day school, and with its opening next week we enter upon a course entailing increased responsibility upon this Association. You are probably all conversant with the general principle of which this school is the outcome, namely, that if a young man is not to waste his employer's and his own time it cannot possibly be a good thing that he should be plunged into a busy office without some preliminary training. It is difficult to imagine on what grounds such a principle can be objected to. We are happy in having secured the services of Mr. Arthur Bolton as head master of this school. In his hands it is sure to grow and prosper as the evening studio has done under Mr. Lewis' direction. We feel satisfied it will receive the encouragement of the profession. Success depends on this. I would urge young men whose bent is towards architecture to enter this school, either directly or by agreement with the principals to whom they may wish to be articled. I believe most principals of standing will be found willing to give such pupils as may be unable to attend the evening school facilities for attendance, if not regularly, at any rate for two or three terms at stated hours for certain courses they particularly need. Such an arrangement will be as advantageous to them as to their pupils, while those whose minds are not fully committed to this line in life will, by entering the school, have an opportunity of reconsidering their decision in the light of experience.

The *Times*, in a recent article on "The Organisation of University Education in the Metropolis," made the following remark:—"Beyond one or two courses of professional lectures, London has nothing in the nature of a school of architecture. It contains far more architects than any other city in the world and annually adds a larger quota to the profession than any other centre. But it leaves them to pick up their art in the old-fashioned way and makes no organised attempt to provide modern

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instruction. The result is, whether on the constructive or artistic side, we lag far behind the United States, France, and Germany." The last statement is true, but we may be pardoned for expressing mild surprise that the *Times* correspondent is not better informed as to the opportunities of obtaining a systematic training which this Association presents.

In no better way than by mingling socially and educationally as they do here with a body of enthusiastic fellow students and practising architects can men become emulous of the highest excellence. Nor indeed can they ascertain their own true level except by thus comparing themselves with those less, or more, gifted. All this gives a unique value to our Association as a training ground ; and more than this, the control and direction of its educational scheme is in the hands of an executive representing, in due proportion, the enthusiasm and aspiration of the *youth* of the profession not less than the experience of men who have seen considerable practice. Our list of visitors to the School of Design shows that the best London architects are giving their valuable time in teaching us, while our new Advisory Council contains the names of nearly all the architect members of the Royal Academies of the United Kingdom.

A word here to our students in both evening and day schools. The Committee too often observe a desire to go up for the Royal Institute of British Architects' examination after only a few months' direct preparation. This means cramming ; cramming means working at high pressure, and high pressure, as surely as a neglected education, spells *failure ;* not perhaps in passing the formal test, but in practical success in after life, which every student will admit is the real goal of professional education, though he may not have grasped the logical conclusion of that admission. The Architectural Association will, I hope, never be a party to this sort of thing. You must go elsewhere if you want it. It is not education at all. Passing the examination will make a man neither a skilled draughtsman nor a good builder ; but if he masters these essentials his success is assured, and they can only be attained by a long and patient course of work, systematised as carefully as it has been by this Association. Above all things believe that no system, however complete, can *teach* you architecture ; at its best it can but provide conditions suited to work, and teach you where and how to learn. Your education, viz., your mental development, will be the result of your effort to apply the information offered and to work it out for yourselves.

If the diploma (membership) is sought merely as the Institute's assurance to the world that you have had such a systematic training, as a guide to the subjects which it is necessary to know, and as an incentive to work at them, surely nothing but good can come of the examination which qualifies for that diploma. Let Emerson's testimony to our national character, written fifty years ago, inspire us to-day. In England, he says, "Every man is trained to some one art or detail and aims at perfection in that, not content unless he has something in which he surpasses all other men. He would rather not do anything at all than not do it well. I suppose no other people have such thoroughness."

As our art has a technical basis, this Association, if it is to become the educational power it aims to be, must act upon the universally admitted dictum so well expressed recently by Sir John Gorst, that technical instruction cannot possibly be assimilated by a student unless a proper foundation has previously been laid by a thorough grounding of elementary and secondary instruction. Surely this is also true of art. The more thorough an artist's general education, the more alert will be his mind in all directions and the more rapidly will he appropriate and assimilate the special knowledge needed to fit him for his chosen life-work. I therefore hope that the Committee will before long see their way to make admission to this day school conditional upon passing the Royal Institute of British Architects' preliminary examination or its exempting qualifications. And what is true of a broad grounding in general education in youth is equally true of early professional training. You must not specialise until you have some knowledge of every subject essential to the practice of every ordinary architect. The Association has been most careful not to introduce into its curricula any subject which does not come under this category. We might just as reasonably continue to educate our youth in the old style as attempt to convey the Metropolitan water supply in the good old wooden pipes we have just removed from the adjoining street.

Perhaps the most striking contribution during the past year to the discussion of this great question was Professor W. R. Lethaby's paper read before the Royal Institute of British Architects, entitled "Education in Building." It is an able history of the conditions under which architecture was carried on in the Middle Ages and up to the time of the Renaissance. He exhorts us by every means within our reach to encourage a high standard of practical excellence on the part of our executants (the British workmen), and to see to it that we ourselves not only understand building construction as the ABC of our profession, but that we endeavour to bring about a more co-operative spirit as between architect, builder, and mechanic. I hope all will read his delightful paper. But even supposing the buildings of those times were not under the control of a "magister" who designed and commanded, but were the creation of an "operator ipse magister," as contended by Professor Lethaby, he appears to us to under-rate the effects of the vast social and educational change the whole community has undergone since the days of which he writes and the impossibility of adjusting the old customs to modern requirements. Then it was only the King, the clergy, and the nobility who were patrons of the building art. We now have a very numerous and educated upper middle class who can afford to build. Their travelling and knowledge makes them critics in the matters of art, and anxious to imitate the ancient work they have seen.

All this has resulted in a demand that those they employ to design and direct their projects shall be of their own class ; shall know more than they themselves of the history and structure of these admirable works of old ; and shall build with an approximation to the same feeling ; shall, in fact, be scientific where they are dilettante. Professionalism is the expression of this demand for a high standard of training. Professional men, including those whose function is design and draughtsmanship, have come to stay. They form a large section of the upper middle class, and they are largely employed, not only by those of their own and of higher social status, but also by the numerous bodies representative of all classes alike who prefer to be advised (in carrying out complicated architectural problems unknown to mediævalists) by men who have been thoroughly trained, through long years and at great cost, in the art of planning and in the knowledge of building construction, rather than by mechanics, whose blunders, inevitable where several trades are working without a general superintendent, would not be tolerated in these days of scientific method and exactitude.

It is a fault in our training that our pupils are not on the works enough, and that we do not specialise enough. Highly-trained men, with a diploma from a guild or an institute or what not, ought really, if our building is to be of our best, to confine themselves to design and the supervision of building construction, and not to meddle with surveying, valuations and dilapidations, bills, &c., work which certainly does not savour of art. When as a profession we are more thoroughly trained, and when our occupation has obtained legal protection from the competition of unqualified persons, we shall be in a position to adopt more generally this higher standard of work. And when the last of these conditions is established, the first will naturally follow and the public will employ us more generally.

The absolute necessity of some protection of the title of *architect* and its confinement to duly trained men is being more widely felt every year. In addition to the striking unanimity of continental professional opinion which I mentioned a twelvemonth ago, we now have the weighty and closely reasoned pronouncement of the President of the Institute in favour of something of the kind. A law has just been passed in California with this purpose, and I am convinced that the majority of provincial professional opinions in this kingdom is in favour of it. The Institute's policy, moreover, since the establishment of the examinations is incomprehensible and illogical, excepting as based on this principle. After all, the proposal is only that the State should give us a justly acquired right to the expensively acquired skill and knowledge which it demands in the same *spirit* as it did to the mediæval guilds, but in the *manner* dictated by the political and social conditions of to-day.

Gentlemen, if this Association is not to experience a serious check in its useful career, we must now apply ourselves heart and soul to settling the vexed question of new premises. This may be done without undue labour if we all put our shoulders to the wheel, but not otherwise. I need not utter a word to you as to the urgent need for extension. We have completely outgrown our accommodation, and shall go on wasting money every year in trying to fit our square needs into round spaces until we can find suitable and sufficient room elsewhere. You will recollect that after many years' search for premises adaptable to our wants we abandoned the effort as impracticable, and for the last twelve months or more we have devoted much time and thought to finding a site suitable for erecting a building such as we want. One such came before us this last summer, but it would have involved a capital expenditure of at least 18,000*l.* (including the premium for the existing lease) ; and the impossibility of ascertaining how much we could collect towards this before it was necessary to close with the offer convinced the Committee that there was no other course than to make an appeal for funds this autumn, and thus be prepared to take up the next suitable site which may come before us.

Freehold we are unlikely to be able to get even if we could raise capital enough. Ground rent, with rates and taxes, repairs and insurance added, are all we can at present afford to pay out of annual income. We must, therefore, be prepared to collect the whole cost of building and equipment, and other expenses, a sum amounting (according to the two last building schemes gone into by the Premises Committee) to at least 20,000*l.* This estimate allows nothing for luxury, but would provide merely a simple building well designed to suit its purpose. The Committee believe they already see their way to something like 3,000*l.* within the next three years, including specific promises they have received.

If every member of the Association would kindly undertake to collect (not necessarily to give) at least a guinea this session we should have made a start, without external help, to the extent of about 5,000*l.*—a satisfactory guarantee of our enthusiasm and determination to have premises worthy of the work we are doing. It is, after all, the public more than the profession who will benefit by this encouragement of architecture in London, and we need not be shy in asking the support of our friends in so good a cause. When technical education is being so well endowed by private and public liberality art surely may claim its due share. Supposing our anticipations are realised so far, there ought to be no great difficulty in raising another 5,000*l.* from other sources within the present session, and with 10,000*l.* we might go forward in anticipation that a scheme so well inaugurated would be the best further appeal to the liberality of the profession and lovers of our art, and we might then reasonably expect to open our building free of debt within three years from the present date.

You may recollect the anecdote relating how Sir Thomas Lawrence offered his cartoons by Raphael and Michelangelo to the Oxford University for 7,000*l.* The offer was accepted, and the Committee, after collecting 3,000*l.*, called on Lord Eldon asking for 100*l.* He put down his name for 3,000*l.* They told him they could easily collect the remainder. "No," said he, "your men have probably collected all they can spare ; I can as well give the rest," and he wrote another cheque for the whole 4,000*l.* There are Lord Eldons still in existence ; let us hope they still retain enough interest in art to put this great educational effort on a broad basis, for who knows how many Michelangelos, and not mere individual efforts of their prototype, they may thus bestow upon their country !

One of the greatest thinkers of the nineteenth century* directs our attention to a point which should encourage and stimulate us as individual students as well as an Association of Architects, viz., that "in proportion to the excellence of any form of being is its progress tardy and its cycle fast." He says :—

"Compare the different faculties and feelings of

* Martineau

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the individual mind. You find them appear in the order of their excellence, the noblest approaching their maturity last. Sensation, which belongs to man in common with all other sentient beings, is the endowment of his earliest days. Memory, which simply prevents experience from perishing, which furnishes language to the lips and preserves the materials of the past for future treatment by the mind, ripens next. The understanding, which makes incursions and wins triumphs in the fields of abstract truth, is of later origin; while the great inventive power, which distinguishes all genius, which seems to sympathise with the devising spirit of the artificer of things, to apprehend by natural affinity the most subtle relations he has established, and from old and gross material to create the useful, the beautiful, the true, is the last, as it is the rarest and most glorious, of intellectual gifts."

Elsewhere he shows that the same principle applies to the works created as to the mind which originated them, thus:—

"As every great sentiment of the human mind shapes itself into expression in some form of art, it is fair to infer that a passion which has left no durable memorials . . . . cannot have wielded any great power. In measuring the art of any people, you find the proportion of their nature; for precisely here it is that the mind transcends the rule of mere utility and works to the scale not of any outward need, but of an inward affection that must come forth, and the deeper and more durable the feeling the less perishable are the monuments it creates. What, then, are the remains which you can study in the land of the Cæsars or the Ptolemies? The first obvious fact is that the buildings devoted to the convenience of the body are for the most part gone; while those that represent ideas of the mind are standing yet. The provision for shelter, the places of traffic, the treasuries of wealth, the home of domestic life . . . . have crumbled into the dust . . . . but the temple answering to the sense of the Infinite and Holy, the rock-hewn sepulchre where love and mystery blended into a twilight of surmise; the column or the bust of civic praise, grateful for services to the commonwealth: these survive the shock of war and the waste of centuries, and testify that religion, love, and honour for the good are inextinguishable. . . . Suppose the ages to have done their work on this great metropolis and buried all but its most durable remains. . . . There are the same great monuments of our humanity repeated still. . . . but in the midst of them you discover vestiges to which Greece and Rome present no parallel. . . . Here we have a new sentiment—of sympathy with defective and suffering humanity, which in heathendom has left, so far as I know, not one memorial of itself, and which now vies in the solidity of its creations with the most ancient passions of the soul. . . . Examples these of the Christian sense of the infinite worth there is in man—his sigh for what he ought to be, his grief for what he is; his faith that the meanest is but the highest in germ; his vow to clear every burden from the lot, to clear every film from the mind that makes his poor brother seem less than a Son of God."

Yet as students we chafe under the long and patient training required to educate this high faculty, and as a class of artists we sometimes allow our enthusiasm to suffer because national taste is so slow in developing. No one will deny that the art of the European Renaissance is a higher and nobler thing than that of the New Zealand Maoris, or assert that the art of Greece was produced *in spite* of the high intellect and civilisation of that people. Let it suffice that we *are* progressing and that time must be allowed in proportion to the excellence of our art. To us belongs only the responsibility of doing our best by cherishing at all cost the highest ideals and cultivating our personal talents to their utmost capacity.

Professor Beresford Pite, in proposing a vote of thanks to the chairman for his interesting and suggestive address, congratulated the Association on its era of unexampled prosperity. Having had some little experience in the affairs of the Association, he was overpowered by a knowledge of the present state of their financial affairs. With a membership of over 1,300, and an annual subscription of from half-a-guinea to a guinea, there was a balance on the right side of 500*l.*, and it was very much to be hoped that that condition of affairs would continue. He also thought that the Association was to be very warmly congratulated upon the drawings which were exhibited that evening. He did not think there could be any doubt that the standard of work in the classes and in the annual competitions had greatly improved in recent years. The Association was very much indebted to those kind friends who helped as visitors, and were really sources of inspiration in the School of Design. The Association was to be congratulated most heartily upon having a number of able and busy men who sacrificed time to visit the School, not for the purpose of teaching design, but to criticise the designs which the students produced. These student designs really gave an idea of the general progress of design in the profession, for, after all, they were produced by men working in architects' offices, and they represented to a great extent what were the current ideas in the profession. About one part of the address they had listened to he would like to take exception to, for it was an important matter to them as an Association—probably more important than the broader question that had been touched on. The President said, "yet as students we chafe under the long and patient training required." He (the speaker) was sorry if that was so. His own view of a student's life was that it was anything but "chafing." He could not understand a student working unless he enjoyed his work in architecture, and if the student did not he had better give it up, and go in for the examinations of a profession more congenial to his taste. Unless a student had enthusiasm imparted to him, or unless it were created in him, he was an unlucky fellow, and then it was that he "chafed under a long and patient training," especially when he saw other students bound ahead and, aided by divine enthusiasm, produce magnificent designs which won prizes. It seemed to him that all schemes of architectural education would fail of any real benefit to the profession unless they aimed at cultivating within the student this faculty of genuine artistic enthusiasm for architecture as a fine art. Students could design without the limitation of clients' requirements, without the bothers connected with estimates, builders, &c., and that ought to give real delight to students. He could assure those who had been studying in the Class of Design that they had been spending what would prove to be some of the best days in their professional life. In designing for a cantankerous client there was nothing like the pleasure that there was in the preparation of designs which were to be criticised by friends. The cultivation of enthusiasm was a difficult subject to dogmatise about, because enthusiasm came in so many ways to different men. It might come at home in England while practising sketching in villages and country towns and getting that wonderful fever for admiring everything that was old. They could look about their own town and district and take an interest in the buildings and in those who built, and then they would begin to feel some enthusiasm for even the commonplace buildings of their own district. They should also cultivate enthusiasm for the great men, and "take up" the life of a great man and work through it—the life of Cockerell, Burges, or some of the men of the Renaissance. Study their work; watch the development of their designs, and with some amount of hope that one day you will have some such opportunities that they had. Try and see in their work your own, and try and get personal enthusiasm to spring up." It was perfectly true that we could not afford to educate in the old style, but somehow or other the old style produced good results. How was it that men who were great architects when there were no schemes of education did such incomparable work, which was so complete in every detail, and showed such perfect mastery of everything? It must have been because of some underlying spirit which we wanted now. The Association was a body of young men most of whom were working in offices where good men did bad work; and the Association gathered all together under its wing and helped them to cultivate the art of architecture apart from office principles. Let them make the most of that—of the ordinary meetings, the visits to works in progress, the country trips, &c.; they were all of great use to students. They should not be easily satisfied with themselves as students or as architects. There was a great deal of truth that the architects' best friend was his india-rubber; still, the work they rubbed out was often their best work, and it was work they never got paid for. They should rub out persistently, for the true artist was never satisfied with himself.

Mr. Francis Hooper, in seconding the vote of thanks, said he thought the thanks of the meeting were also due to the ladies for their presence that evening. He heartily agreed with Professor Pite's remarks as to "chafing under long and patient training." If present-day students had as happy an experience as he (the speaker) had in his early A.A. days, they would not chafe under their training. He hoped Association students appreciated their opportunities of meeting men of experience prominent in their profession, who gave up valuable time to help younger men in their studies. In regard to the practical part of the work of an architect, it should always be borne in mind what was the object of their work. Take a building erected to the service of God—did it help the work for which it was erected? Take a Government or municipal office—to what extent were the officials indebted to the architect in the planning and arrangement of the building? Were the premises of the business man favourable for carrying on his business, or did the hospital-buildings aid the beneficent work of the doctor? To what extent were the cottager or housewife helped or hindered in their work by the houses they lived in? Was it not a patriotic thing for architects to have as a stimulus, in even the humblest work they undertook, the idea that they were helping human beings to do their work better, to be better citizens, to serve their country better? As to the finances of the Association, he had held the office of Hon. Treasurer so short a time that credit for the favourable balance was due to others. He hoped the fact that a member of Council of the Institute had discovered a balance on the right side would not induce the Institute to think that the Association no longer needed help. The annual donation from the Institute had been a great help to them in the past, and if new premises were to be found for the Association, as they should be, all the help they could get would be needed in the future.

The vote of thanks having been heartily agreed to,

The Chairman, in reply, said he hoped they would never think that he deprecated or underrated in any way the great importance of enthusiasm on the part of students of the Association. What he meant by chafing under long training was this: he had noticed a tendency in some very enthusiastic men, who were sure to do well on the art side of their work, to chafe under the necessity of thoroughly mastering building construction, and to go on producing designs which were thoroughly impracticable in planning and construction. It was against that that he entered a protest. As to great men designing beautiful works in the past without systematic training, that was perfectly true, but great men would be found in all periods, and to great men nothing was insuperable, for they could overcome any difficulties or disadvantages which might beset them. The Association trained the generality of men, and, as all men were not geniuses, one had to be very systematic to economise time in this busy age, and that was done by the progressive courses arranged by the Association.

The meeting then terminated.

The next meeting of the Association will be held on November 1, when Mr. Alexander Wood will read a paper on "Cambridge in Early and Mediæval Times."

ARCHITECTURAL ASSOCIATION SCHOOL OF DESIGN:

PRELIMINARY MEETING.

THE preliminary meeting of the Architectural Association School of Design was held at No. 9, Conduit-street, W., on October 15, the President, Mr. Seth-Smith, being in the chair. There was a good attendance of between fifty and sixty members, Mr. Macvicar Anderson and Mr. Statham having accepted the Committee's invitation to give a short address to the students. The President briefly called upon Mr. Anderson, who first said that he considered it an honour to address them, but he should explain that he had only been asked for an extempore address, and consequently had no written notes. He began by saying that architectural students had two advantages over older men—the advantage of youth and the hope of influencing the architecture of the twentieth century. The man in the street, if called upon to define an architect's work, would probably only think it meant designing, say, a front elevation. But we knew that it should include every part and every detail; and, in his opinion, the most important point of all was planning. He

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called it the art of planning, viz., to arrange a plan conveniently and well, and, in the case of a country house, with due consideration to aspect and prospect, and with rooms in their proper relationship to each other. He instanced the Law Courts as a fine building, practically ruined by an inconvenient plan, for which, however, the architect, Mr. Street, was not to blame, as the plan was dictated to him. The speaker went on to warn students against departing lightly from established rules which many generations of mankind have sanctioned. He instanced the Orders, and maintained that it was impossible to improve them and the established modes of setting them out. But some students were not content to take past ages as a guide, but in the desire to be original made over-bulging entases and other monstrosities which generally had a most ungraceful effect. He did not want them to imagine that they were not to exercise ingenuity and originality, but that beauty must not be sacrificed to originality. In effect, we must design in purity and simplicity, and in public buildings with symmetry. In conclusion, we must set before us lofty ideals and try to attain to a high standard. Unless we did this we should never rise above the ordinary level. We must thrash out and be critics of our own work, and then, by our lives and work, we might improve the century.

Mr. Statham then read a paper which will be published in full in our next issue, with some diagrams, and of which it is therefore unnecessary to give a *résumé* here.

The President then touched upon points in the two addresses, and said that the Association's endeavour was to train men of ordinary average ability for the work of life that they might become good and effective architects holding a high ideal before them. He proposed a hearty vote of thanks to Mr. Anderson and Mr. Statham for their great kindness in coming and giving them the benefit of their experience and knowledge. This was carried by acclamation and after Messrs. Anderson and Statham had briefly replied, a very successful meeting terminated.

MANCHESTER SOCIETY OF ARCHITECTS.

The following forms the most important portion of the address delivered to the Manchester Society of Architects by the President, Mr. A. Darbyshire, at the opening meeting of the session on the 10th ult. :—

"Having briefly attempted to describe the contrast between the architectural epochs of the middle of the last century and of the present time, it will be well to point out some of the defects (which have arisen, perhaps, as natural consequences) in the practice of architecture of the present day.

As a matter of fact, increased numbers generate competition, and with a larger market of architectural practitioners the general public is apt to treat the relationship with the profession from a commercial point of view. Any sympathy with sentimental conditions which may have existed in bygone years entirely disappears. For example, if a building has to be altered or enlarged (although recognised as a satisfactory work, and its author still living), the work is ruthlessly given to a stranger. Some years ago many of us have smarted under this treatment, but now the custom is general, and we accept it as a matter of course, and as evidence of the new commercial order of things. Again, it was the custom in times past, when any work of consequence requiring special knowledge had to be realised, to consult the architect who by accident or inclination might have shown a capability for such work. Nowadays a general competition must be instituted, and hundreds of men must throw away their brains and money in a hopeless effort to win the prize and to achieve renown. Yet another instance of the new order of things: An architect was awarded some years ago—and justly awarded—the first place in competitive designs for a cathedral. The work was postponed. Now it is to be taken up again, and quite recently it has been decreed that a new competition is to be held, and the man who had proved that he was pre-eminently qualified for the work has been set aside. Such is the sweeping policy which ushers in the twentieth century. It seems almost a waste of time to write or talk about this system of competition. Until very recent times the methods employed were disgraceful, and unworthy of those who used the system to take advantage of professional talent. It is, however, satisfactory to admit that improvement has taken place in recent years in the conduct of architectural competitions, but until competition is limited, each competitor remunerated, and the result adjudicated by a thoroughly competent and honourable architect, the system will remain incomplete and a scandal to our present state of civilisation.

Although I entertain fixed and strong convictions on this matter, I will modify what I have said by this remark. If it were possible by the means I have mentioned to secure genuine and honest results, then any dormant talent might be developed, and reputations made through the medium of competition. Genuine assessment is clearly the pivot on which such a result is to be turned.

I will now offer a few observations upon one or two matters which I think of interest and importance to us as a local society and as practical architects in a great provincial city.

The members of this Society are, no doubt, all cognisant of the fact that the Corporation of Manchester has determined to establish a municipal office of architecture to be presided over by an official who is to be styled 'The City Architect.' I doubt whether we have yet fully realised what this action will mean, or how much will depend upon it. What sort of a man is to hold the office, and with what powers is he to be invested? Is the City Architect to decide the future artistic development of architecture in the city, in addition to the technical points which may arise in the future? If the answer is in the affirmative, it will be evident even to the non-professional mind that the acceptance of such a responsibility involves the appointment of a man of high culture and great artistic knowledge. Again, does the contemplated appointment involve the designing of all public buildings and edifices under the control of the Corporation? If such should be the case, the profession would suffer materially. I venture, however, to think that a result of this kind is not contemplated by the Corporation. I fully appreciate the desire of the Corporation to appoint a City Architect, and I would have him invested with power to condemn all ugliness and purely commercial street architecture, but it would be undesirable to place the future architecture of the city entirely in his hands. Such a decision would be the death-blow to variety of architectural treatment, and the future civic architecture would be 'cribbed, cabined, and confined' to one line of thought. The proposed appointment of a City Architect seemed of such vital importance, that the Council of the Society after careful deliberation resolved to approach the Corporation on the subject, and the following resolution was forwarded to the Town Hall authorities :—

'That this Council hears with pleasure of the intention of the Manchester Corporation to appoint a competent architect as architectural adviser to the Corporation, and would respectfully suggest that this appointment should not prevent the Corporation giving to practising architects all works of architectural importance which they may in the future contemplate, this suggestion being made by them both in justice to the architectural profession [practising in this city] and as a means of securing more varied architectural treatment than would be possible if all designs emanated from one source, and this Council will have much pleasure in furthering the views of the Corporation in any way that it may consider desirable.'

In reply to this resolution, communications have been received from the Town Clerk and the Lord Mayor, to the effect that it has been placed before the Committee with whom the appointment of City Architect will rest, and that no decision has yet been arrived at. Should the Corporation accept the suggestion of your Council embodied in the latter part of the resolution, I need not say that any recommendation or advice will be given with a view to a right solution of a problem involving, as it may, the proper application of our art in the future street architecture of the city.

There is another matter which is of great importance to our local profession, and which requires careful consideration. I allude to the establishment of a chair of architecture at Owens College. The idea of a professor of architecture in connexion with the university is not a new one. It has occupied the attention of some of the elder members of the Society for several years past, but it is only recently that the matter has assumed a practical form, and that steps have been taken towards the realisation of an ideal which I venture to think would be of incalculable value to our profession in this city. It may be within the knowledge of members that a joint committee of the Society and the College has been appointed to take this matter into full consideration. A set of resolutions have been drawn up by the Committee, which fully explain the object of this important movement.

'1. That it is highly desirable to establish in Manchester a School of Architecture on the same general lines as those of the Liverpool School of Architecture and Applied Art.

2. That to give effect to this object there should be a Chair of Architecture in the Owens College with arrangements under which adequate preparation could be given for the existing Honours School of Architecture in the Faculty of Arts of the Victoria University.

3. That in order to provide for a complete School of Architecture, it is essential that there should be co-operation between the city, the profession, and the college. In particular it would not only avoid useless expense and overlapping, but would also tend to efficiency if a large portion of the instruction in drawing and building construction were taken in the Municipal School of Art and the Municipal Technical School.

4. That the above objects could be best obtained by the appointment of a representative Committee and of a single Director, who should also be Professor of Architecture at the College.'

These resolutions were signed by the Chairman of the College and by myself, and forwarded to the authorities of the Municipal Technical School and the Municipal School of Art. I regret to say that, after several interviews with the committees representing these institutions, our efforts have so so far proved unsuccessful. In point of fact, what they have already done by the appointment of Mr. Stannus as their teacher is sufficient, and they fail to see the necessity of employing any portion of the funds at their disposal for the establishment of a chair of architecture in connexion with the Victoria University. They do not understand how the dignity of the profession would be enhanced, its respect increased in the public mind, or how the bestowal of University honours would affect the future students of architecture in our city and locality. I cannot think that the matter will be allowed to rest where it is; it certainly will not be abandoned. It appears to me that we must fix upon the man best fitted to fill the chair of architecture, and then discuss a method of raising the funds to secure his services, for a time at least, or till such time as a permanent fund can be raised for the endowment of the chair at the Owens College.

There is a point in connexion with the practice of architecture to which I must briefly allude, and that is the collaboration of the architect, sculptor, and painter where works are to be carried out in which an artistic ideal has to be realised, or where a symbolic decorative language has to be used on an architectural foundation. It has always seemed to me that, although the architect provides the medium of artistic expression in his work, it is desirable that he should consult those who have to embellish it with high art adornment in sculptured or pictorial language—in other words, that proper preparation should be made for those sister arts which contribute so much towards the monumental character of architecture. I feel convinced that if a harmonious working together of the architect, sculptor, and painter was made a rule instead of an exception, many mistakes would be obviated and grander results would be realised. This is a subject upon which much might be said and written, and justice cannot be done to it on an occasion like the present.

I trust the coming architecture of the twentieth century may give evidence that the minds of architects are not only constructive, but that they will show an extended culture, and a consideration for the harmonious union of the sister arts with our own."

New Public Library, Falkirk.—The ceremony of laying the foundation-stone of Falkirk new Public Library took place on the 12th inst. The building is being erected in Hope-street, and is to provide, besides library and reading-room accommodation, a large recreation-room, which is also intended to be used as a lecture-room. To the cost of the erection of the library Mr. Carnegie has contributed 3,000*l.*, and the site is provided by the Town Council. The architects are Messrs. M'Arthy & Watson, of Edinburgh.

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IS A SCHOOL OF NATIONAL ARCHITECTURE POSSIBLE IN IRELAND?

THE above question formed the main point of the opening address delivered by Mr. C. J. MacCarthy, the President of the Architectural Association of Ireland, on the 8th inst. After some general preliminary remarks, Mr. MacCarthy continued:—

"But granted that a School of Architecture is possible and necessary, it may still be asked, Will not your attempt to make it national end in making it narrow and provincial? Is not all great art cosmopolitan? To the first of these questions the answer is an unqualified No; to the second a very qualified Yes.

Nationality and provincialism are as far asunder as the poles, and only a very loose habit of thought could ever confuse them.

As to cosmopolitanism in art, here, too, a confusion of thought exists. All great art must in its origin, in its growth, in its making, be instinct with the spirit of the country which has produced it, and therefore, in the true meaning of the word, essentially national. But there is a sense in which great art is cosmopolitan, for as soon as any nation has produced even one solitary work of really great art, that work belongs henceforth to mankind. The sculpture of Greece is to-day the inheritance and the birthright of every cultivated—I may say of every civilised—man. But none the less is it essentially Greek, Greek in its idea, in its spirit, in its character. And so it is with all great art, for, to quote again the words of Mr. Beresford Pite already quoted by our late President in his admirable valedictory address, 'Architectural art is but the expression of those influences which go to form the character of a nation.'

Now if I were asked to what branch of architecture I looked as holding forth the greatest promise of becoming the foundation of an Irish school, I would unhesitatingly say, to ecclesiastical architecture. It is to the Catholic Church, the Church of the majority in Ireland, rather than to the State, the Municipality, or to private enterprise, that we must look for the material out of which a school of national architecture is to be created.

Perhaps few of us realise what vast sums of money have been spent on the building of Catholic churches within the last fifty years. It would be difficult to estimate this amount, but it must, I think, be reckoned by millions. But although the building of churches shows, I think, no falling off as to numbers, it is a lamentable fact that, from the point of view of architecture, there has been for several years a distinct retrogression. We cannot conceal from ourselves that church architecture in Ireland has fallen upon evil days. However much we may be disposed to blame the leaders of the Gothic Revival in Ireland for having, under the influence of Pugin, adopted the English parish church as their model instead of seeking inspiration from such beautiful examples of purely Irish works as are found in Cashel, Holy Cross, Cong, and Kilkenny, to name but a few, still we must admit that they, at all events, were earnest men, and that their works are remarkable for beauty of design, honesty of intention, and sound construction. Can we say as much of our church architecture of to-day? Is it not, on the contrary, too often characterised by the absence of every one of these qualities? Intricate in design, yet absolutely without interest, the majority of modern Catholic churches are nothing short of a disgrace to the country. Flimsy in construction, ill-considered in plan and arrangement, made ridiculous by ill-placed, senseless carving, and pretentious but absolutely inartistic detail, these churches have been decorated internally in a manner of which literally I cannot trust myself to speak. It is safer for me to quote the words of a writer whose opinion on such a subject is valuable, and whose acquaintance with the facts is unquestioned. In an admirable paper read at what is known as the Maynooth Union in June last, Father O'Donovan, of Loughrea, stated as his deliberate opinion that the decorative work in our churches was without exception 'as bad, artistically considered, as one could possibly conceive. We have,' he said (that is, the clergy of the Catholic Church in Ireland), 'hitherto allied ourselves with the Philistines in art, and have followed the lead of incompetent architects and pushful commercial travellers from Birmingham and Munich.' 'There is scarcely a church in Ireland that has not one or more stained glass windows. In some of the larger churches the cost of these windows runs up to 3,000*l.* or 4,000*l.*, and in almost all cases this glass is, from the standpoint of art, beneath contempt.'

With every word of what Father O'Donovan has said I fully agree, yet I do not despair; on the contrary, I am filled with hope, because I believe that the lowest depth has now been reached; and when things have come to this pass they usually mend. But I have another and a brighter reason for hope. We must not forget that Ireland has a sound tradition, interrupted, but, I think, not altogether lost, of fine architecture, distinctively and peculiarly Irish; while in the decorative arts such as stone carving and metal work, our pre-eminence in the past is almost universally admitted.

I know it has been said that outside the early Romanesque work there is little or nothing distinctively Irish in our architecture, and that the Gothic work of, say, the thirteenth, fourteenth, and fifteenth centuries was largely English. This is, however, an erroneous opinion, and here I will call as witness a writer whose authority can hardly be questioned. I mean Mr. James Fergusson, whose 'History of Architecture' is still the standard work on the subject. Writing of the architecture of Ireland, he says: 'After the conquest of 1169, the English introduced their own pointed architecture . . . but beyond the pale their influence was hardly felt. Whatever was done was stamped with a character so distinctively Irish as to show how strong the feeling of the people was, and sufficient to prove how earnestly and successfully they would have laboured in the field of art had circumstances been favourable to its development.' All the Gothic work in Ireland was, in fact, marked by what Mr. Fergusson calls a foreign (that is, an un-English) character; while the cloisters of Muckross, Holycross, and Kilconnell are, he says, more like those to be met with in Sicily or Spain than anything in the British Islands.

But perhaps I have said enough about the distinctively Irish character of our architecture in the past. Let me turn again to the present, and more especially to the future, for already I think I can see the beginning of an art revival in Ireland. Though little more than a ripple on the surface of the water, it is there all the same, and indicates, if I mistake not, the onward flow of the tide. I do not care in the least whether you call it Celtic or Irish, there is a movement around us which is national in the widest sense—not in any narrow, or party, or political sense—a movement which has already given us that most astonishing revival of the Irish language, and a revival, less marked, but very real all the same, of music and literature. That this—in the true sense—national movement is certain to affect the artistic life of the country I, for one, cannot doubt. And I think that Father O'Donovan's paper from which I have quoted is a remarkable sign of the times; all the more remarkable when we remember the audience to whom it was addressed. I think it indicates that the clergy of the Catholic Church (who, you must remember, are the dispensers of enormous sums of money on architectural and decorative art) are at last awakening to a sense of their responsibility in this matter, and will no longer be led by the incompetent or careless architect or the pushful art-bagman. If this is so, we may indeed be on the threshold of a brighter and a better era, for, as soon as the general level of taste has risen and the demand for real art exists, the artist and the craftsman will be found to supply it.

If I am reminded that all this is largely a question of money, and that one cannot afford to employ artists to paint the walls and windows or carve the capitals and string courses of every country church, the answer is that half the country churches would be very much better without either carving or painting. If in future we will leave out the Carrara marble altar with its bristling reredos, the vulgar stained glass from Germany, and that impertinent carved oak pulpit from Belgium, and put the money into honest masonry instead, it will have cost us nothing, and we shall have done a good stroke of work for architecture and for Ireland. But when carving and painting are desired, let our first care be that they are not only good, but artistically the best that we can possibly procure, and until we have money enough to do this we must omit them altogether. Think how much better many a nave arcade would look to-day if all capitals had been left in the rough, or if the money wasted on carving ten badly had been spent upon doing one well. That one capital, well carved, would not only have been a joy to all who saw it, but would have served as a model for the emulation of those who in after years might be called on to carve the rest.

The objection on the score of cost must therefore fall to the ground—if good decorative work is too expensive, we can go without, or better still, of course, we can have a little of what is good, though costly, instead of a great deal of what is cheap, but nasty. It is in this spirit I think that we should look at the question of church decoration, but first, and above all, we must see that our architecture itself is beyond reproach, for though bad decorative work will ruin an otherwise beautiful building, no excellence of decoration will atone for errors of design or detail in the building itself. It is therefore to our architectural design that we shall have to devote our attention in the first instance, if we honestly desire better things. And here I must confess I am confronted by a very real difficulty, for even if I saw the way quite clearly myself (which, indeed, is more than I can pretend to do) it would be impossible for me within the scope of a short paper like this to do more than indicate in a general way the path which we should attempt to follow. As a first step on our road we must break with the evil practices of to-day, and then, turning to the past of our own country for inspiration, let us study in the first place at least the simplicity and dignity so characteristic of our earlier Gothic buildings. Thus and thus only, I think, can we hope to lay the foundation of a really national architecture."

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION OF IRELAND.—The annual general meeting of this Association was held in the rooms of the Royal Institute of the Architects of Ireland, 20, Lincoln-place, Dublin, on Tuesday, the 8th inst. The President, Mr. C. J. MacCarthy, occupied the chair. After the usual business was concluded the hon. sec. read the report of the committee for the Session 1900-1, and the hon. treasurer, Mr. J. H. Webb, his statement of accounts. The prizes won during the past session were then distributed by the President, the prize-winners being as follows:—A. A. I. Travelling Studentship, Mr. J. A. Rockett; Institute Prize, Mr. Charles B. Powell; Beckett Prize, Mr. L. O'Callaghan; Class of Design, 1st, Mr. W. Connolly; 2nd (tie), Messrs. J. K. Vinycomb and H. J. Leask; Class of Building Construction, 1st, Mr. H. Lundy, 2nd, Mr. W. Connolly; Technical Demonstrations, 1st, Mr. L. O'Callaghan; 2nd, Mr. H. J. O'Rourke; 3rd, Mr. F. Morley. The President delivered his inaugural address, in which he dealt with the possibility of establishing a national type of Irish architecture, giving it as his opinion that in the buildings of the Roman Catholic Church in Ireland lay the possibilities of such a movement being accomplished. The greater part of this address we print at length in another column. Mr. Joseph Geoghegan moved, and Mr. R. M. Butler seconded, a vote of thanks to Mr. MacCarthy for his very able and interesting address, which was carried with acclamation.

MANCHESTER SOCIETY OF ARCHITECTS.—On Thursday, 10th inst., the President (Mr. A. Darbyshire) opened the session with an address to the members. Briefly describing the conditions that existed when he was a pupil, the lecturer compared the position and practice of an architect of to-day with that of thirty years ago, and alluded to the great educational facilities now to be obtained by those wishing to become architects. In conclusion the President urged the students to avail themselves of their present opportunities, and spoke of the importance of the study of the human figure. In moving the vote of thanks, Mr. J. B. Gass (Vice-President) emphasised many of the points already alluded to. He also thanked the President, in the name of the Society, for the Presidential Badge bearing the arms of the Society, which Mr. Darbyshire had given them. Mr. E. Hewitt (Vice-President) seconded the vote of thanks, and Mr. Royle and Mr. Ely also spoke. The President briefly responded, and at the close of the meeting the badge, which is an artistic piece of jewellery, was handed round for inspection. It is oval in form and is a reproduction of the seal of the Society in gold and enamel, having the City heraldry correctly

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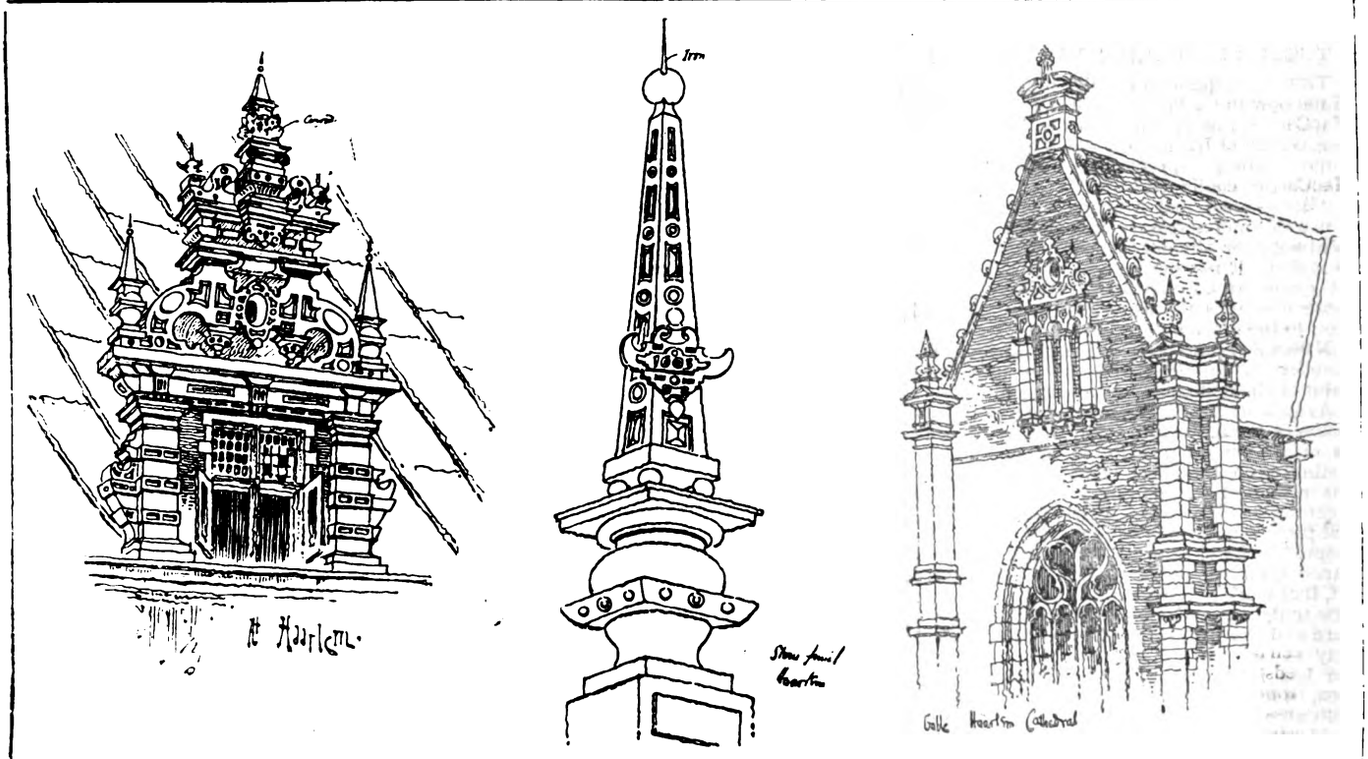

Sketches at Haarlem. By Mr. J. H. Coram.

emblazoned. The title of the Society surrounds the device setting forth the date of incorporation. The reverse will have the date of the gift engraved on it.

The prizes offered to students of the Manchester Society of Architects who have been working at the Technical School and School of Art during the past session have been awarded by the Council as follows:—Mr. C. G. Agate, first prize value ten guineas; Mr. J. W. Ramsbottom, second prize value five guineas.

SKETCHES AT HAARLEM.

These sketches, from a set by Mr. J. H. Coram, illustrate some of the peculiar characteristics of Dutch Renaissance detail. The dormer window is a very amusing specimen, not certainly to be recommended for imitation, but with a kind of fine unconscious humour about it.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A Midland Counties District meeting of the members of the Association of Municipal and County Engineers was held at Nuneaton on Saturday, October 12. The members of the Birmingham Association of Students of the Institution of Civil Engineers attended by invitation. The President (Mr. E. G. Mawbey, Leicester) took the chair, and among those present were Messrs. J. T. Eayrs, Birmingham; J. Wilcox, Birmingham; S. R. Lowcock, Birmingham; A. D. Greatorex, West Bromwich; Berrington, Wolverhampton; J. Lobley, Hanley; Scourgie, Rotherhithe, J. Price, Birmingham; W. Lacey, Oswestry; Dawson, Banbury; Smith, Kettering; and others.

Councillor Horton, in welcoming the members of the Association, expressed the hope that the meeting might be interesting, instructive, and enjoyable.

The President, in acknowledgment, said there were exceptionally important and valuable works for the members to see at Nuneaton. There were few districts which had had greater difficulties to contend with in respect of sewage disposal, and the very admirable way in which they had grappled with and overcome those difficulties deserved all praise. The sewage was a very strong one, yielding over 20 tons of pressed cake per 1,000,000 gallons. The volume of sewage was also large, averaging 750,000 gallons per day for the population of 20,000, served at the present time.

Mr. J. S. Pickering, A.M.Inst.C.E., engineer and surveyor, read a paper on "Municipal Work in Nuneaton." He said the town ranked amongst the most important manufacturing towns in the Midlands, and its rapid growth seemed to point to a still greater future in importance. It had excellent railway accommodation, and its industries were of a very varied character, comprising collieries, brickworks, stone quarries, sanitary-pipe works, hat factories, iron foundries, fellmongers' works, worsted-spinning, plush, elastic web, ribbon, and other factories. The urban district comprised Nuneaton, Chilvers Coton, Attleborough, and Stockingford, an area of over 10,000 acres. The population in 1891 was 15,246, and the recent census showed it to have increased to 24,995. The rateable value was 100,078*l*.

The Council were now considering the desirability of obtaining a charter of incorporation. The total length of roads repairable by the Council was about thirty-seven miles. Ten and a quarter miles of these were main roads, towards the maintenance of which the County Council contributed 1,700*l*. per annum, under an agreement made for a term of three years.

Tar-macadam roads were made with success, and it was proposed to adopt this type of road more extensively. A road so constructed possessed all the advantages of an ordinary macadamised road, and the additional advantages of wearing longer, being more sanitary, and requiring less scavenging and watering. A tar-macadam road could be made complete for about 2s. per super yard, with 3 in. of macadam as foundation and 1½ in. of chippings as topping, including cost of material, cartage to depôt, heating and tarring material, scarifying road and removing old macadam, cartage from depôt, laying and steam-rolling. Concrete slabs for footpath paving were made by the Council, and could be produced of equal quality to any purchased and at a less cost.

New streets were invariably made and completed (with the exception of the footpath pavements) and taken over by the Council before being built upon; consequently, the usual disagreeable proceedings and disputes inseparable from the compulsory making-up and apportionment under the Public Health Acts were avoided. The drainage of the district was carried out on what was known as the "separate" system. The total length of main sewers (apart from surface water drains) was about fourteen miles, and a further length of four miles was about to be laid for the drainage of an outlying district, and to receive the sewage from a portion of the district of the Atherstone Council, which it had been decided to receive and treat for a period of thirty years at 5d. per 1,000 gallons.

A large number of 6-in. ventilating shafts had been provided for ventilation and the street gratings closed, and this system was adopted in all extensions. A provisional order had been obtained by the Nuneaton and District Light Railways Company for the construction of about 8½ miles of electric tramways on the overhead trolley system. The Council purchased the undertaking of the East Warwickshire Waterworks Company in 1897 for 30,000*l*., the Company relinquishing 10,000*l*. of their capital for the benefit of the town. Since then a further capital of 35,000*l*. had been expended on a new pumping station, filter beds, an additional reservoir, and in extending the mains. The works had been designed and carried out by the author. Considerable difficulty had been experienced in obtaining a water supply. Two deep wells sunk by the late company in the permain strata yielded an insufficient supply, but contained a useful reserve of water which could be utilised in case of emergency. In sinking two new shafts for coal Messrs. Stanley Bros. met with so large a quantity of water that they had to be abandoned, and these had been acquired by the Council, together with three Lancashire boilers, chimney-shaft, and a site of two acres of land for a pumping-station. The water from these shafts was used to supply the district. The erection of the pumping machinery and the new engine-house were now nearing completion. The engines and pumps were in duplicate, and each set was capable of raising 50,000 gallons per hour from a depth of 130 yards and delivering the water to the filter-beds under a head of 120 ft.

The consumption of water was about 400,000 gallons per twenty-four hours. The quantity used for domestic purposes worked out at an average of thirteen to fourteen gallons per head of the population supplied. The head of water in the town was 200 ft.

The question of sewage disposal had been a very difficult problem, particularly on account of the foul character of the sewage, due to the waste liquors from the wool scourers, fellmongers, and hat factories. The existing sewage works were in close proximity to the town, and occupied a site of about six acres. For many years the process of treatment was chemical precipitation and artificial filtration. The results were not altogether satisfactory, and the working expenses were very high. Moreover, the Local Government Board refused to sanction any loan for extensions without the acquisition of land for filtration purposes, and this was not available in the neighbourhood of the works. Upon the introduction of the bacterial system some few years ago it was decided to make a trial of the process. This proved so satisfactory that the treatment was applied to the whole of the sewage, with the result that a very considerable saving had been effected in working expenses. After passing through a screening

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chamber the sewage flowed into a pump well 50 ft. in depth. From this it was pumped and delivered into two roughing tanks, each 13 ft. deep and 20 ft. diameter. The sludge deposited in these tanks was lifted automatically to within 2 ft. of the surface by the pressure of sewage. It was then dealt with in two of Johnson's sludge presses.

The sewage then flowed into open septic tanks or coarse contact beds. There were three open tanks, each of a capacity of 120,000 gallons. There was an area of 1,708 yards of coarse contact beds, and in order to test various materials they had been filled with coke, macadam, broken pots, ashes, and broken bricks. A portion of the sewage was treated in a closed septic tank having a capacity of 120,000 gallons. From the open and closed tanks and the coarse contact beds the sewage passed into fine contact beds, of which there was an area of 3,564 yards, varying from 3 ft. to 5 ft. in depth, and composed of coke dust, coke breeze, small coal, and fine granite chippings. From the fine grain beds the effluent passed direct into the river.

Most of the contact beds had been made in excavation with artificial walling, the subsoil being a strong marl. There was no objection to this course if the beds were made watertight, but should they leak from one to the other they were a source of trouble, and the results were not satisfactory. Some of the beds had been in operation for over two years. The coke beds give the greatest liquid capacity, but there appeared to be no appreciable difference in the result as regards the various materials composing the beds. The deep roughing tanks had been found most serviceable for intercepting the grit and other heavy matter. One of these tanks had been in regular use for over four years, and had not been emptied during this period. The closed septic tank had been in use for over two years and had not been emptied. It had liquefied (as far as could be ascertained by measurement) about 95 per cent. of the suspended matters passed through it. The open septic tanks had been in operation thirteen months, and it had been found necessary to empty them and remove the sludge once during this period. One tank was emptied after seven months' working, another after eight months', and a third after nine months', the sludge from the three tanks producing about 320 tons of pressed cake. Whilst, however, the closed tank had dealt with a daily flow of sewage equal to about 50 per cent. of its capacity, the open tanks had dealt with a daily flow equal to 150 per cent. of their capacity. Both the closed and open tanks had done excellent work, particularly when the unusually large quantity of suspended matter in the sewage was taken into consideration. It appeared to be generally considered an essential part of an open septic tank that a coating of scum should be formed. After thirteen months' working, however, the surface of the sewage was only partially covered with scum, but the process of liquefaction had certainly been in active operation. It was remarkable how quickly a coating was formed by covering a tank, which had been in use some months, with a light roof of boards. In less than twenty-four hours a scum several inches in thickness was formed. He was of opinion that the treatment of sewage in open septic tanks could not be carried on without nuisance. This might not be a serious objection to their use in some places, but it should be borne in mind. The treatment in a closed septic tank was not nearly so offensive as in an open tank, but the effluent from a septic tank had a most offensive odour when put on to the fine grain beds. In designing either closed or open tanks the fact that the deposited matter must sooner or later be removed and treated should not be overlooked. His experience was that the least offensive method of applying the bacterial treatment was by the Dibden system of coarse and fine contact beds. There was no serious nuisance produced by applying the raw sewage in a fresh state to the coarse beds, and no offensive odours were given off during the periods in which sewage was in contact with the material. The beds were so free from offensive smells that it was found impossible, as a rule, by walking over them to detect which were at rest and which were working.

It seemed to be generally agreed that about two hours was the proper time for the sewage to remain in contact with the material, and this was his experience with the sewage of a manufacturing town. He was of opinion that the most important matter in connexion with bacteria beds was the question of their reduction in treating capacity, owing to choking up. He had not yet been able to agree with the opinions expressed by some authorities that after reaching a certain stage the capacity of the beds should remain undiminished. The present sewage works having become inadequate to properly deal with the increasing volume of sewage, an entirely new scheme of sewage purification was being carried out by the author. The existing outfall works would be utilised as a pumping station and for the treatment of storm water. The sewage would be pumped to the new site, a distance of about 2½ miles. After screening it would pass through detritus tanks, and thence through coarse and fine grain bacteria beds, and finally purified by filtration through land. The estimated cost of the works was 45,000*l.* The new works to meet the requirements of the Local Government Board were designed to treat a million and a half gallons per day, or three times the dry weather flow.

Upon reaching the new site the sewage would pass through two revolving wire screens 5 ft. in width, having ¼-in. square meshes.

Upon leaving the screening chamber the sewage would flow through three covered tanks of the "Dortmund" principle, which were each 34 ft. deep and 24 ft. in diameter, with a combined capacity of 150,000 gallons. These tanks were intended to intercept the heavy mineral matter, which would be automatically discharged by pressure of sewage in the tanks through a line of 9-in. pipes 450 yards in length to the irrigation area, where it would be delivered into furrows, and deodorised with soil until it finally became incorporated with the land. From the detritus tanks the sewage would be conveyed to the coarse-grain bacteria beds.

Each bed was provided with three inlets, and at each of these a fine screen would be placed This special screening by large quantity of wool fibre in the sewage. The sewage would be distributed over the beds by means of open-jointed socketed pipes laid over the material. The material for the coarse beds would be broken granite about 2½ in. gauge. After contact in the coarse beds the effluent would be conveyed to the fine grain beds, which would be composed of screened coke dust. This material, although somewhat finer than that generally used, had been found to answer admirably at the present outfall works. From the fine grain beds the effluent would be discharged on to the land, an area of sixty acres having been acquired for this purpose.

Mr. J. Price, Birmingham, moved a vote of thanks to Mr. Pickering for his paper, which was seconded by Mr. Berrington, of Wolverhampton.

Dr. Bostock Hill, Medical Officer for Warwickshire, said the question of septic tanks was one of great interest to all engaged in the treatment of sewage. Although the sewage of Nuneaton was one of the strongest he had ever come across, it was admirably adapted for bacterial treatment. It was strong organically, consisting largely of refuse from woolscourers and fellmongers, and was better dissolved than a weaker sewage. With respect to the choking up of the beds, it was certain that with sewage which contained a fair amount of suspended matter the filters would in time get blocked up. Therefore, it would be advisable to make arrangements for getting over this difficulty.

Mr. A. D. Greatorex, West Bromwich, spoke of the necessity of fixing a meter to all bacteria beds so as to have accurate information as to the amount of the choking up of the beds.

Mr. Watson, Birmingham, thought it would be rather misleading to students present to take Mr. Pickering's dictum that open septic tanks could not be carried on without nuisance as applying to every place. Since he had had charge of the largest sewage purification works in the country, he had introduced open septic tanks, and had passed 25,000,000 gallons of water a day through them without nuisance, and with considerable success.

Other members having spoken, the vote of thanks was passed to Mr. Pickering for his paper.

The members then paid a visit to the blue brick and sanitary pipe works of Messrs. Stanley Bros., Limited, where they were entertained to luncheon, and the afternoon was devoted to an inspection of the new sewage disposel works. On returning to Nuneaton, Mr. Pickering entertained the members to tea.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications under the 1894 Building Act were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage and Projections.

Hammersmith.—Buildings on the site of Nos. 283 to 305 (odd), King-street, Hammersmith (Messrs. Boehmer & Gibbs).

Woolwich.—Two-story bay windows in front of Nos. 25, 27, and 29, Westmount-road, Eltham (Mr. G. F. Logsdail on behalf of Mr. A. Cameron Corbett, M.P.).—Consent.

Holborn.—An enclosed gangway across Onslow-street, Holborn, to connect No. 87, Farringdon-road with a building on the west side of Onslow-street (Messrs. Lander, Bedells, & Crompton on behalf of Messrs. Falk, Stadelmann, & Co.).—Refused.

Formation of Street.

Hackney, North.—Refusal to sanction the formation or laying-out of a new street for carriage traffic to lead from Mount Pleasant-lane to Comberton-road, Hackney.

Width of Way.

St. George-in-the-East.—Widening of parts of Langdale-street, James-street, and Samuel-street, Stepney, to a less extent than the prescribed distance, and also the erection of buildings in those streets at less than the prescribed distance from the respective centres of such streets (Mr. H. H. Collins on behalf of Messrs. N. & R. Davis).—Refused.

Means of Escape from Top of High Buildings.

City of London.—On the top story of a block of offices known as Finsbury-pavement House, Finsbury-pavement (the upper surface of the floor of which story is above 60 ft. from the street level), for the persons dwelling or employed therein (Messrs. Davis & Emanuel).

Finsbury, East.—On the fifth floor of a warehouse building in course of erection at No. 88, Old-street, St. Luke (the upper surface of which floor will be above 60 ft. from the street level), for the persons dwelling or employed therein (Mr. A. Gordon).

The recommendations marked † are contrary to the views of the Local Authorities.

THE LONDON COUNTY COUNCIL.

THE weekly meeting of this Council was held at Spring-gardens on Tuesday, Mr. Torrance, Chairman, presiding.

Loans.—The following loans were granted: —2,110*l.* to Battersea for extension of municipal buildings and 6,000*l.* for electric light installation; 4,500*l.* to Poplar for sewerage works; 20,000*l.* to Shoreditch for purchase of land for housing scheme; 4,000*l.* to Stepney for purchase of plant for street watering and sweeping; 3,300*l.* to Kensington for street lighting purposes; 31,320*l.* to St. Pancras for baths and wash-houses.

The Works Department.—On the recommendation of the Finance Committee 10,000*l.* was voted to the Works Department for the purchase of timber.

Engineer's Department.—The Establishments Committee reported the receipt of the resignation of Mr. Edward Bazalgette, District Engineer. It was accepted, and a retiring allowance of 413*l.* 6s. 8d. a year agreed to.

The Piccadilly Improvement.—The Improvements Committee submitted a Report on the circumstances which led to the postponement of the projected Piccadilly improvement. With regard to the alleged intention of the Council to destroy at least sixty trees, the Committee stated that the statement was erroneous; in fact, from the inception of the scheme the Committee never contemplated such an act of vandalism. The Council's plan provided that nearly all the trees should remain untouched on the edge of the new footway, the necessary space being left around them to entirely secure their roots against damage. If the formal consent of the First Commissioner of Works be given within two or three weeks, the Committee proposed to direct the Manager of the Works Department to put the work in hand at once.

Staple Inn.—The Local Government and Taxation Committee reported having received from the Commissioners under the London Government Act, 1899, copies of the Borough of Holborn (Staple Inn) draft scheme. This scheme was similar to those affecting Gray's Inn, Lincoln's Inn, and St. Peter, West-

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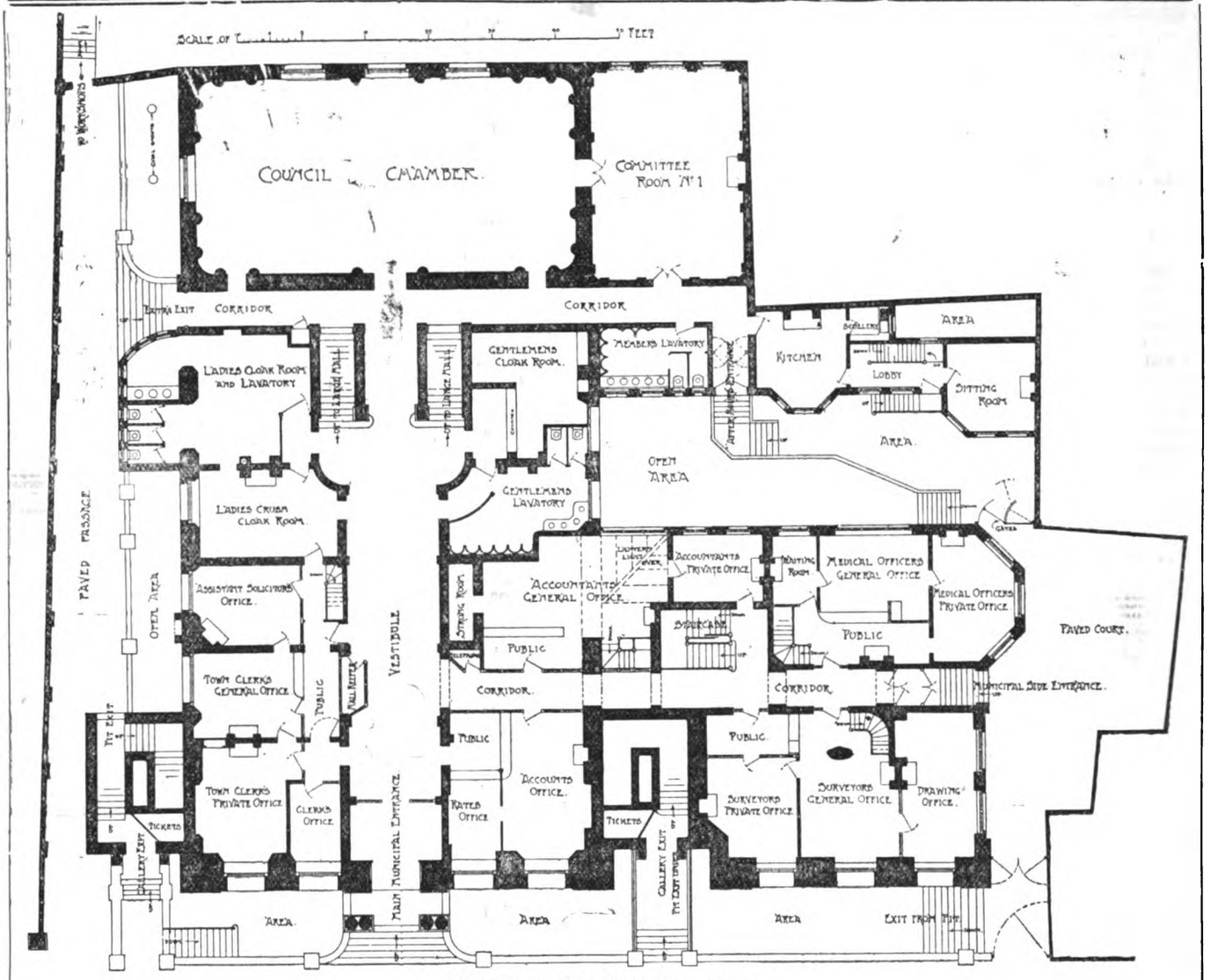

New Town Hall, Shoreditch. Plan.

minster, as far as relates to the levy of the general rate throughout the Inn, to the transfer of the sewers to the Borough Council, and to the retention of the roads under the control of the owners of the Inn. The removal of house refuse was, however, not left to the owners, and instead of the amount to be recovered from the Borough Council in respect of roads being left to agreement or arbitration, the amount was fixed in the Staple Inn case at 50*l.*

The scheme, with the suggested addition of a qualifying word, was approved.

Epileptic Colony.—The Asylums Committee reported that they had accepted the following tenders for work at the Epileptic Colony, namely :—

Electric Light Installation.—Messrs. Benham & Sons, Ltd.	£6,252	15	7
Boilers, Pumps, and Fittings.—Messrs. Babcock & Wilcox, Ltd.	1,170	0	0
Cooking Apparatus.—Messrs. Murwood, Sons, & Co., Ltd.	918	0	0
Fencing.—Mr. R. Mulford (estimated total)	1,052	0	0

The four contracts taken, amounting to 9,393*l.*, exceeded the Asylums Engineer's estimate for these works (9,150*l.*) by 243*l.*, but there was sufficient provision in the amount allowed in the vote for contingencies to cover the excess.

Housing Schemes.—Lord Welby stated that the Home Secretary, in conjunction with the Local Government Board, was considering various questions connected with the housing of the working classes, and that he would be ready to receive a deputation from the Council when Ministers meet later in the autumn.

LECTURES AT CARPENTERS' HALL.—We are requested to state that the Worshipful Company of Carpenters' examinations on "Sanitary Building Construction" will be held at Carpenters' Hall, London Wall, on November 21 and 23, and not on the dates given in the advertisement in our last issue.

Illustrations.

NEW TOWN HALL, SHOREDITCH.

THIS building, still in progress, is the latest of the new District Town Halls of London, of which no doubt other examples will follow as the local municipal work in the various districts becomes more important and extensive, and calls for greater accommodation.

In the case of Shoreditch it was at first thought that the old building, which, from a political and social standpoint, is historically interesting, should be adapted to modern requirements, but this was found to be impossible, and it was finally decided to buy an adjacent site, upon which should be built an entirely new structure in consonance with the architectural outline of the old one. Competitive designs were publicly invited from architects, and those submitted by Mr. William G. Hunt, of London, were placed first by the assessor and ultimately adopted by the Council.

The work has now been in hand some time, and the façade, which is in best brown Portland stone, is about one half built. The statue in the niche of the tower is to be symbolical of "Progress."

The floors throughout are of fire-resisting construction ; an interesting incident in connexion therewith is the fact that the residue from the Borough Council's own destructor, mixed with cement and sand, is utilised for forming the concrete in such floors. Considerable difficulty has been experienced with the foundations of some of the old walls which are intended to re-used and raised upon, the lower portion of the concrete foundations being found to be very unsound, which may possibly have been caused by the original lime concrete having been thrown into trenches containing matter which prevented its setting.

All the principal Administration Departments are arranged on the ground floor and are self-contained, each having its own distinct store, record and plan rooms, and lavatories in the basement approached by separate secondary staircases direct from each department. This system has been adopted by the architect in another London town hall, and is found to be of considerable convenience in the prompt and expeditious conduct of municipal business, besides the saving of much valuable ground floor space for more important purposes. The first floor is occupied by the large hall and several committee-rooms (one of them being 43 ft. by 22 ft.), with councillors' lavatories, &c.

The heating is by hot air in the large hall and council chamber ; hot water radiators in corridors, &c. ; and by ventilating grates in the offices.

The quantity surveyors are Messrs. Raven & Crickmay, and the builders Messrs. Killby & Gayford.

It is not our usual custom to enter into criticisms of the designs and plans that we publish, but we fear that in the present instance we cannot omit a strong comment in regard to the manner in which the ladies' and gentlemen's cloakrooms are planned ; the door of the ladies' crush-room immediately facing that of the gentlemen's lavatory on the other side of a not very wide passage. Such an arrangement is worse than unsuitable ; it is hardly decent. Attention has been so often directed in our columns to the importance of arranging such rooms so as to keep their entrances completely separated from each other, that we really cannot pass over such an arrangement as this without remark.

CLAREMONT CONGREGATIONAL CHURCH, BLACKPOOL.

THE plan shows the complete scheme of the building. At present only the nave, tower, and vestries are built, leaving the aisles, school-hall, and classrooms to be added later.

The walls are of brick, faced with local stone parpoints and York stone dressings. The roof

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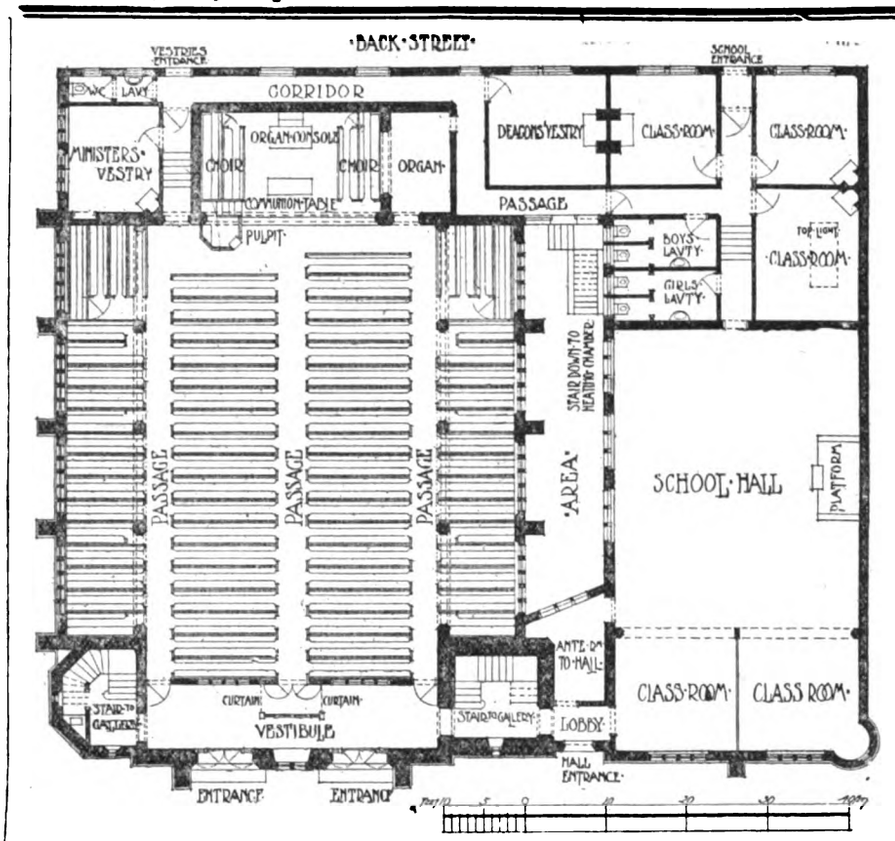

Claremont Congregational Church, Blackpool. Plan.

principals are of steel covered with moulded wood ribs and lined between with wood to the form of a pointed vault. The wood dado in the nave is of lining, and the chancel is panelled to a height of 8 ft. The seatings and finishings are of pitch pine, and the pulpit is of oak.

The church is lighted by electricity, and heated by means of hot-water radiators. Seating accommodation for about 440 is provided meantime, but the completed church will seat about 640. Externally the roofs are covered with red tiles, and the whole building is to be surrounded by an open oak paling.

The architects are Messrs. Anderson, Simon, & Crawford, Edinburgh, and the contractor for the general work is Mr. T. H. Smith, Blackpool; carving in wood and stone by Mr. J. J. Millson, Manchester; metal work by Messrs. Thos. Brawn & Son, Birmingham; heating by Messrs. W. Richardson & Co., Darlington; electric lighting by Mr. John Coulson, Blackpool.

The total cost of the church amounts to about 5,300*l.*

NEW PAROCHIAL BUILDINGS, ST. JAMES-THE-LESS, BETHNAL GREEN.

THE small and inconvenient buildings in which the day schools in this parish were carried on have been superseded by new day schools and parish hall. A part of the site was previously occupied by the boys' school and playground, and the remainder formed part of the churchyard.

Over this a crypt was formed, in accordance with a faculty, and above the crypt a floor of steel joists and concrete covers nearly half the area of the new buildings. These consist of the parish hall, surrounded by five classrooms, which can be thrown into it by sliding back glazed screens, and affording sitting for 1,000 persons.

Girls' and infants' schools are accommodated in these and other classrooms on the ground floor, the boys' school being on the first floor with a separate entrance and staircase. The upper floor contains cookery school and drawing school in the eastern wing, and gymnasium in the western wing.

Red Staffordshire bricks have been used for facing, and Portland stone for dressings. The roofs are covered with red tiles, and copings, mouldings, and panels of moulded brick have been introduced. Two staircases of artificial stone flank this hall and give access to all floors.

Stained-glass and ornamental lead-glazing has been introduced in hall windows and marble mosaic paving in entrance corridors. The churchyard has been laid out as a recreation-ground.

Mr. E. Hoole is the architect, and Messrs. Coulsell, of Bethnal Green, are the contractors. The heating apparatus is by Messrs. Jones, the electric lighting by Messrs. Sunderland, the gas fittings by Mr. Harris, and the stained-glass by W. Whall, Esq.

Laminated arched ribs have been employed in the roofs of the parish hall and gymnasium, and tie beams and buttresses have consequently been dispensed with.

The total expenditure has been 16,000*l.*

"HYLAS": DESIGN FOR STAINED GLASS.

THIS is a reproduction of a cartoon for stained glass which gained for the artist, Miss Geraldine Morris, a medal in what is called the "National Art Competition" in connexion with the Department of Science and Art at South Kensington.

We are always glad to meet with stained glass treating in an effective manner subjects which are suitable for secular or domestic buildings, as the art has been too much studied as if it were mainly applicable to churches. We cannot help observing, however, that Miss Morris's treatment of the legend of Hylas, a subject essentially Greek, is entirely devoid of Greek feeling; the "nymphs" are mediæval nymphs, not Greek ones. It would have been better to give it another title.

COMPETITIONS.

NORTH LONDON HOSPITAL.—The Committee of Management of the North London Hospital for Consumption having asked five well known hospital architects to compete for the erection of their proposed Country Branch and Convalescent Home at Northwood, Middlesex, have selected the design submitted by Mr. Frederick Wheeler, of 6, Staple Inn, W.C.

THE LAND REGISTRY.—An amended Parliamentary return has just been issued in substitution for the annual returns of which we published an abstract in our issue of September 21. It seems that the returns were at fault in respect of the number of leasehold estates the titles to which had been registered upon first registration. The number of such estates was stated to be 781; the number should have been 8,781, according to the corrected return.

Books.

The Construction of Roads and Streets. By HENRY LAW and D. K. CLARK, MM.Inst. C.E. Sixth Edition, Revised, with Additional Chapters, by A. J. WALLIS-TAYLER, C.E. London: Crosby Lockwood & Son. 1901.

AT a time when so much attention has been—and is likely to be—devoted to the question of road-making and the renewal of street pavements, the appearance of the present volume is distinctly opportune. As to the new form in which it is produced there is less reason for congratulation. The original work, written by the late Mr. Henry Law and Mr. D. K. Clark, two well-known civil engineers, was recognised as a thoroughly practical and trustworthy guide, although of late years it could not be regarded as applying in many respects to modern practice. As the preface remarks, "The original authors being both dead, it became necessary to entrust to another hand the duty of bringing it up to date," and the publishers consider themselves fortunate in securing the services of Mr. Wallis-Tayler for the performance of that duty. It is presumably intended to be inferred that this good fortune is due to the intimate acquaintance of the present editor with road-construction, but we are bound to admit that we have no knowledge of his qualifications in this direction, except such as may be gathered from the revised edition of the work now before us. We are by no means satisfied as to the desirability of "bringing up to date" the works of authors who are deceased. If preserved in their original condition, the productions of past generations are frequently useful as indications of the stepping-stones by which knowledge has been gradually attained, and they can seldom be adequately modernised without showing signs of patching, or without being "improved" out of all recognition. Examples demonstrating the correctness of this general criticism are, unfortunately, not lacking in the departments of architectural and engineering, as well as of literary work. As for the case in point, we feel sure the public would prefer a new treatise from an expert in modern road-making to the altered and re-decorated version of an old one.

Mr. Wallis-Tayler has been considerate to the original authors. The prefatory "Historical Sketch" by Mr. Clark, and Part I., on the "Construction of Roads," by Mr. Law, are reproduced practically without alteration, and comparatively little evidence is to be found in Part II., on "Recent Practice in the Construction of Roads and Streets," of the "careful revision throughout" promised in the preface. Consequently, the work is not adequately modernised. As an example we may take the first chapter of Part II., describing the "Materials Employed in the Construction of Roads and Streets." No objection can be taken to the original discussion by Mr. Clark of mineral substances, for very little that is new has been learnt about them, but one might expect some recent information as to timber under the sub-heading of "Wood." There is no mention whatever here of the Australian and other woods now so largely employed for street paving, and the tables relied upon to demonstrate the crushing resistance of timber and the endurance of wood-paving are dated 1877 and 1844 respectively. In the next chapter, on "Modern Macadam Roads," some remarks are made as to modern practice in connexion with metropolitan and country roads. These carry the subject beyond the stage reached by Mr. Law in the first part of the work. Nevertheless, it is somewhat curious to find that the most recent development described under the head of "Modern Practice" is an improved country road proposed in the year 1875 by a committee of the Society of Arts. Some details as to the wear and cost of macadam roads are next stated. These are interesting, but eminently archaic, being based upon reports and tables prepared between the years 1831 and 1876, and the price of road metalling quoted is that which prevailed a quarter of a century ago. The value of the data given is further diminished by the fact that they were obtained at a period when the steam-roller was not used in this country. Concrete roads laid in the years 1865-70 are discussed in a brief chapter from which no definite conclusion is to be drawn; and a short

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dissertation follows on macadamised roads constructed in France about the year 1843. In none of the foregoing chapters do we find the slightest trace of the modernisation promised in the preface to the present edition. The same criticism applies to the sections dealing with stone pavements in London and elsewhere. Various forms of wood pavement receive more appropriate attention, and here the hand of the editor may first be observed in the renovation of old material. Prominence is properly given to the principal hard woods employed at the present time for paving purposes. According to Mr. Richards, of Sydney, jarrah and karri are not to be compared with the tallow and blackbutt woods of New South Wales, and it is important to note that the blackbutt imported to this country is the Victorian variety, which is less suitable than the former type. Mr. Richards considers tallow wood to be the best for paving purposes, whilst blue gum is said to be fully capable of holding its own, blackbutt and red gum coming next in order of superiority. Some interesting particulars are quoted as to the forest resources of Western Australia, the authorities being the Conservator of Forests and Sir Malcolm Fraser, the Registrar-General for the Colony. The editor's remarks upon the various processes incidental to the formation of wood pavements appear to be based upon papers contributed in 1884 to the Institution of Civil Engineers by Mr. G. H. Stayton, formerly of the Public Works Department, Sydney. The superiority of hard woods is wisely emphasised, and soft-wood blocks are properly characterised as unsanitary and expensive. The editor also advocates the adoption of creosoting or other preservative processes, not so much for the increase of durability as for rendering the timber less absorbent and therefore less likely to conduce to unsanitary conditions. This recommendation is worth attention, but the method of treatment adopted should certainly be one that removes none of the natural constituents of the wood, or its last state will be worse than the first.

Passing over the two succeeding chapters, which deal with matters of rather ancient history, we come to a collection of modern opinions on hard wood pavements. Some valuable particulars are quoted from a paper communicated to the Institution of Civil Engineers in 1893 by Mr. W. A. Smith, of the Bridges and Roads Department, Sydney; the "Proceedings" of the Municipal and County Engineers' Association are also freely laid under contribution; and the conclusions of some metropolitan surveyors are stated. All these constitute useful additions to the original treatise, and the editor's own remark that wood paving "should, to ensure sanitary conditions, be kept in a state of scrupulous cleanliness" may well be commended to the authorities, who seem to be impenetrably ignorant of this self-evident necessity. On the subject of preserved wood pavement the only satisfactory report quoted is one by the Surveyor to the Vestry of St. Martin's-in-the-Fields, dealing with carbolised wood blocks as applied in Northumberland-avenue and elsewhere in that district. "Other Wood Pavements" are described in a more or less historical manner, none of the records relating to a later period than 1876, except that of Duffy's dowelled pavement, adopted by Sir J. Wolfe Barry for the roadways of the Tower Bridge. The practical value of this pavement for ordinary use still remains to be completely demonstrated. There is a good deal of old matter in the chapter on the cost and wear of wood pavements, but at the same time some recent references are to be found, and a series of tables by Mr. Stayton contains much useful information, though a little out of date.

Chap. xix., on "Asphalt Pavements," furnishes a complete account of the different forms in which this excellent material is found in Nature and employed for the purpose of paving. Speaking of sheet asphalt paving, the editor does well to point out that "the concrete foundation is in reality the paving itself, the upper stratum .... being only the wearing surface," the duration of the road surface depending largely upon the quality of the foundation and upon the internal combination of the upper layer with its foundation bed. Several patented combinations of rock and Trinidad asphalts with other substances are described, most of these being manufactured in the form of blocks, but very few appear to have proved satisfactory. We observe that the questions of cost and upkeep are judged almost entirely by the aid of tables contained in a report by Colonel Haywood, dated April 18, 1873. Surely more recent data should be available by this time. A new chapter on "Brick Pavements" is only interesting in a limited sense, because the material is never likely to come into general use for the paving of roadways in this country. When the comparison of carriageway pavements is reached, much difficulty is experienced in deciding whether the estimates and statistics are those of the reputed author or the ostensible editor. Most of the tables printed date from 1873, and are evidently to be attributed to the hand of Mr. Clark. Statements of cost are given without any clear indication as to whether they be half a century old or of quite recent origin. This is a most serious objection, applying to a greater or less degree to the whole of the present edition. Such words as "the author," "recent practice," "modern practice," "now," &c., and the present tense are used generally without the slightest definition of the person or the period denoted. Whether it is desirable to attempt the rehabilitation of an old work is a matter of opinion; but if the thing is to be done at all, it should be carried out in a clear and intelligible way.

Chap. xxiii., presumably by the editor, deals very fully with footpaths and crossings, and will repay perusal. The remaining chapters are essentially those written by the original author, and so require no comment. A series of four appendices and an ample index bring to its conclusion an edition which, the preface says, cannot fail to prove of augmented usefulness and value. We believe it would better justify this prophecy if carefully revised.

Sewage and the Bacterial Purification of Sewage. By Samuel Rideal, D.Sc. (Lond.), F.I.C., F.C.S., &c. Second Edition. London: The Sanitary Publishing Company, Limited. 1901.

The preface to the first edition of this book was dated May, 1900, and that of the new edition June, 1901. That a new edition should be required in little over a year must be gratifying to the author, but, as we pointed out in our review of the original work, Dr. Rideal deserved success, for his book is one of the best accounts of modern methods of sewage treatment. The scope of the book is wider than is indicated by the title on the title-page, and is better shown by the title on the cover—"Sewage and Sewage Purification"—or the running title in the text—"Sewage and its Purification." One or two small matters to which we drew attention have been corrected in the new edition, and additions, amounting in the aggregate to thirty pages, have been made in nearly every chapter. Dr. Rideal mentions the third report of the London County Council, and also the interim report of the Royal Commission on sewage disposal, but has not found it necessary "to alter the statement of principles" contained in the first edition, nor has he modified the favourable conclusions regarding bacterial treatment which he there expressed. He distinguishes the stages of purification as follows: — *Initial*, transient aërobic changes by the oxygen of the water supply; *first stage*, anaërobic liquefaction and preparation by hydrolysis; *second stage*, semi-anaërobic breaking down of the intermediate dissolved bodies; *third stage*, complete aëration, nitrification. His opinion of Dr. Houston's last report to the London County Council is thus stated: Dr. Houston's "conclusions must, however, be regarded as only applicable to beds worked in the way described. The chemical results taken generally show that nitrification was never pushed to a satisfactory point, and the main object of the whole inquiry in London has been to produce an effluent suitable to discharge into tidal waters." Dr. Rideal believes that bacterial treatment "conducted in regular sequence" will deal not only with domestic sewage, but also "with all ordinary manufacturing admixtures." We can heartily recommend the book as a learned and lucid treatise of great practical value.

The Sanitary Inspector's Handbook. By Albert Taylor, M.San.Inst., &c. Third Edition. London: H. K. Lewis, 136, Gower-street, W.C. 1901.

We have already spoken favourably of an earlier edition of this work, and the new edition is still more worthy of praise. It has been extended and brought up to date by the inclusion of recent Acts of Parliament, legal decisions, and departmental circulars relating to matters within the province of the sanitary inspector, and by a full account of the examinations held by the recently-constituted "Sanitary Inspectors' Examination Board." An attempt has also been made to widen the scope of the work by including in it numerous references to the Public Health (Scotland) Act, 1897, but Scottish law and procedure are so different from English, that it is very doubtful whether the references will be of any use. Indeed, we are inclined to think that they will prove misleading; for example, on page 51 the list of nuisances is copied from the Public Health (London) Act, 1891, and reference is made to Section 16 of the Public Health (Scotland) Act, 1897, but nothing is said about the important differences between the lists of nuisances given in the two Acts. To the English sanitary inspector, however, the work cannot fail to be extremely useful. Mr. Taylor has had great experience both in London and the provinces, and imparts his knowledge clearly and concisely. Special hints with respect to nuisances arising from the keeping of animals, particularly swine, would have been of service, as such nuisances are very difficult to deal with, and we trust that this point will not be overlooked in the next edition.

TRADE CATALOGUES.

Messrs. John Spencer, of Wednesbury, send us their list of iron and steel tubes for gas, water, steam, and hydraulic purposes. We are glad to observe that all tubes and fittings turned out by this firm are screwed to Whitworth's standard threads. This most important detail is not yet universal, even amongst the leading tube makers, and it is one that architects should always consider before issuing specifications. Weldless steel tubes, well tubes and tools, ventilating columns, and a variety of valves and other fittings are catalogued in the list, which is one of the most complete issued in this branch of industry.

Messrs. Knecht Brothers, of Cincinnati, send us a booklet descriptive of their friction sensitive drill-press, a light tool in which the driving mechanism consists of two cones and a friction roller. Thus the speed of the drill spindle can be altered without the necessity for stopping the machine or for shifting belts in the usual way.

Messrs. Bell Brothers and Dorman, Long, & Co., of Middlesbrough, send us a tastefully produced memoir, illustrated with photo-engravings and plans, giving historical sketches and other particulars of the extensive works established by these well-known metallurgical firms, which have lately been amalgamated. At the Britannia and West Marsh works the manufacture of iron has been entirely given up, and all material now rolled is open-hearth steel, of which a large proportion is rolled into girders. The bulk of the steel is made from Cleveland iron, partly at the Britannia and partly at the Clarence works. With the latter establishment Sir Lowthian Bell has been associated since its foundation in the year 1854. Amongst other interesting photographs are some showing the new Westinghouse works at Manchester, Messrs. Vickers, Sons, & Maxim's works at Sheffield, and bridges built for Uganda and for the Egyptian Delta Light Railway.

Messrs. Hartley & Sugden, of Halifax, send us a copy of their new catalogue of heating apparatus, boilers, and kindred appliances. Amongst these we notice several of recent design intended for hot-water and low-pressure steam-heating purposes. Some of the steam-boilers are furnished with automatic regulating devices of the kind adopted in American practice. It is worthy of comment that all the boilers of this firm are constructed of wrought-iron, and so are far less liable to failure than those of cast-iron, which manufacturers in the United States are now attempting to introduce in Great Britain.

Messrs. Keith & Blackman, of London, send us an illustrated pamphlet relating to their exhibits at the Glasgow International Exhibition. The appliances described include hot water boilers, ventilating fans, drying plant, hydraulic rams, compressors for high pressure gas lighting, &c. The system of lighting by high pressure gas was adopted in the exhibition grounds, where it proved to be particularly effective.

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Messrs. Ransome & Co., of Newark, send us a copy of their new catalogue of wood-working machinery, a very complete and well-illustrated volume, containing engravings and full descriptions of a large variety of machines, many of which appear to be made from new and improved designs. The specialities dealt with in this catalogue are suited to forestry operations and to the requirements of almost every industry in which timber forms a material of construction.

The Electric Lighting Boards Company, of 80, York-road, King's Cross, N., have sent us a well-illustrated catalogue and price-list of their manufactures. We have already favourably commented on this system of electric lighting, which is admirably adapted for many special purposes. For example, if one of their boards or strips is fixed into a dining-room table, and a standard lamp pillar of their design, with two needles projecting at the base, be placed on the tablecloth over it, the glow lamps on it will at once light up. Their lighting strip is also useful for cornices and dado-rails, doing away entirely with the necessity for lamp holders and sockets. Its most useful applications, however, are for shop-window lighting and theatrical purposes. As a strip of carrying capacity for thirty lamps can be had at 1s. 9d. per foot, it will be seen that this method of wiring is an economical one.

We have received from the General Electric Company, of Queen Victoria-street, an illustrated leaflet of their novelties for October. They show a neat little automatic telephone time-recorder, which ought to prove useful to business people, as it tells how the three minutes' time allowance for conversation over trunk lines is passing. Another useful novelty illustrated is the "Robertson Sunshine" lamp, which has been designed for lighting streets. It is a glow-lamp with a detachable opal glass reflector, so that when the lamp is burnt out the reflector can be used with a new lamp. It has two short rigid filaments in series, so that vibration ought not to have much effect on it, and as they can be used for a 250-volt supply, the cost of wiring will not be a heavy item.

Messrs. Ritchie & Co. send us a price-list of their "Lux-Cuber" condensing gas stoves. Some stoves are made to give a luminous flame, while others give a non-luminous flame. As all the heat generated by combustion of the gas is utilised, these stoves form economical and convenient heating agents for halls or conservatories. The claim of "absolute freedom from the least possible pollution whatever of the air of the room in which it (the stove) is used, and that without any chimney or flue," is absurd. A large proportion of carbon dioxide is always present in the products of combustion of coal-gas, and although a small quantity of it may be found in the liquid which condenses in the stove, the greater part of it escapes from every saleable form of condensing stove into the atmosphere of the room. These stoves are excellent for certain purposes, but we do not agree that they are suitable for use in schoolrooms. No flueless gas fire should, in our opinion, be admitted in any schoolroom or other place of assembly.

BOOKS RECEIVED.

HARDHAM CHURCH AND ITS EARLY PAINTINGS. By Philip Mainwaring Johnston. (Reprinted from the Sussex Archæological Society's collections.)

WIRELESS TELEGRAPHY: A POPULAR EXPLANATION. By G. W. de Tunzelmann. (Office of *Knowledge*.)

FILIPPO DI SER BRUNELLESCO. By Leader Scott. (George Bell & Sons.)

THE WATER SUPPLY AND SEWERAGE OF COUNTRY MANSIONS AND ESTATES. By E. Bailey-Denton. (E. & F. N. Spon.)

THIRTIETH ANNUAL REPORT OF THE LOCAL GOVERNMENT BOARD. (Eyre & Spottiswoode.)

THE JOURNAL OF THE SANITARY INSTITUTE: October, 1901. (E. Stanford.)

THE "MECHANICAL WORLD" POCKET-BOOK AND DIARY FOR 1902. 6d. (Emmott & Co.)

SCHOOL BUILDINGS, BELHELVIE, N.B.—These buildings were recently reopened, after having been extensively remodelled. The schools will now accommodate 160 pupils. A large central hall has been provided, through which the children pass to their various departments. This hall will also be a great convenience for drilling. The contractors for the works were:—Mason, Mr. William Mitchell, New Pitsligo; carpenter, Messrs. Edward & Rae, Dyce; slater, Messrs. Moir & Scrogie, Newburgh; plumber, Mr. R. Malcolm, Aberdeen; plasterer, Messrs. J. Scott & Son, Aberdeen; painter, Messrs. J. & S. Fyfe, Aberdeen. Messrs. Brown & Watt, of Aberdeen, were the architects.

Correspondence.

To the Editor of THE BUILDER.

WORKMEN'S COMPENSATION ACT.

SIR,—In your note on this subject in your last issue, October 12, you raise the question whether workmen should not be compensated for loss of health in pursuing their calling; and you instance the painter as one whose health may be seriously injured. There are probably to be found a few persons whose constitutions render them extraordinarily sensitive to lead poisoning; but as this would be evident within a few months of their beginning to exercise the vocation of painter, such persons would obviously be very foolish to persist in an occupation for which they are physically unfit.

But it is now quite well understood that, for the ordinary painter, health, so far as his employment is concerned, is entirely a matter of personal cleanliness, and of sobriety as affecting cleanliness. The man who always washes his hands before leaving his work (as all good painters do), and does not therefore contaminate his food, is as healthy a man as the joiner or mason, and, within my experience, as long lived. There could be no more cruel mistake than to undermine the painter's reliance on his own caution by placing before him the expectation that, if his health suffered by laxity in this respect, "compensation" would be forthcoming—I say nothing of the prospect of sham claims.

J. D. CRACE.

THE SAD CASE OF SIR SIMON LEACH —HIS MONUMENT.

SIR,—The remote village of Cadeleigh, not far from Tiverton, in Devon, possesses an interesting village church, the crowning glory of which is a magnificent Jacobean monument with life-size sculptured figures, surmounted by a heavy canopy, a most complete and handsome example of the gorgeous Renaissance period. The monument was erected by Sir Simon Leach, a quondam Sheriff of the County, to commemorate himself and his descendants, and in order to keep his memory green he left also a sum of money to keep the monument in repair.

Ill-fortune, however, attended the family, and it is now, I believe, quite extinct in the direct line. The family mansion is a humble farmhouse, and the money that was left to keep the tomb in repair, although invested in land, has been allowed to lapse, for the incredible reason that no trouble was taken to collect the rent in the sleepy meridian of the last century.

When I saw the tomb a few weeks ago it was doomed to destruction. The canopy was falling backwards, and was endangering the fabric of the church, and in a fortnight for safety's sake was to have been removed. For the time being the parish authorities are holding their hands, while I am doing my best to arouse interest in what is the finest example of the period in Devonshire.

The tomb commemorates a Devon worthy, and it will be a standing reproach if it be destroyed or allowed to be removed from the church in which he worshipped, and in which he desired to rest with his wife and children. The cost of underpinning and preserving the monument will be only 80*l.*, of which about 25*l.* has been promised.

The parish is very poor and the population small. May I appeal through you to the many lovers of the ancient and picturesque relics of our country for help in the work of preservation. It is not desired to restore, only preserve. Many Devonians in London will, I am sure, send a small subscription for the sake of the old county; the most trifling sum will be gratefully received by Miss Chichester, Calverleigh Court, Tiverton, or by

PRESCOTT ROW.

The Homeland Association, 24, Bride-lane, Fleet-street, E.C.

WREN'S CITY CHURCHES.

SIR,—I much regret that the materials of any of Sir Christopher Wren's beautiful churches should be sold by auction, probably for very nominal sums, and would suggest that they should be removed and rebuilt on suburban sites, where churches are required. This would not only avoid the loss of these excellent churches, but would probably prove economical. The proposed demolition of the church of St. George, Botolph-lane, to which you refer, would afford a good opportunity for carrying out this plan.

C. B. A.

"ROMANO'S" RESTAURANT, STRAND.—This property—Nos. 390-400, Strand—was erected as the Café Vaudeville, after Mr. W. Emden's designs, in 1894-5, for Mr. A. N. Romano, lately deceased. In terms of an order of the Court, issued in the suit of Berkeley v. Romano, the restaurant was offered for sale at auction at the Mart on the 2nd inst. It was withdrawn, however, after a solitary bid of 20,000*l.* had been made.

The Student's Column.

GAS AND GAS FITTINGS.

16.—COOKERS, WATER HEATERS, GEYSERS, AND GREENHOUSE BOILERS.

COOKERS.—Gas-cooking appliances are now universally used in all towns provided with a public gas supply, and vary in size from the small griller used in workmen's tenements in conjunction with the penny-in-the-slot meter to the imposing "cookers," over 6 ft. in height and in width, used in many hospitals, hotels, and business premises where meals have to be provided for several hundred persons. For a long period an unreasonable prejudice existed amongst the general public against the use of gas for cooking, but this has gradually been overcome, and gas is now recognised as a more perfect cooking agent than coal. The fact that gas-cooking appliances have been introduced into a great number of hospitals and asylums has satisfied the general consumer that the use of gas for cooking will not result in untimely decease, and the number of cooking-stoves lent out on hire by gas companies has increased rapidly during the past few years, the total number of cookers in use in the United Kingdom being now over 800,000.

A glance through the catalogues issued by the principal firms of gas stove manufacturers will show that cookers are now made to meet almost every conceivable requirement, but a detailed description of these cannot be given in these columns. The ovens should be provided with a jacket or case filled with slag wool or other suitable non-conducting material in order to economise the heat as much as possible, and the interior of the oven should be enamelled to render cleaning less troublesome.

The Odour emitted from Gas Stoves.—When a gas flame comes in contact with, or in very close proximity to, a cold surface the flame becomes cooled, and emits a disagreeable odour owing to the fact that incomplete combustion of the gas then occurs. With many stoves and fires this odour is perceptible for the first few moments after lighting, but is no longer emitted when the stove becomes hot. A similar odour is emitted when the flame flashes back and burns within the mixing tube, owing to incomplete combustion caused by the cooling action of the metal tube and the limited volume of air admitted to the flame. When a cold sheet of metal, such as the bottom of a kettle filled with cold water, is lowered into a flame the odour is at once perceptible, and continues to be emitted until the metal becomes sufficiently hot to allow the flame to rise again to the temperature necessary for complete combustion.

A frequent cause of unpleasant odours from cookers is the accumulation of dirt or grease upon them. Unless a cooker is kept scrupulously clean, it is certain to emit a disagreeable odour immediately the fatty matter becomes strongly heated, and in many cases the odour is distributed over the building by the down-draught from a defective flue. Gasfitters frequently assure their employers that a flue for a cooker is quite unnecessary, but it is a foolish practice to use any appliance consuming a large volume of gas without providing means for the removal of the combustion products.

Position of Flue.—The flue should, where possible, be carried from the stove into an existing chimney having a good natural up-draught. If the flue be carried through a side wall of a room which also contains a chimney, the up-draught of the chimney is apt to produce a "pull" on the wall orifice and draw air down the stove flue instead of allowing the combustion products to escape. A flue of this description is worse than useless. With an efficient flue and a clean cooking-range, with flames not too close to cold surfaces, a gas cooker is as free from smell as a coal fire.

Water Heaters and Geysers.—When coal-gas is consumed under the best conditions carbon dioxide is formed, and as this gas is not a supporter of animal life, it should be conducted from the room by an efficient flue. When a gas flame is cooled by contact with a cold surface an intensely poisonous gas, termed carbon monoxide, is formed, owing to the fact that the flame temperature is not sufficiently high to cause the complete oxidation of the carbon in the decomposing hydrocarbons of the coal-gas. Carbon dioxide, the product of complete combustion, will not support animal

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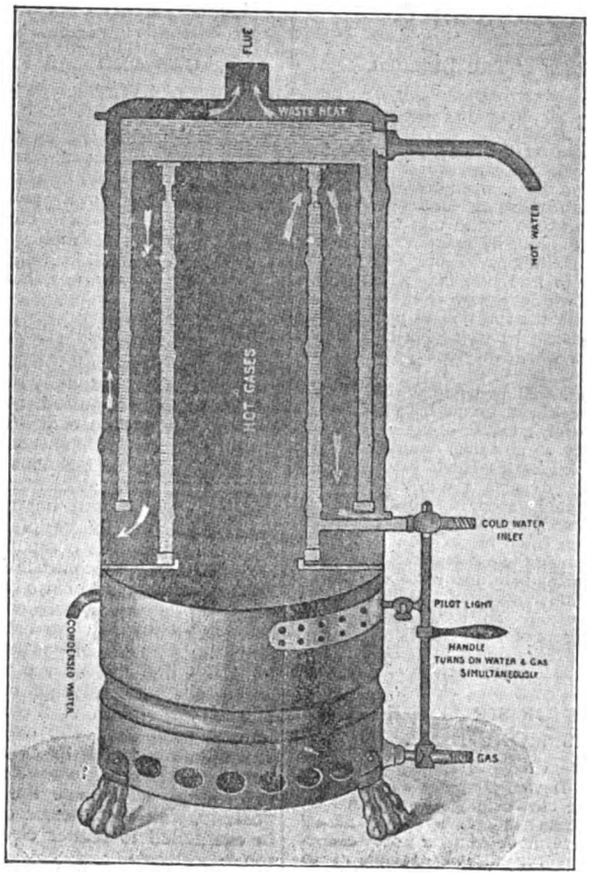

Fig. 41.—A Rapid Water Heater.

life, but it does not possess the poisoning activity exerted by carbon monoxide. Carbon monoxide has no odour, but when incomplete combustion of the gas occurs other products are simultaneously formed which emit a very penetrating odour and give warning that the poisonous carbon monoxide is being generated. The "smoke" from a coal fire contains both carbon monoxide and carbon dioxide, together with a number of objectionable compounds which are not present in the products of combustion from the purified coal-gas supplied in our towns, but if the visible "smuts" were not present in coal smoke, there is little doubt that a grate would soon be placed on the market with the assurance that coal might be consumed in it with perfect safety in a room not provided with a chimney. Some water heaters are used in bathrooms without any flue, and do not evolve any perceptible odour; while others always produce a disagreeable smell, and have upon several occasions been the cause of death to persons exposed to their influence. In the former cases complete combustion of the gas is effected, while in the latter the combustion is not complete. The fact that bath water heaters are often used in small rooms without exerting any *apparent* prejudicial influence does not necessarily prove that the combustion products are harmless even when complete combustion occurs, and as it is known that carbon dioxide is not a supporter of animal life, it is a wise precaution to always provide means for its withdrawal in such small rooms as bathrooms of average size.

When an indication of the occurrence of incomplete combustion is obtained by the generation of the characteristic odour emitted by the compounds formed under such condition, it is mere folly to continue the use of the water heater without a flue.

Bath Heaters.—A good gas water heater or "geyser" is the cheapest and most convenient agent for heating water for baths. Where possible, the water heater should be fitted outside the bathroom, and the principal manufacturers of water heaters supply appliances which can be fitted in any part of the building, and be arranged to distribute hot water to any or every room in the house. It should be remembered, however, that the greater the length of pipe through which the hot water has to travel the greater is the proportion of heat lost.

Water heaters may be used in small rooms with perfect safety if connected to a flue, and if the precaution be taken to ascertain that a strong up-draught exists in the flue even when the gas is not burning.

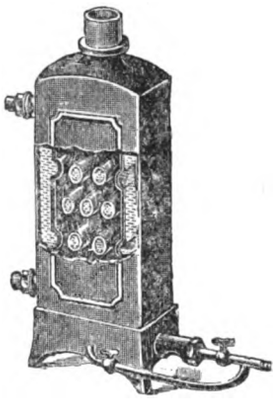

Fig. 42.—Greenhouse Boiler.

An appliance known as a "geyser" is usually employed for heating bath water. The water is rapidly heated by causing it to travel over a large surface of heated metal, the heat of the waste products of combustion being utilised as completely as is practicable. The apparatus is, as a rule, constructed of copper, and should be kept as clean as possible. So many excellent water heaters are now made by a number of competing firms that it would be impossible to describe them all, and an illustration of one must serve to indicate the general principles upon which water heaters are constructed; but the fact that they are so largely in demand is sufficient evidence as to their utility. Some water heaters are manufactured in which the products of gas combustion come in contact with the water, and contaminate it to a certain extent with soluble impurities. The efficiency of such heaters is very high, but water so heated is not to be recommended for drinking, cooking, or bathing, although it may be used for many other purposes.

Richmond's "Gulf Stream" water heater (fig. 41) is a good example of a rapid water-heating appliance.

The water and gas are turned on simultaneously by manipulating a handle, so that no trouble can arise through forgetting to turn on the water after lighting the gas. A pilot light is also provided which prevents any explosion taking place when the main gas burners are lighted. These water heaters are not intended to actually boil the water, but merely to rapidly raise it to a scalding hot temperature. The rate of gas consumption is necessarily high, but as a large volume of water is heated in a few minutes, it is not usually necessary to keep the gas burning for a long period. With the "Gulf Stream" water heater the consumption is 70 cubic feet per hour, but hot water will be delivered from it in two minutes after the time of lighting and will continue to be delivered as long as the gas is kept burning. The rate of water flow and the rate of gas consumption are simultaneously regulated by manipulating the handle.

Boilers.—For heating water to a boiling condition with the aid of gas, boilers are made in all sizes in copper or galvanised iron. They are sometimes fitted with cross tubes around which the flames and hot products of combustion pass. They form, in fact, a description of multitubular boiler, and although when first lighted they may evolve the disagreeable odour due to incomplete combustion, the odour ceases to be emitted as the temperature of the tubes increases. With a good boiler 10 gallons of cold water may be boiled in half an hour with a consumption of 25 cubic feet of gas.

In some cases baths are heated by gas burners placed beneath them, the water being made hot while the bath is being filled. This arrangement is apt to damage the bath and is much inferior to a good geyser.

Greenhouse Boilers.—Gas is not an economical agent for heating large greenhouses, but it is exceedingly useful for maintaining a uniform temperature of any required degree, and for small greenhouses its cost is not as a rule prohibitive. The products of combustion must not be allowed to accumulate in the greenhouse, as they exert a prejudicial influence upon plant life. The sulphur compounds, which appear to be the most injurious, may, however, be eliminated to a considerable extent by the use of condensing stoves, and these are often used in greenhouses without a flue.

In order to heat a greenhouse uniformly it is necessary to use hot water or steam circulating pipes. A cast-iron apparatus suitable for heating water pipes known as Arden Hill's "Acme" Greenhouse Boiler, is shown partly in section in fig. 42. It is equally adapted for the heating of conservatories, workshops, or halls. The cross tubes are heated by the ascending current of hot combustion products, and a higher heating efficiency is obtained than when an ordinary boiler is employed.

In every description of gas-heating apparatus the burners and the heated metal must be kept scrupulously clean, and the flames should not be allowed to come in contact with a cold surface.

THE NEW ST. PANCRAS BATHS.

These baths, which comprise four swimming-baths and 129 slipper-baths, together with a public wash-house with fifty washing compartments, were opened last week. There are two entrances in Prince of Wales'-road for first and second class men bathers respectively, with a pay-box between them. These entrances lead directly and without corridors to the two men's swimming-baths and to the slipper-baths. In the Grafton-road are two entrances, one for women bathers and one for the public wash-house.

The men's first-class swimming-bath is 115 ft. 6 in. long and 50 ft. wide, the bath pond being 100 ft. by 35 ft. The hall is lined with glazed bricks, the sides of the swimming pond with Balaam's patent white glazed bricks, specially designed for baths, and the floor with terrazzo. The gangways are 4 ft. wide at the sides and 6 ft. wide at the ends, and are paved with terrazzo, the nosing to the bath pond being in marble. There are eighty dressing-boxes, all made to remove during the winter. The depth of water in the pond ranges from 3 ft. 6 in. to 7 ft. At the deep end of the bath is a large diving-stage. An overhead shower is provided by means of sprays from the ceiling. The ceiling of the bath has been designed upon a completely new principle. Hitherto all bath ceilings have had a ventilating skylight in the centre, which causes a considerable echo of the water splashing in the bath. In this instance there is a curved ceiling of trefoil section with curved glazed inner sashes on each side and external skylights over. It is expected from this arrangement that the splashing echo will be avoided. But beyond this, and of equal importance, the curved ceiling, without a lantern skylight, will give much better acoustic qualities to the hall, especially for

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concerts, &c., during the winter. The bath is warmed and ventilated upon the "plenum" system. Cold fresh air is taken in at a main inlet in Grafton-road, and is driven by a fan through a steam heater, and thus warmed enters the hall at the floor level, and passes out through a large outlet in the ceiling. In addition to this, and with a view to preventing that condensation which is so common an evil in all swimming-baths, there is a supplementary plenum apparatus, which delivers warmed fresh air at the ceiling level. In the men's second-class swimming-bath the bath pond is the same size as in the first-class bath. The internal finishings are, of course, not equal, but otherwise all the accommodation is practically the same. The ladies' first-class swimming-bath is 97 ft. by 40 ft., with a swimming-pond 75 ft. by 25 ft. All the internal finishings to this bath are similar to the men's first-class swimming-bath, and in some cases rather better. An effort has been made to make this bath very bright and cheerful. There are forty dressing-boxes tastefully fitted up with curtains and looking-glasses, and also two douches, and a neatly furnished dressing-room, with lavatory, settee, and toilet-table and looking-glass. The ladies' second-class swimming-bath has a swimming pond 50 ft. by 20 ft. The arrangements are similar to those in the first-class bath, with somewhat less finish.

There are 129 slipper baths, twenty-nine men's first-class, sixty-five men's second-class, ten ladies' first-class, and twenty-five ladies' second class. The accommodation in all these slipper baths is of the same character, except that for the first-class baths the partitions and doors are of enamelled slate, and for the second class painted slate. The baths are of glazed fireclay with teak rolls. (Teak rolls have been adopted in place of glazed rolls as being safer.) Each bathroom has a seat, a good sound looking-glass, with shelf, and two hat pegs, together with footboard and cork mat. The bath valves are of the manufacture of Messrs. G. Jennings & Co., and work from both inside and outside of bath, and are so designed that hot water cannot be turned on until the cold water has been set going, thus preventing scalding and damage to the baths. Six of these baths are provided with hot and cold showers. Good waiting-rooms are attached to all slipper baths.

Public Wash-house.—The public wash-house is entered from Grafton-road, and comprises fifty washing compartments, fifty drying horses (heated and ventilated on the "plenum" system), and a mangling and ironing room. The hydro-extractors in the public wash-house are driven by hydraulic power direct, without belting, and are fitted with automatic covers, so arranged that the cover is closed while the hydro is at work, and is only open when it is at rest. This will prevent accidents. The ironing-room has two mangles, folding-tables, and ironing-tables. Electric irons will be used. In connexion with the public wash-house is a crèche, also a large waiting-room and cloakroom.

Administrative Departments.—There is large boiler house, with three Galloway boilers 30 ft. by 7 ft., and an economiser. These boilers will provide steam for warming the water in the swimming-baths, and in connection with the heating apparatus and hot-water supplies generally. The superintendent of the baths has an office close to the men's entrance, and a residence on the second floor. There is a large committee-room on the first floor, which will also be used as a lady artistes' room during the winter. The establishment laundry is in the basement, and will be worked by men only. There is one Baker's washing-machine, two hydro-extractors, seventeen drying-horses, boiler, and rinser and vertical mangle. A large towel store is provided near this laundry. There is a complete system of subways in the basement for the purpose of administration, and these are in connexion with the superintendent's office and residence and boiler-house, establishment laundry, and towel store. All trolley work in connexion with towels, bathing-drawers, &c, will be done in the basement. The clean towels will be brought by lifts direct into the pay offices, and all dirty towels, &c., will be sent through glazed brick-lined shoots down into the basement. It is expected that a considerable saving in the cost of administration will be the result of this arrangement. Two refreshment-rooms are provided, one for men and one for women, near their respective entrances. The warming and ventilation of the men's first-class swimming-bath have already been described. All other departments are warmed by means of low pressure hot-water apparatus, and ventilated by means of Davidson's "Sirocco" fans electrically driven.

The elevations are all faced with Lawrence's red brick with terra cotta bands, corners and dressings. The whole of the buildings are of fire-proof construction throughout, there not being a timber floor joist in the whole building. The walls of the main departments, including all swimming baths and slipper baths, are lined with white glazed bricks with salt glazed brick dadoes. All pavings except to basement are laid in terrazzo. All wood floors are in herring-bone solid wood blocks. The whole of the internal wood, iron and slate work has been painted with "Ripolin" enamel paint. The buildings throughout are lighted by electricity. Also, with the exception of the hydraulic work, all motive power is supplied from electric motors. Two artesian wells are being sunk on the premises, which it is hoped will yield between them about 25,000 gallons of water per hour.

The cost of the buildings, together with all machinery and fittings, has been about 75,000*l.* The strictest economy has been exercised in the construction and finish of these buildings, and no attempt has been made at elaborate architectural display internally or externally.

The building contractor is Mr. C. Wall, of Chelsea. The chief engineering works have been carried out by Messrs. Z. D. Berry and Sons. The hydraulic work and plenum ventilation has been executed by Messrs. W. J. Fraser & Co. The electric lighting has been carried out by Messrs. Edmundsons. Messrs. Doulton & Co. executed the terra-cotta work, Messrs. W. B. Simpson & Sons the faïence work, and Messrs. Diespeker & Co. the terrazzo work. All skylights are laid with Rendle's patent glazing. The glazed fire-clay baths were supplied by the Farnley Iron Company. The internal sanitary fittings have been supplied by Messrs. Tylor & Sons. The wood block flooring was supplied by the Westminster Flooring Company. The gearing for opening the fanlights is supplied by Messrs. Jones, Lock, & Co. The whole of the slating and slate masons' work, including enamelled slate partitions, are by Messrs. Shenton, of Kentish Town.

The architect is Mr. T. W. Aldwinckle, who had the assistance of Messrs. Dolby & Williamson as consulting engineers in connexion with the electric lighting. Mr. E. T. Larkin has acted as clerk of works throughout. The design and plans were illustrated in the *Builder* for September 23, 1899.

THE PLUMBERS' COMPANY AND APPRENTICESHIP.

THE Committee of Representatives of District Councils for the following places:—Belfast, Birmingham, Bradford, Cardiff, Dublin, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Nottingham, Plymouth, and Sheffield, acting in conjunction with the Plumbers' Company, deem it highly desirable a prescribed apprenticeship or course of training should be recognised in connexion with the National Registration of Plumbers.

A special form of indenture has been prepared for the purpose by a conjoint board composed of representatives of the London Society of Associated Master Plumbers, the United Operative Plumbers' Association of Great Britain and Ireland, and the Plumbers' Company. The indenture is based on the form of indenture authorised by the Corporation of the City of London, and approved by the Court of Chancery. It includes definitions of the character and scope of the work of the registered plumber and of the term "sanitary plumbing," as approved by the Parliamentary Committee on Trade, in order that the sanitary bearing of the work of the registered plumber may be generally recognised by plumbers, as well as by architects, health authorities, and others, as constituting the reason for the registration system and the ground of the application for statutory powers to be conferred on the registered body.

These definitions are in the following terms:—"The trade of a plumber and the art of sanitary plumbing, including all branches of the said trade or of the said art which require technical knowledge of water fittings and other sanitary appliances, and skill to construct and adjust the same in such a manner as to prevent the contamination of air or water in dwelling-houses or other buildings by emanations from drains or sewers."

Covenants are included expressly providing for:—1. The attendance of the apprentice at approved classes of technical instruction. 2. The apprentice presenting himself for annual examinations in technical knowledge and workmanship in conformity with such rules and regulations as may from time to time be prescribed in connexion with the National Registration of Plumbers. 3. The cancelling of the indenture after due notice to the parties, in the event of the apprentice failing to pass a satisfactory examination in the third year of his apprenticeship, provided such cancelment be recommended by the examining body.

It is recommended that this form of indenture (subject to such modification as may be necessary to meet special cases) should be generally adopted with a view to a uniform qualification being established for the purpose of the National Registration of Plumbers. It is also recommended that a Register of Apprentices should be kept in each district.

A corresponding form of indenture is prepared adapted to the requirements of Scotch law.

WATER SUPPLY, BRIDGWATER.—Colonel A. J. Hepper, on behalf of the Local Government Board, recently sat in the Council Chamber to hear an application by the Bridgwater Rural District Council for sanction to borrow sums amounting to 24,000*l.* for the purpose of a water supply for the parishes of Bawdrip, Chedzoy, Huntspill, North Petherton, Pawlett, and Puriton, including the construction of works in the parishes of Bridgwater Without, Broomfield, Chilton Trinity, and Goathurst. The principal evidence was that of medical officers of health, who stated that the water in each parish was very impure

OBITUARY.

MR. T. HARPER-WALLIS.—We have to record the death, at Littlehampton, of Mr. Thomas Harper-Wallis, of Market Rasen, an octogenarian Lincolnshire builder, who leaves the unique record of having built and restored more than thirty churches and parsonages in his native county alone from designs of the late Messrs. Ewan Christian, G. E. Street, Jas. Fowler (Louth), and others.

GENERAL BUILDING NEWS.

CHURCH HALL, BARRY, N.B.—A hall erected in connexion with the parish church of Barry has recently been completed. The building, erected from plans prepared by Mr. Jas. P. Bruce, architect, of Carnoustie, stands on the site of the parochial school, at the south end of Barry Brae, and is entered by a large open porch. The style of architecture adopted is a free treatment of Gothic. The hall has accommodation for 200 people, besides a large platform and anteroom, with lavatory accommodation in connexion. The building is heated by hot-water pipes on the low-pressure system, and ventilated by the "Boyle" system. Internally the walls are lined with pitch-pine lining 6 ft. high, having hinged divisions, whereby the hall can be divided into separate compartments for the use of Sunday school classes. The contractors were:—Mason, Geo. Robertson; joiner, Geo. Fox; plumber, John M'Andrew; slater, Alexander Hogg; lather, James Fyffe; plasterers, M'Ritchie & Co.; smith work, R. Crighton; ventilation, Robert Boyle & Son, Limited; heating, Wm. Nicoll; glaziers, Donald & Smith; painters, P. & A. Davie.

NEW BUILDINGS IN THE STRAND.—Messrs. Ernest Runtz & Co. are the architects of the temporary premises that have been erected for "Short's" upon the site of the Coach and Horses Tavern, Nos. 323-4, Strand. The tavern, rebuilt in 1888-9, after Mr. W. T. Farthing's designs, had been pulled down for the improvements now being carried out on the area between Newcastle and Catherine streets. The new temporary premises have an uncommon elevation, being built after the half-timbered style, and we gather that a large amount of timber taken from the demolished houses was utilised in their construction. The Gaiety Theatre Company have taken from the London County Council a lease for fifty years of the site for their new theatre, to be designed also by Messrs. Ernest Runtz & Co., and into which they hope to remove within eighteen months hence. The Company have undertaken to expend 50,000*l.* upon the building, but anticipate that the cost will amount to about 15,000*l.* more. The Company have received 25,000*l.* in compensation for dispossession from the County Council, who, it appears, will also provide the 50,000*l.* for the new house.

BUILDING IN FLEET-STREET.—We gather that Messrs. Gibbs & Flockton prepared the plans and designs for the new London offices of the *Sheffield Telegraph*, for which a site has been cleared at the corner of Fleet-street and Fetter-lane.

DRILL HALL, BILSTON.—The new drill hall of the G (Bilston) Company of the 3rd Volunteer Battalion South Staffordshire Regiment has been erected in Mount Pleasant, Bilston, on a site presented by Sir Alfred Hickman, M.P. The accommodation provided comprises an office, sergeants' room, residence for sergeant-instructor, armoury, drill hall, and kitchen, lavatories for officers and men, &c. The exterior of the building is faced with red bricks with Hollington stone dressings, and the roofs are covered with red tiles. The drill hall is 75 ft. long and 40 ft. wide, lighted from the top. It has a dado of salt-glazed bricks, and the floor is formed of wood blocks. The building is heated by hot water, and wired for electric light, which will be installed as soon as the supply is available. In the meantime provision has been made for lighting by gas. The builder is Mr. Thomas Tildesley, of Willenhall, who has carried out the work in a satisfactory manner. The architect is Mr. Henry T. Hare, Hart-street, Bloomsbury-square, London.

PUBLIC SLAUGHTERHOUSES, BARROW.—New slaughterhouses have been erected by the Barrow County Council at the north-east end of Cavendish-street and adjoining the electric light station and the refuse destructor, at an estimated cost of 18,000*l.* The building is erected to the designs drawn by Mr. W. H. Fox, the Borough Engineer, but only about two-thirds of the scheme is being carried out at present.

LIBRARY BUILDINGS, ROATH, CARDIFF.—A new branch library was opened at Roath on Thursday, the 10th inst. It provides for storage accommodation for 11,000 volumes, capable of expansion to 17,000 volumes. The cost of the building was 2,480*l.* Messrs. Teather & Wilson, Queen-street, Cardiff, are the architects.

NEW POLICE BUILDINGS, WARRINGTON.—The new police buildings erected for the Borough of Warrington, from designs by Mr. R. Burns Dick, of Newcastle-on-Tyne, were opened on the 11th inst. The architect has given the cells the position of first importance. The chief constable's office is near the magistrates' entrance, which will also be used by the Watch Committee, and the detectives' department is at the south-east corner, near to the public entrance, and midway between the chief constable's

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and chief inspector's offices. The hall or public lobby of the coroner's court is directly on the left, and that of the police court on the right. The entrance to the public galleries is distinct from those leading to the body of the court. The buildings will be warmed with low-pressure steam on the double-pipe gravity-return system, and in corridors, window recesses, or larger rooms, ventilating radiators have been provided. The cost is estimated at 25,000*l.*

NEW CHURCH, WILLESDEN.—The Bishop of London on the 12th inst. consecrated the first completed portion of the permanent church of St. Matthew, Willesden. In order to relieve the adjoining parishes of St. Mary's, Willesden, and All Souls', Harlesden, the St. Matthew's district was set apart in 1894, and in the following year the mission church—a temporary building—was opened. The part of the church now opened for public worship consists of the chancel, morning chapel, transepts, and two bays of the nave, providing accommodation for 500 people. When the building is completed there will be a seating capacity for 800 persons. The church is being erected from the designs of Mr. W. D. Caroë, architect to the Ecclesiastical Commissioners.

CLUB BUILDINGS, CRIEFF, N.B.—A building is about to be erected for the Crieff Unionists Club, in King-street, in that town. The front is of simple and neat design, and will be of freestone. The plan of the ground floor shows a small hall, billiard-room, lavatories, and two shops facing King-street; while on the upper floor are situated committee-room, ladies' room, news room, and accommodation for the caretaker. Mr. George T. Ewing, Pitkellony, Muthill, is the architect.

PATHOLOGICAL AND MORPHOLOGICAL LABORATORIES, OXFORD.—The new Pathological Laboratory at Oxford University Museum, which has been erected at a cost of 10,000*l.*, was opened on Saturday in the presence of a large and representative gathering of members of the University and the medical profession. The Vice Chancellor (the Provost of Oriel) presided. An address was delivered by Sir William Church, who alluded to the great progress which had been made in the development of natural science at Oxford, and said it appeared to him that day had been most happily chosen for the opening of the pathological department, for to-day was being celebrated the eightieth birthday of the Nestor of pathological research, Professor Virchow, and Oxford could not in a more worthy way pay its homage to the veteran scientist. The site for the department is within the grounds of the University Museum. The building occupies a space of 65 ft. by 75 ft., and to the north has a yard 60 ft. by 30 ft. The front elevation, in which is the main entrance, is toward the east, and nearly all the rooms are lighted either from this aspect or the north. The building consists of a partially-sunk basement and two floors. Entering by the main door access is given to a central hall, from which or from its gallery all the rooms of the department open. Running up through both floors is a lecture-room (25 ft. square and 22 ft. high) and a museum (31 ft. by 25 ft.) and of a similar height, both being lit from north and east by roof lights. Besides these, on the ground floor is a research-room for experimental pathology (25 ft. by 18 ft.), and another of similar size fitted up as a chemical research laboratory. To the former is attached an incubation room, and to the latter a small balance-room. On this floor there is also a private room for the head of the department, a private research laboratory, lavatory accommodation, &c. On the first floor there is a large room (43 ft. by 18 ft.) for the teaching of pathological histology, and to this is attached a preparation room. There is also a class-room (31 ft. by 18 ft.) for practical bacteriology, a photographic room, and a demonstration room, &c. In the basement of the department is a private laboratory, a dark laboratory, a large preparation room for the pathological and bacteriological work of the department, storeroom, room for heating apparatus, and workshop. The basement will also contain a refrigerating room (10 ft. square and 8 ft. high) kept below zero by one of Hall & Co.'s carbon dioxide freezing apparatus. The building was carried out under the immediate supervision of the architect, Mr. J. Augustus Souttar, of London. The morphological laboratory attached to the University Museum was commenced in July, 1898. The funds for its construction having been voted by Convocation in the previous year, Mr. J. J. Stevenson, F.S.A., was appointed architect, and with his partner, Mr. Harry Redfern, has designed the building, which has now been completed. Messrs. Symm & Co. were the builders. It contains on the top floor a laboratory with desks for 100 students, and the requisite convenience for carrying on the work, rooms for professors and for private investigation, storerooms for diagrams, &c., cloak room and lavatories for male and female students, and a well-lighted lecture theatre, accommodating 100 students, the entrance so arranged that it could be used by other lecturers without interfering with the work of the laboratory. As the main front occupies a conspicuous position facing the parks, it is of stone like the other buildings of the Museum. The side towards the court is of brick, with doors and windows of stone. The character of the architecture has been determined by the purposes of the building, which necessitated large windows of plate glass, giving uninterrupted light for microscopical work. The floors are of concrete, boarded over, as also the flat roof, with a covering of asphalt.

WORKHOUSE EXTENSION, GRIMSBY.—The extensions of the Grimsby workhouse and infirmary were formally opened on the 10th inst. by the chairman of the Board of Guardians. The new buildings consist mainly of an extension of the infirmary, but the aged women's block, the laundry, the male and female pavilions, the wards for general sick and isolated cases, have also received additions. The infirmary has now accommodation for 142 beds. The builders, Messrs. Hewins & Goodhand, of Grimsby, have carried out the work at a cost of about 8,000*l.* from designs prepared by Mr. Herbert C. Scaping, of Grimsby, who was the architect of the original buildings.

RESTORATION OF ST. ANDREW'S CHURCH, TROWSE, NORWICH.—This church was reopened, after extensive restoration, on the 11th inst. A new aisle has been built, the nave has been reroofed, the whole church has been refloored; and heating apparatus, light, choir stalls, holy table, communion rails, and a large two-manual organ have been provided. The work remaining to be done includes reroofing the chancel, repairing the south and west walls, the porch, the tower, the chancel walls, and the east end window. The cost of the work is estimated at 3,000*l.* The contractor was Mr. J. S. Smith, of Norwich, and Mr. E. T Boardman, of the same city, was the architect.

METHODIST CHAPEL, BULWELL, NOTTS.—On the 12th inst. memorial stones were laid of a new chapel and schoolroom at Highbury-vale, Bulwell. The edifice, which will be plain Gothic in style, will be built of brick and stone, with a large stone Gothic window in the front and square head windows inserted in the sides. The building will be 52 ft. 6 in. long and 27 ft. 6 in. wide, and provision has been made for the construction of a kitchen, 12 ft. square, on the left hand side at the back. This will be utilised as a classroom, and underneath will be a heating-chamber. The school will be divided from the chapel by a partition, but ultimately it is intended to erect a church on an adjoining site, which has been reserved for the purpose, and then the premises which are now being built will be devoted to Sunday-school work. Accommodation will be provided for about 320 persons. The cost is estimated at 1,000*l.* The builders are Messrs. Herbert Ingham & William Pipkins, of Basford, and the architect is Mr. J. R. Swift, of Arnold, Nottingham.

SANITARY AND ENGINEERING NEWS.

LIGHT RAILWAY, ORMISTON, N.B.—A light railway connecting Gifford with the Ormiston branch of the North British Railway to Edinburgh has recently been opened. The line is nearly ten miles long and cost 100,000*l.* Messrs. Joseph Phillips & Sons, of Westminster, were the contractors.

WATER SUPPLY, KINTORE, N.B.—The members of the Kintore Town Council recently visited the sources of the proposed new water supply for the burgh. Measurements were made of the volume of water capable of being supplied from the source. Although it was found that it had decreased more than one-half of what it was when measured five months ago, still it was considered that the two springs—Smuggler's Well and Buckland Well—were together sufficient, even in a dry season like the present, to meet a much larger consumption than the population for some time would demand. The engineer made a rough calculation that a sum of 2,000*l.* would be ample to cover the cost of the undertaking, and the engineer, Mr. Bremner, of Kintore, was instructed to lay before an early meeting of the Council statistics giving particulars of the work proposed, and showing approximately the cost of the scheme.

MORECAMBE SEWERAGE.—Some eighteen months ago the Morecambe Urban District Council decided to carry out a complete sewerage system for their district, and the contract for the greater portion of the work was entrusted to a firm who went into liquidation in March of the present year. The Council have now decided to take the work in hand and complete it themselves. The scheme will probably cost about 100,000*l.*

NEW WATERWORKS, EXETER.—During a recent visit of the members of the Exeter and District Chamber of Commerce the City Surveyor of Exeter, Mr. D. Cameron, gave an account of the waterworks of the town, both old and new. The new work is being carried out under his superintendence. The old works consisted of a brick culvert, 1½ miles in length and 2 ft. in diameter, laid from the intake at Stoke Canon to Pynes Pumping Station, the pumping machinery consisting of water-wheel, three turbines, steam beam engine with two Cornish boilers, whence the water was pumped by means of 12-in. and 10-in. mains to two reservoirs at Dane's Castle, having a head of 156 ft. above the pumping station. The water at Dane's Castle was filtered by two beds, and then forced by means of two boilers and a Worthington engine through a 7-in. rising main to a reservoir at Mary Pole Head, at a height above the filter-beds of 270 ft. The reservoirs at Dane's Castle supply the low level consumers, which amount to fully two-thirds of the population, the remainder, forming the high level portion, being supplied from Mary Pole Head. In 1897 and 1898, the Water Committee of the Exeter City Council had under their consideration the question of a better supply and more storage capacity of water available for all purposes, and in April, 1898, application was made to the Local Government Board for leave to borrow 36,000*l.* for new works. The necessary consent was given, and the works started in August, 1899. The new works at Pynes consist of a new conduit, 1¾ miles in length by 2 ft. 6 in. in diameter, of turned and bored cast-iron pipes, from the intake near Stoke Canon into the settling reservoirs at Pynes. The two settling reservoirs are each 224 ft. by 164 ft., with 11 ft. 3 in. depth of water, and have a capacity of 2,000,000 gallons each. There are six filters, each 210 ft. by 57 ft., and 6 ft. 6 in. deep, with 3 ft. of filtering material (Fremington sand), and a filtering area of 72,000 superficial feet each, capable altogether of filtering 3 million gallons per day. The water from the settling reservoirs gravitates to the filters through an 18-in. cast-iron supply main, whence, after being filtered, it flows to the pump suction wells through 18-in. cast-iron supply mains, from which it will be pumped by means of turbines and steam engines to the distributing reservoirs at Dane's Castle and Mary Pole Head. The new pumping plant will consist of a new Worthington pumping-engine capable of lifting 2½ million gallons per day, the Cornish boiler and three new vortex turbines, and the whole of the pumping capacity will amount to over 3 million gallons per day. The turbine house has been enlarged and a new engine house erected for the Worthington engine. The banks of the leat from Pynes to leat intake will be raised 2 ft., and the sides made with concrete blocks, so as to give a better head for the new hydraulic machinery. A new intermediate reservoir has been constructed at Pennsylvania 83 ft. by 54 ft., and 19 ft. deep, with a capacity of 500,000 gallons. After the water leaves the filter beds it gravitates through an 18-in. main to the pump suction well, from which it is pumped through a new 14-in. rising main 1·54 miles long to the new intermediate reservoir at Pennsylvania, and the existing reservoir at Mary Pole Head, which supply the whole of the high level parts of the district, or through the old 12-in. rising main just over two miles in length, to the old filter beds, now to be used as reservoirs, and the old reservoirs at Dane's Castle, where it supplies the low level portion of the district. The whole of the pumping plant will be taken away from Dane's Castle, and it suitable used at Pynes. The existing storage capacity is about 5,384,000 gallons, which will be increased by the new works to 10,000,000 gallons. At present the unfiltered water is conveyed from the intake at Stoke Canon to Pynes pumping-station, and there pumped through to 10-in. and 12-in. rising mains to Dane's Castle, receiving reservoirs, passing from reservoirs to filter beds, and from filters into the clear water well, from which it is again pumped up to the reservoir at Mary Pole Head. Under the present system, through having the pumping stations, filter beds, and reservoir at different places, it means the keeping up and working of two sets of pumping plant, entailing double cost, which under the new works is remedied. The new works have the intake, settling reservoirs, filters, and pumping plant all at one station, which means the provision of only one lot of plant—with the necessary saving in labour, coal, &c.—which pumps the water into the storage reservoirs to supply the city.—*Western Morning News.*

FOREIGN.

FRANCE.—The "Vieux Paris" Committee has passed a resolution that the public should be admitted to view the interior of the Ecole Militaire, one of Gabriel's finest buildings. The notable portions of the interior are especially the grand staircase, the chapel, the salle d'honneur, and the library. ——A large mosaic panel has been fixed on the wall of the orangery at the Luxembourg, executed some years ago by M. Guilbert Martin, from the cartoons of M. Edouard Fournier.——The ceiling painting by M. Bonnat, representing "Justice," which was exhibited in this year's Salon, has now been fixed in the place for which it was intended, in the first chamber of the Cour d'Appel.—— The Budget Committee in Parliament has voted 300,000 francs for the use of the Department of Monuments Historiques. —— One of the decorative landscapes in the Hôtel de Ville, M. Berthelon's view on the Seine, has been destroyed by some person unknown.——M. Roty has executed a medal in commemoration of the success obtained by M. Bénard, two years ago, in the California University competition. —— The monument to Pasteur, of which the model had been left by Falguière, has now been completed in marble, under the direction of M. Dubois. It will probably be erected on the Place du Panthéon, or in the Square of the Sorbonne, on a pedestal designed by M. Girault.——M. Carré, architect to the Department of the Foreign Office, has been

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commissioned to rebuild on new lines the palace of the French Legation at Pekin, which was destroyed during the siege of the city. ——The jury in the competition opened for the erection, in the mountains of Puy de Dôme, of a "Hôtel des Voyageurs," has awarded the first premium to M. Pierre Valade; the second to M. Gozier; the third to M. Gaston Rapin; the fourth to M. Bruno Pellissier: all of Paris.——The Municipal Council of Calais has decided on the erection of a new Town Hall.——M. Injalbert, the sculptor, has just completed, for the town of Cette, the model of a fountain which it is proposed to erect on the site of former fish-market. The fountain, six mètres in height, will be surmounted by a statue of a faun, above a group of sailors and fisher-women.——We have to announce the death, at the age of forty-eight, of M. Paul Gaston Aubry, a member of the Société Centrale des Architectes. He was a former pupil of André, and became architect to the diocese of Aire d'Autun. He was the architect for numerous private houses, as well as for the restoration of the châteaux of Villegougis and Sully.

INDIA.—Extensive alterations and improvements in the exits and waiting halls at the Lahore railway station have been sanctioned.—— The military department is constructing a transport siding and platform at Umballa in connexion with the animal detraining depôt at that station.——The Madras harbour trustees have decided unanimously in favour of the northern entrance to the harbour being protected by a short groyne, and the sanction of the Secretary of State has been applied for to enable the works to be carried out.——The Barsi Light Railway Company are about to extend their line from Barsi road to Pandharpur: the Secretary of State has issued instructions for the preparation of the necessary contract.——In reference to the electric lighting of Simla, we learn that water power sufficient to provide some 450 horse-power is available within some ten miles of the station, and there is a demand on it both for driving the municipal pumps and for lighting purposes. The scheme is estimated to cost about ten lakhs of rupees.——The heavy rains in the Simla district during August have resulted in disastrous landslips. As much as nine inches fell during twenty-four hours, which is the heaviest fall since August, 1891. The road from Kalka was blocked by several slips; passenger traffic was stopped for several days. Fortunately, there was but little loss of life.——Additions and alterations on an extensive scale are being made to Jakhal station-yard in connexion with the entry of the Ludhiana-Jhuri-Jakhal Railway into that station. ——The Government of India have decided to construct a building for the joint accommodation of the United Service Institution of India, libraries of the military department, and Army headquarters at Simla.

UNITED STATES.—Mr. J. R. Thomas, a well-known architect of New York, died recently at a summer resort in the Thousand Islands, at the age of fifty-five. Amongst his important works may be mentioned the New Jersey State Reformatory, at Rahway, two large armories in New York city for the State Militia, besides several churches. In 1896 his design for the proposed New York city hall was placed first by the commission, and on that project being abandoned he received the commission for the new Hall of Records, now in process of construction.

GERMANY.—A statue of Prince Albrecht, brother of the Emperor William I, erected opposite the castle of Charlottenburg, was unveiled on the 14th inst. in the presence of the Emperor William.—— The unveiling of the statue of the Emperor Frederick on the open space between Cronberg and Friedrichshof, which was to have taken place on the 18th inst., has been postponed.——The graves of two celebrated parliamentarians, Lasker and Bamberger, which lie side by side, are about to be covered with a large and richly-ornamented stone, and surrounded by an iron railing. On this stone will be placed a monument of polished Norwegian granite flanked with two lofty pillars, between which will be placed a dedicatory tablet of bronze. The monument has been designed by the State architect, Herr Thierbach.—— The German Emperor has decided that the right and northern semi-circle outside the Brandenburg gate, towards the Siegesallee and the Reichstag building, shall be the site of a monument to his father. The Emperor has also decided to erect a monument to his mother, the late Empress Frederick, on the southern semi-circle. The houses round the Brandenburg gate will be removed, so that the monuments may be clearly visible from Unter den Linden. The work is to be executed under the direction of Herr Hans Everding, a young sculptor who won a small gold medal at the Art Exhibition in 1898.

RUSSIA.—A railway is about to be constructed between the ancient city of Bokhara and the new Russian town of the same name which has sprung up around the station on the Trans-Caspian Railway. The line will be about 20 versts in length, and will be constructed at the expense of the Emir of Bokhara.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. A. H. Ryan-Tenison, architect, has removed his offices from 7, Great College-street, to 12, Little College-street, Westminster.——Mr. Arnold Thornely, architect (Liverpool), has removed his offices from 14, Castle-street, to 51, North John-street, Liverpool.——Mr. F. Brice Hobbs, architect (Liverpool), has removed his office from 14, Castle-street to 51, North John-street, Liverpool.——The business of Messrs. Hodkin & Jones (Sheffield), manufacturers of architectural concrete, masonry, &c., has been registered as a limited company.

CHANGES IN LEICESTER-SQUARE.—The new premises which have just been completed on the site of No. 46, on the west side of the square, together with that of No. 62, Whitcomb-street, in the rear, have been built by Messrs. Prestige & Co., of Pimlico, after the plans and designs of Messrs. E. Wimperis & East, for an old-established firm of billiard-table makers. On the adjoining site, next south, a new house has been built by Mr. T. Stevens. Messrs. C. & E. G. Asprey, of New Bond-street, have entered into possession of the block, Nos. 39-42, on the south side of the square, being the freehold lately vacated by the Dental Hospital of London, covering an area of about 2,080 ft. superficial, which they purchased at auction for 23,000*l.* in July last. The new buildings for the hospital, at the south-eastern corner of the square, recently opened, were built by Messrs. George Trollope & Sons, from designs and plans made by Messrs. Young & Hall.

FIRE AT STEPNEY PARISH CHURCH.— St. Dunstan's, the historic parish church of Stepney, was partially destroyed by fire on Saturday, the 12th inst. The *Standard* remarks that firemen, with at least a score of engines, coming from all parts of the Metropolis, were quickly on the spot, Commander Wells directing their operations. By the time the first engine arrived the fire had got a firm hold of the interior of the vestry, the flames from the roof of it rapidly spreading along the whole length of the double roof of the main building. Examination disclosed the fact that almost the whole of the roof, except that portion which covers one of the aisles, had been completely burned away, only a few charred wooden rafters indicating where it had once rested. Fortunately the ancient square tower, which for upwards of 500 years has stood out as a landmark, was untouched. In the aisle, the roof of which has escaped injury, is a newly-erected altar, and this remains undamaged by the flames. The pews, too, which provide accommodation for some 800 people, have also been preserved, thanks to the energy of the firemen. Of the six stained-glass windows in the church, the one over the altar in the chancel has been slightly damaged, and one other broken to pieces. The altar itself, together with its beautiful draperies, has been completely destroyed by the burning timber which fell from the roof. The vestry, where it is believed the fire originated, and the valuable organ and organ-loft above it, were completely burned out. Only the outer walls, some iron cupboards, and an iron safe resisted the flames. In the cupboards were stored the registers, which date back to the year 1568, and which afford much interesting information about the Great Plague of 1666 and other matters of history, while the safe contained the church plate, a very valuable collection, dating from the seventeenth century. All these interesting relics have, therefore, been saved. It was only two years ago that the edifice was restored at a cost of 6,500*l.*, 700*l.* of which was expended in rebuilding the organ, which is now only represented by the lead of melted pipes. The church was insured for a sum of 11,000*l.*, and the Rector calculates that this will more than cover the cost of repairing the damage which has been wrought by the fire. It is interesting to note that the parish church of Stepney was already in existence when St. Dunstan was Bishop of London, in 959, and after his death the church, which he rebuilt in 960, became associated with his name. The building as it stands to-day dates from the time of Edward IV. (1471-83), and is a good specimen of a Late Perpendicular country church, with some relics of its earlier days still preserved. The church, an imposing building, stands in its own grounds of seven acres, with a fine avenue of lime trees, under which such men as Dean Colet, founder of St. Paul's School, who was born in Stepney and was some time vicar of the parish, worked and conversed with Erasmus and other great Reformers of his day.

ANATOLIAN ANTIQUITIES.—The journey of exploration by Dr. Waldemar Belck has been successful thus far. At Amassia, in Anatolia, where the celebrated Royal tombs are situated, he discovered a new Greek rock inscription of the great King Pharnaces, the son of Mithridates. The rocky fort was, to the ancient world, impregnable. A nine days' trip brought Dr. Belck to Tokat, another strong rocky fortress, and then to Guemenek (Poutica), where he measured the temple ruins. Thence he went to Niksar—Neo Cæsarea, the old Cabira—a very strong fortress, where Mithridates' treasury was kept. On his return, he travelled via Herek (Eupatoria) and Ladik, the ancient Laodicea, which played a part in Cæsar's swift campaign against King Pharnaces—"*Veni, vidi, vici*"—in the year 47 B.C., and also four years later, during the campaign of revenge against Cassius.—*Standard.*

ELECTRIC LIGHTING, HEBBURN-ON-TYNE. — Messrs. Warren, Beattie, & Co., of Middlesbrough, have secured the contract for the supply and erection of the motors and cabling in connexion with the electric-power installation about to be put down by Messrs. Robert Stephenson & Co., Limited, at their shipyard at Hebburn-on-Tyne. This comprises thirty-nine motors, varying in power from 6 to 50 horse-power, the main switchboard, distribution boards, and all the cabling in connexion therewith. In addition to this, they have secured the order for the lighting of the shipyard, various shops, and offices. The lighting installation comprises sixty-eight arc lamps of 2,000 candle-power each, and over 550 incandescent lamps.

CLOSING OF LINCOLNSHIRE BRICKWORKS.—A serious depression in trade has overtaken the brick-makers of North Lincolnshire, whose works are studded along the banks of the Humber from Grimsby to Barton. The *Yorkshire Post* states that there was an overwhelming demand for bricks about two years ago, the price ranging from 30*s.* to 35*s.* per thousand, and the pressure was such that it was not uncommon for bricks to be shipped hot from the kiln. This prosperous state of the trade led to eight new yards being started, and now that a slump has occurred the adversity is correspondingly wide-spread. In the various yards there are many millions of bricks stacked, and some makers have their whole season's output on their hands. A very disagreeable fact is that at Barrow Haven, Messrs. Turner have closed their three yards for an indefinite period, thus throwing a large number of men out of employment. Winter is the time to "get" the clay to make up in the following season, and this means that Messrs. Turner will "get" none this winter, so it is evident that they do not view the immediate future very hopefully. Many other yards in the vicinity have practically ceased working. Another class of traders seriously affected by this state of affairs are the keel-owners and sailors of the district, as most of the transit is by water. Should the coming winter prove a severe one, the situation will be rendered acute for all concerned in the brick trade.

THE DRAINAGE OF SAUNDERSFOOT, TENBY.—At a recent meeting of the Narberth Rural District Council, Dr. W. Clement Evans, Medical Officer of Saundersfoot, reported an outbreak of scarlet fever amongst the children attending the Cresselly School. Seven cases had occurred in four families up to the present, and the school had been closed since the 23rd ult. There had been four other cases of scarlet fever, one at Begelly, one at Catershookgate, and two at the Lower Level. Five cases of typhoid fever had occurred, one at Cross-lanes, one at Begelly, and three at Saundersfoot. The case at Cross-lanes was evidently imported, as the girl came home ill from Merthyr. The case at Begelly proved fatal. He made a thorough examination of the premises and surroundings, and found a drain, which led from a slaughter-house, emptying on the side of the hill and overlooking Begelly Bottom. The well, too, which supplied some of the water was in great need of being protected from surface drainage and decaying vegetable matter, the water tasting very peaty. Whether this case was due to this or to the drain, he was unable to say, but both the well and the drain ought to be looked into. As to the cases at Saundersfoot, he firmly believed the state of the closets and the drains of Saundersfoot were responsible for this outbreak. In conclusion, he stated:—Some time ago I recommended you to erect a public slaughter-house for this parish or group of parishes. These private slaughter-houses are becoming an intolerable nuisance, and more so as they are becoming more numerous. There is not one of the present slaughter-houses in my district either constructed or kept as the law requires them, and unless they are constructed and plentifully supplied with water, they cannot be kept clean.—*Tenby Observer.*

ARTIFICIAL STONE IN GERMANY.—According to a Consular report to the Government of the United States, the artificial building-stone industry has taken a considerable development in Germany. The raw materials are lime, preferably hydraulic, and sand—the cleaner the better. After grinding, the lime is mixed with the sand in the proportion of 4 to 6 per cent. of the total bulk. The mixture is then pressed into bricks and transferred to a steel drum, where it is subjected to the action of steam at a pressure of about 120 lb. per square inch for about ten hours. Under the action of the steam a silicate of lime is formed which acts as binding material. The bricks are ready for use on removal from the drum in question. Mouldings are as easily produced as rectangular work. The bricks thus manufactured are said to be both cheaper and stronger than ordinary brick, the crushing strength being about 500 tons per square foot. The factory needed is small, as compared with the output, and work can be carried on all the year round.

DAMAGE TO TRURO CATHEDRAL.— It has been reported that certain cracks have appeared in some of the Bath stone of the bases of the pillars of the nave. The committee, in conjunction with the architect and contractor, are thoroughly and carefully dealing with the defects and their remedy, and they feel assured that the matter will be brought to

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a satisfactory conclusion. There is not anything amiss with the foundations, nor is there any indication of a settlement in the fabric, and the cracks are perfectly stationary, and show no signs of extending themselves. Not the slightest apprehension exists as to the security of the nave. Excellent progress is reported in the building of the central tower.—*Cornish Telegraph.*

CAPITAL AND LABOUR.

SWANSEA BUILDERS' LABOURERS' STRIKE.—The Swansea builders' labourers six months ago demanded ½d. per hour advance, which was refused, and the men came out on strike. Offers and counter-offers have since been made, arbitration has been refused, and the intervention of a third party unsuccessful. The employers will concede ½d. advance in August next, providing the men will sign on for four years. This offer has now been unanimously rejected, and in all probability the strike will last throughout the winter. In a few cases the advance asked for is being paid, but an effort is being made to get the whole of the labourers engaged in the town to leave work, and so form an organised resistance to the progress of any building operations. Both sides are determined not to give in. The men are being supported by the National Gasworkers and General Labourers' Union. It is estimated that the strike has cost altogether 5,000*l.*—*Daily Express.*

LEGAL.

TRESPASSERS ON BUILDING LAND:

A QUESTION AS TO RESPONSIBILITY AND RISK.

AT Brompton County-court on Monday, before Judge Stonor and a jury, James Booker, a builder's labourer, 29, Byam-street, Fulham, S.W., brought an action against Mr. Joseph Wilson, builder and contractor, 126, Stephendale-road, and Elswick-street, Fulham, claiming damages in respect of personal injuries sustained, owing, it was said, to negligence on the part of the defendant or his servants.

Mr. S. W. Lambert, counsel, appeared for the plaintiff, and Mr. Colam, counsel, defended.

Plaintiff's counsel explained that the defendant was the owner of a large estate bordered by Stephendale-road, Bagley's-lane, and Elswick-street, Fulham. In April last a large portion of the land was not built upon, and it appeared that for some six or seven years previously the public had been in the habit of walking across the land in order to cut off a corner. At one time, it was alleged, a fence had been put up to prevent any one going upon the land, but in April last, and for a long time previously, there was no fence whatever. On April 17 last, late at night, the plaintiff, who for some four years had been accustomed to using the path across the land, had occasion to go to Sand's End, and when about half-way along the path he suddenly fell down a gravel pit which had been dug right in the line of the path. The man seriously injured his shoulder, and was not yet able to resume his work.

The plaintiff bore out his counsel's opening statement.

In answer to the Judge he said that he walked across the land about a fortnight prior to the accident, and the nearest gravel pit was then some 30 ft. or 40 ft. from the path.

In cross-examination the plaintiff stated that there was no notice upon the land warning the public not to trespass, or that the path was dangerous. He had been in the employment of the defendant for a time, and was well aware that there were gravel pits in the field, but he was not aware that the pits were near what he considered to be a public footpath across the land.

Thomas Crawley, a builder's labourer, stated that there was nothing to warn the public of the hole, which could not be seen in the dark as one walked along the path.

Police Inspector Holton stated that about two years ago a fence had been put up on the land, but it was pulled down—he believed by boys—almost immediately afterwards. He had often seen the public using the path across the land.

Cross-examined: No one could accidentally wander from the public footway on to the defendant's land, because the latter was several inches lower than the pavement. There was no well-defined path across the land; people walked across it in various directions. He had never seen a notice warning people not to trespass upon the land. The plaintiff had evidently been drinking on the night of the accident.

F. H. Manning, a sanitary inspector in the service of the Fulham Borough Council, stated that he, as the general public appeared to do, had used the path in question.

Other witnesses gave similar evidence, and two medical men spoke as to the plaintiff's injuries.

Mr. Colam submitted that the defendant could not be held liable in the present case unless it was shown either that the public had a right-of-way across the land, or that there was an invitation to the public to use the path—as in the case of a path leading to a shop or factory—when the hole in question would have been of the nature of a trap In the present instance, however, any one using the path was a trespasser. If the evidence had been that a person was likely inadvertently to stray from the public footway on to the land, there might then have been a case to go to the jury.

The Judge: But the defendant appears to have tacitly acquiesced in allowing the public to use the path for two or three years or more. Knowing that people went along the path day and night, they enlarged the pit across the path. I think it a very doubtful point. The question is whether they did not invite the public to use it. It appears that at one time they attempted to stop the public going across the land, but when the boys broke down the fence the defendant appears to have given in and let the public use the path. It does not seem that the public would be trespassers upon the land until it was fenced in again.

Mr. Colam: But if I go across another man's land I am a trespasser. Suppose I sued this man for trespass, could he set up a defence of leave or license? The cases bearing upon the point set up this principle: If you dig a pit, or put a trap so near the public highway that a person without negligence may inadvertently stray, and get into the hole or trap, then you are liable.

The Judge: The public were allowed to use this path.

Mr. Colam: No, your Honour. We could not help them using it. Does your Honour know of any duty on the part of a landowner to put up such a fence that people cannot pull down? Surely, we may assume that persons who trespass upon our land must use their eyes and take the risks. It is the duty of the person who leaves the high road and goes on to my land to see where he goes; it is not my duty to provide light for him.

Mr. Lambert submitted that in the present instance the hole constituted "something in the nature of a trap." The defendant acquiesced in the public going along the path. The learned counsel went on to quote several cases in support of his contention.

Mr. Colam: I do not agree with my learned friend. I say that I have a right to assume that if a person trespasses on my land in the daytime he must take every care, and if he trespasses and injures himself in the dark he must take the consequences.

The Judge: I think that is so. It appears to be a case where the hole was not a trap. The builder was only using his land in a proper way, and he had a right to assume that a person would not trespass upon the land, especially in the dark. The plaintiff must be non-suited.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

10,937.—WINDOW FASTENINGS: *W. Rundell.*—A fastening-arm is pivoted on to an angle-plate upon the meeting-rail of the lower sash. A hook at the end of the arm engages with the bar of a catch-piece upon the upper sash, the arm can be moved backwards and the sashes can be drawn together with a screw, a slot being cut in the arm for the pivot, and the window may be fastened, when it has been opened, with additional catch-pieces affixed to the middle upright.

10,999.—A FIRE ALARM: *H. G. Lyngaas.*—When the temperature exceeds a certain limit an electrical bell circuit will become closed by means of a plate which is cemented with wax to a wire-gauze disc arranged in front of an opening. As the wax is melted the plate is lifted with a spiral spring, and so brings about the meeting of two contact-pieces for the closing of the circuit.

11,007. — CONSTRUCTION OF BREAKWATERS, GROYNES, &C.: *E. M. L. Case.*—Plates hold wooden planks or metallic sheets together near their one end, and projecting plates are fitted upon each side of their other end so as to enclose the piles when driven in; lugs on the underside hold a V-shaped or channel-shaped shoe, and a similar weighting-piece is placed above; the piles, tubular in form, should be screw-threaded internally so that their lengths may be joined together.

11,014.—A PLASTIC COMPOSITION FOR BUILDING PURPOSES: *W. T. Symons.*—A plastic compound to be moulded into floors, tiles, mantelpieces, and so on consists of an admixture of granulated cork or wood, saturated sugar of lime, cement, and oxidised oil, or other binding material.

11,026.—AN ELECTRICAL CORD GRIP: *A. P. Lundberg and G. C. Lundberg.*—The grip has a screwed portion, which has grooves that will take the two conductors separately and a plug or nut for holding the conductors in the grooves. For attachment of the grip to a wall plug, the screwed portion is fashioned so as to project from a flat surface against which one can clamp the conductors. The appliance will serve for the coupling-plugs of lamp-holders and for ceiling roses, pear switches, &c.

11,032.—A CONTRIVANCE FOR FASTENING WINDOWS, GATES, DOORS, DRAWERS, &C.: *G. C. Smith.*—For retaining the sash in any position required is utilised the end pressure of a plate upon the end of a shaft that is jointed to a bar having a quick thread mounted in a fixed nut. The plate will be drawn inwards when the handle is raised, and adjustment of the window can be effected, the plate being returned with springs to the position for locking. A bolt that forms part of a rack, worked with a key will prevent the handle from being lifted. For a door, the bar is rotated with inside and outside handles.

11,046.—TREATMENT OF SEWAGE: *E. Burmeister.*—To sewage and similar foul effluents are added carbonate of lime and slaked lime, which will also serve for deodorising and disinfecting purposes. The resultant calcareous precipitate may be used again, instead of fresh carbonate of lime, in respect of another quantity of sewage.

11,048.—WINDING AND HOISTING MECHANISM: *R. Grisson.*—In order to provide for two speeds the inventor fashions the barrel in two parts, having different diameters, and keeps them asunder with a flange in which is a slit. When the barrel is turned in one direction the hauling-rope is wound upon one drum, and *vice versâ.*

11,059.—A GAS-BURNER: *F. J. Beaumont.*—The atmospherical burner, for lighting or cooking, is joined to the burner tube at its one side with a chamber fashioned in two parts, and at its other side to the gas-jet. One part of the chamber has a partition on to which is pivoted a light fire-proof flap which will open easily for admitting gas and air, but will be closed by any back pressure—thus "lighting back" is obviated. In another shape a small box is screwed into the enlarged burner tube, having at its inner end a light flap slightly inclined, and at its outer end a gas nozzle and air-inlet holes.

11,084.—A FLUSHING SYSTEM FOR URINALS: *T. W. Twyford.*—Around the top of the urinal is a gutter into which a pipe delivers the flush and from which the flush overflows down the sides. The gutter is concealed by the overhanging coping stone. In one shape the service-pipe is inserted in the back of the stall and an opening upon a T-piece fits into a conical opening upon the pipe, a screw keeps the lips together, and the overhanging coping stone forms a recess for the sparge-pipes.

11,087.—A TWO-WAY VALVE FOR FLUSHING APPARATUS: *T. W. Twyford.*—A two-way distributing valve consists of a triangular box, having a flushing inlet and side outlets to the flushing-rims, and provided with a hinged flap. When in its middle position the flap will leave both of the outlets opened, but when in its extreme positions it will leave one or the other of the outlets closed.

11,088.—AN APPARATUS FOR WINDOWS: *A. A. Weir.*—The apparatus is devised for opening and shutting pivoted sashes and skylights. A slightly curved rod joins the sash to a nut that is traversed by the twisting of a screw mounted in two fixed brackets, which are set apart at a distance about equal to the length of the rod, and worked with cords passing around a pulley upon the lower end of the screw, and thence around two guide-pulleys upon the lower bracket; a slot in the upper bracket provides for the passage of the curved rod.

11,118.—A MITERING BLOCK: *J. W. Oliver.*—The block is fitted with a knife, having inclined edges, reciprocated with a rack and pinion attached to the lever. The pinion will gear on one side with a rack upon the back of the knife, and upon the other side with a fixed rack. A spiral spring returns the knife to a middle position, and spiral springs press the gauge-plates against posts around which they can be turned and clamped at any angle desired.

11,137.—DUST-BINS: *G. Olliver.*—The bin has sides that taper upwards. The arms of the lid have slotted ends for engagement with a spindle that is held in a bracket, or they may have holes in their ends for adjustment upon vertical pins.

11,151.—A CHIMNEY-TOP: *J. Smith.*—A flanged cover provided with openings is fitted on the top of the chimney stack, and a chimney pot is secured in each opening by means of a sleeve on the pot and a collar on the cover. In a variant form the cover and the pots are made in one piece.

11,167.—AN APPLIANCE FOR USE IN SHARPENING AND SETTING SAWS: *A. C. Saxton.*—In order that the saw may be adjusted quickly in the clamp of the machine a feeding-rack is made on one edge of the slide that clamps the saw, and it is set in place by pressing a tooth into gear upon a transverse slide. Then a tooth upon another similar slide is forced into gear with the teeth of the saw, which can be clamped with screws in its slide as soon as the contact adjustment is found to be correct.

11,190.—ELECTRICAL SWITCHES: *Siemens and Halske A-G.*—In a switch for high-potential currents wherein the arc is to be extinguished by being drawn within a tube of some insulating material a rod is used for connecting the contacts respectively, a metal ring upon the insulating tube will tend to prevent the latter from become overheated.

11,193.—A CONTRIVANCE FOR WINDOW SASHES: *A. J. Skillman.*—Centrical horizontal pivots between sliding stiles carry each sash, which will be held in a vertical plane between the stiles by means of slips which parallel links join to the rebated sash-stiles; the slips are moved outwards, so as to clear the sash, when one wishes to turn the sash upon its pivots.

11,222.—TESTING APPARATUS FOR DRAINS: *R. Ravenor.*—The smoke-test apparatus comprises a cylinder, having an inlet from the blower and an outlet to the drain, which carries the rocket, and there is water beneath for extinguishing sparks, &c. For high-pressure work the bell is removed and a pump—a cycle pump, for instance—is joined up to an inlet in the screw-cap, a gauge being used for indicating the amount of pressure. For low-pressure

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work either a gauge or a bell working in an annular sealing-groove is used.

11,272.—APPLIANCES FOR USE WITH ELECTRICAL LIFTS: *J. Hofbauer.*—The inventor seeks to furnish means of gradually starting the motor as the well door is closed, and of preventing the motor from being started whilst the well door remains opened. When all the doors are shut the motor-circuit is completed by means of contacts and the arms upon the well doors, but the opening of any one door will break the circuit, thereupon, all the other doors being shut, the shutting of that one door completes the circuit through the contacts in turn, the resistances are gradually cut out, and the motor is started.

11,303.—A CONTRIVANCE FOR VENTILATORS: *W. B. Johnson.*—The vanes, either curved or straight, of the ventilator can be secured at the angles desired or be held with pivots for their adjustment. The lowest vane is so constructed that it will quite shut the inner face of the ventilator—it is pivoted on to the ends of long arms for which a free movement is provided by cutting away the sides of the other vanes, or by pivoting the other vanes upon side brackets.

11,376.—MANUFACTURE OF BRICKS, DRAIN-PIPES, TILES, &C.: *C. Chandler*—The articles are made of dry or damp cement mixed with brick *débris*, stone, clinker, and similar waste material; after they have been moulded under pressure they are put into a hard water or a liquid charged with alum, soda, silicate of soda, sal-ammoniac, and so on, for hardening the binding material.

11,403.—A METHOD OF FIXING FACING-TILES: *J. A. Dobbie.*—For affixing the tiles on to walls, ceilings, and similar surfaces, the inventor screws through their middle portions and covers the heads of the screws with plugs that have projecting stems which will fit into holes countersunk in the tiles, or may be recessed so as to take the heads of the screws.

MEETINGS.

FRIDAY, OCTOBER 18.

Architectural Association Discussion Section.—Mr. H. G. Collins on "Stables and Stable Fittings." 7.30 p.m.

MONDAY, OCTOBER 21.

Architectural Association of Ireland.—Exhibition of prize and class drawings at 20, Lincoln-place, Dublin (open till the 26th).

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 20.—By Messrs. SPELMAN (at Norwich).

Norwich – 2, Cow-hill, f. £260
Norwich Union Fire.—8 100*l.* shares (12*l.* paid) .. 817

September 25.—By Messrs. KEMSLEY (at Romford).

Romford, Essex.—52, South-st., f. 925
Hornchurch, Essex.—1 and 2, Donington-villas, f. 470
1 and 2, Denham-villas, f. 415
1 and 2, Eastcote-villas, f. 410
1 and 2, Liscard-villas, f. 395
1 and 2, Peel-villas, f. 375
South Essex Waterworks.—100*l.* Five per Cent. Preference Stock 125

By JAMES T. PEAT (at Reigate)

Kingswood, Surrey.—Mogador, an enclosure of freehold land, 2¾ acres 225

September 25 and 26.—By BARBER & SON (at Wellington).

Wellington, &c., Salop.—The Wombridge Estate, area 427 a., f. (in numerous lots) 32,595

September 26.—By DOUGLAS YOUNG & Co. (on the Estate).

Chingford.—Eglington-rd., twelve plots of building land, f. 860
Connaught-av., Inversnaid, f., e.r. 60*l.* 850
Connaught-av, four plots of building land, f. .. 308
Forest View, three plots of building land, f. .. 1,086
Gordon-rd., Ardrishaig, f. 1,000
Victoria-rd., thirty-one plots of building land, f. 2,480

September 27.—By A. J. SHEFFIELD.

Manor Park.—Fourth-avenue, Bournemouth, Lowestoft, and Hastings Villas, f. 840
Southend, Essex.—Hartington-rd., Oak Villa, f... 385
1 to 6, Victoria-rd., f. 700
Old Ford.—3, 4, and 5, Gernon-rd., u.t. 35½ and 37 yrs., g.r. 18*l.* 940
Brixton.—41, Akerman-rd., u.t. 42 yrs., g.r. 8*l.*, r. 60*l.* 720
133, Milkwood-rd., u.t. 64½ yrs., g.r. 3*l.* 10s., r. 30*l.* 340
Cubitt Town.—108 to 118 (even), Stebondale-st.; also i.g.r. 10*l.*, u.t. 49 yrs., g.r. 32*l.* 12s. 930
Mile End.—96, Harford-st., u.t. 56 yrs., g.r. 5*l.* .. 225

September 28.—By WALTON & LEE (at Carlisle).

Waterhead, Cumberland.—The Birdoswald Estate, 221 a. 3 r. 12 p., f. and c. 8,000
Lane cost, Cumberland.—The Bush Farm, 278 a. r. 20 p., f. 4,150

By EVANS & EVANS (at Stafford).

Sandon, Staffs.—The Romer Farm, 129 a. 2 r. 34 p., f. 5,800
The Grove Farm, 53 a. 3 r. 31 p., f. 3,550

By FOLEY, SON, & MUNDY (at Warminster).

Sutton Veny, Wilts.—Church Farm, 544 a. 2 r. 32 p., f. 4,300

September 30.—By FISHER, STANHOPE, & DRAKE.

Stoke Newington.—138, Osbaldeston-rd., u.t. 79 yrs., g.r. 9*l.*, e.r. 60*l.* 680
Stamford Hill.—68, Dunsmure-rd., u.t. 86 yrs., g.r. 8*l.*, e.r. 52*l.* 525
Homerton.—4A, Bushberry-rd., u.t. 83 yrs., g.r. 5*l.*, r. 65*l.* .....
Clapton.—20, Chardmore-rd., u.t. 87 yrs., g.r. 7*l.*, e.r. 50*l.* £515

By MAY & PHILPOT.

Streatham.—57, Palace-rd., u.t. 74½ yrs., g.r. 20*l.* 1,050
Brixton.—32, Helix-rd., u.t. 88½ yrs., g.r. 7*l.*, e.r. 45*l.* .....

By F. G. WHEATLEY & SON and DOWSETT, KNIGHT & Co. (on Estate).

Basingstoke, Hants.—Worting-rd., five plots of land, f. 530

October 1.—By BEARD & SON.

Notting Hill.—42 and 52, Bassett-rd., u.t. 73¾ yrs., g.r. 11., r. 200*l.* 1,870
Soho.—44, Dean-st., f., area 1,300 ft., r. 80*l.* 3,025

By GARRETT, WHITE, & POLAND.

Crouch End.—10 to 28 (even), Harringay-rd., f., r. 304*l.* .....

By WALTON & LEE.

Ashstead, Surrey.—Dorking-rd., Fountain Cottages f. 300
Street Farm House and 0 a. 2 r. 13 p., f. 410
Woodfield-rd, Woodfield Farm, 78 a. 3 r. 2 p., f. 950

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

North Woolwich.—The Royal Pavilion Hotel, u.t. 54½ yrs., r. 150*l.*, with goodwill..... 4,700

October 2.—By ARTHUR BARTON.

Hoxton.—34 to 42 (even), Rushton-st., u.t. 33 yrs., g.r. 23*l.* 5s. 28,000
Lewisham.—36, Albacore-cres., f., r. 30*l.* 1,250
157, Algernon-rd., u.t. 80 yrs., g.r. 4*l.* 10s., r. 32*l.* 460

By FIELD & SONS.

Bermondsey.—36 to 41, Bermondsey-st., u.t. 59½ yrs., g.r. 275*l.*, r. 485*l.* 330
10, Neckinger, and 88 and 89, Enid-st., u.t. 8, 13½ and 15½ yrs., g.r. 9*l.* 10s. .....
31, Stanworth-st., f., r. 26*l.* .....

By F. W. HARRISON.

Leicester-sq.—3, Leicester-pl., beneficial lease for 20½ yrs., r. 90*l.* 2,080

By J. HOOD & SONS.

Leytonstone.—80, Queen's-rd., u.t. 96 yrs., g.r. 6*l.* 6s., r. 38*l.* 200

By J. & W. JOHNSON & Co.

Walthamstow.—56 to 72 (even), Albert-rd., f. 320

By FRANK JOLLY & Co.

Clapton.—98, Clarence-rd., f., e.r. 80*l.* 2,810
Limehouse.—42, West India Dock-rd., f., e.r. 50*l.* 900
Stepney.—10 and 12, Apsley-st., u.t. 22 yrs., g.r. 5*l.* 6s. 8d. 600
Cubitt Town.—211 and 213, Manchester-rd., u.t. 49½ yrs, g.r. nil 310
24 to 30 (even), Gengall-rd., u.t. 40 yrs., g.r. 16*l.* .....
Poplar.—1 to 4, Marshfield-st., u.t. 40 yrs., g.r. 11*l.* 4s. 2,080
Stratford.—108, Forest-lane and 1, Wellington-rd., u.t. 68½ yrs., g.r. 7*l.* 10s. 200
By R. LONGSTAFF & Co. (at Boston).
Brothertoft, Lincs.—A freehold farm, 102 a. 0 r. 23 p. 320

By Messrs. IRELAND (at Reepham).

Hackford, &c., Norfolk.—The Rookery Farm, 177 a. 1 r. 15 p., f. and c. 3,550
The Pettywell Farm, 103 a. 1 r. 3 p., f. and c... 4,100
Ten freehold cottages 2,860
A copyhold residence, r. 15*l.* 595
Whitwell, Norfolk.—A small holding, 1 a. 1 r. 33 p., f. 210
Two houses, ten cottages and 2 a. 0 r. 14 p., f... 120
Four enclosures, 21 a. 3 r., f. 1,195
Reepham, Norfolk.—Two freehold houses 545

By DOUGLAS YOUNG & Co. (on the Estate).

Ilford, Essex.—Christchurch-rd., three plots of land, f. 160
Toronto-rd., eight plots of land, f. 450
Brisbane-rd., eight plots of land, f. 440
Coventry-rd., twenty-three plots of land, f. 464
Wellesley and Balfour-rds., five plots of land, f. 1,471
Quebec-rd., nineteen plots of land, f. 242

October 3.—By GEORGE BILLINGS.

Kilburn.—70, Willesden-ln., u.t. 85 yrs., g.r. 14*l.* 14s., r. 65*l.* 884
Hackney.—2, Blanchard-st., u.t. 46 yrs., g.r. 5*l.* 760
Brixton.—36, Aytoun-rd., f. 230

By J. E. FISHER.

Tooting.—9, Bickersteth-rd., f. 350
Burntwood-ln. (rear of), a plot of land, area ½ an acre, f. 290

By NEWBON, EDWARDS, & SHEPHARD.

Stoke Newington.—20 to 26 (even), Cooper-d., f., r. 128*l.* 210
St. Pancras.—84, Drummond st., u.t. 17 yrs., g.r. 20*l.*, e.r. 55*l.* 2,195
Hoxton.—141, East-rd., u.t. 46 yrs., g.r. 12*l.*, r. 75*l.* 105
Harringay.—55, Wightman-rd., u.t. 83½ yrs., g.r. 7*l.* 10s., r. 38*l.* 575
Holloway.—37, Orpingley-rd., u.t. 76 yrs., gr. 5*l.* 370
Cherry Hinton, Cambs.—A freehold house, bakehouse, and cottage, r. 20*l.* 215

By TOWERS, ELLIS, & Co.

Finchley.—Leicester-rd., f.g.r.'s 28*l.*, reversion in 83 yrs. 225
Lincoln-rd., f.g.r. 10*l.*, reversion in 83 yrs..... 670
Dulwich.—103, Croxted-rd., r. 55*l.*; also l.g.r. 5*l.* 2s. 4d., u.t. 62 yrs., g.r. 12*l.* 16s. 2d..... 245

October 4.—By REYNOLDS & EASON.

Rotherhithe.—231 to 239 (odd), Deptford Lower-rd., u.t. 50 yrs., g.r. nil, r. 200*l.* 100
Deptford Lower-rd., i.g.r. 6*l.* 5s., u.t. 50 yrs., g.r. 2*l.* 11s. 5d. 585
Mile End.—24, 26, and 28, Bridge-st.; also i.g.r. 4*l.*, u.t. 6 yrs., g.r. 10*l.* 180

By R. N. WHALEY (at Lincoln).

Bucknall, Lincs.—Hartings Farm, 131 a. 0 r. 23 p., f. 2,665
1,800

October 7.—By WM. HOUGHTON.

Woodford.—Whitehall-rd., Langbourne Lodge and 5 a. 2 r. 37 p., f. 100
Walthamstow.—1, Mansfield-rd. and premises adjoining, f. 3,185

By FRED. VARLEY.

Highbury.—21, Mentone-rd., u.t. 63 yrs., g.r. 7*l.*, e.r. 50*l.* 450
Crouch Hill.—8, Almington-st., u.t. 69 yrs., g.r. 6*l.*, r. 39*l.* 530
Holloway.—45, Corbyn-st., u.t. 69 yrs., g.r. 5*l.* 10s. 270
260

October 8.—By H. DONALDSON & SON.

Islington.—281 to 287 (odd), Liverpool-rd., and 1 and 1a, Lofting-rd., u.t. 7½ yrs., g.r. 16*l.*, r. 260*l.* £700
Kingsland.—463, Kingsland-rd., u.t. 24 yrs., g.r. 60*l.*, r. 38*l.* 350
6 and 8, Englefield-rd., u.t. 24 yrs., g.r. 10*l.*, r. 64*l.* 470
Dalston.—14, Wayland-av., u.t. 64 yrs., g.r. 5*l.* 15s., r. 38*l.* 375

By GENDLE & SON.

Wimbledon.—49, South Park-rd., f., e.r. 55*l.*..... 650
30 to 44 (even), Cowper-rd., u.t. 92 yrs., g.r. 25*l.* 4s. 1,075
36, Haydons Park-rd., u.t. 87 yrs, g.r. 5*l.*, e.r. 30*l.* 280

By E. G. HUNT.

Notting Hill.—374, Ladbroke-grove, f. 280

By JONES, SON, & DAY.

Limehouse.—Grenade-st., f.g.r. 6*l.* 10s., reversion in 1¾ yrs. 515
Gill-st., f.g.r.'s 34*l.* 17s., reversions in 1¾ and 2¾ yrs. 2,550

October 9.—By DUNCAN & KIMPTON.

Portman-sq.—15 and 23, George-st., u.t. 23 yrs., g.r. 80*l.*, r. 225*l.* 1,560

By GREEN & SON (Hammersmith).

Watford, Herts.—23 and 24, Carey-pl., f..... 460

By ROGER BROS.

Forest Hill.—17, Dalmain-rd., u.t. 60 yrs., g.r. 4*l.* 10s., r. 26*l.* 145
24 to 30, Chaplin-st., u.t. 59 yrs., g.r. 26*l.* (including mortgage)..... 770
Peckham.—41 to 49 (odd), Haymerle-rd., u.t. 73 yrs., g.r. 25*l.* 1,000
94 to 100 (even), Adys-rd., u.t. 73 yrs., g.r. 24*l.*, r. 132*l.* 1,415

By SKILTON & GOULDEN.

Catford.—8 to 18 (even), Lower Winchester-rd., u.t. 92 yrs., g.r. 30*l.*, r. 156*l.* 1,330

By T. B. WESTACOTT.

Holloway.—162, Holloway-rd., f., r. 180*l.*..... 4,030
Camden Town.—1A, Murray-st., u.t. 43 yrs., g.r. 10*l.*, e.r. 52*l.* 370

By RAVENSHEAR & MASSY.

Ealing.—Albert-villas, f.g.r.'s 15*l.*, reversion in 98 yrs. 365
Uxbridge-rd., f.g.r. 4*l.*, reversion in 83 yrs. 100
Uxbridge-rd., f.g.r. 9*l.*, reversion in 77 yrs. 350
Uxbridge-rd., f.g.r.'s 25*l.*, reversion in 83 yrs. .. 700
Uxbridge-rd., f.g.r.'s 35*l.*, reversion in 83 yrs. .. 1,235
Bedford-rd., f.g.r.'s 84*l.* and peppercorn g.r.'s, reversion in 77 yrs. 2,115
Bedford-rd., &c., f.g.r. 14*l.*, reversion in 83 yrs. 460
Alexandra-rd., f.g.r.'s 14*l.*, reversion in 83 yrs... 375
Connaught-rd., f.g.r.'s 91*l.*, reversion in 83 yrs. 2,375
Bayham-rd., peppercorn g.r., reversion in 83 yrs. 230
Williams-rd., f.g.r.'s 32*l.*, reversion in 77 yrs. .. 780
Hope-rd., f.g.r. 7*l.* 10s., reversion in 77 yrs..... 210

October 10.—By CHESTERTON & SONS.

Kensington.—3, St. Albans-rd., u.t. 29½ yrs., g.r. 9*l.*, r. 100*l.* 1,420

By C. C. & T. MOORE.

Forest Gate.—375, Upton-lane, f., e.r. 75*l.* 1,050
Plaistow.—7, Richmond-st., area 3,300 ft., c. 415

By NEWBON, EDWARDS, & SHEPHARD.

Notting Hill.—36, St. Mark's-rd., and 138, Chesterton-rd., u.t. 73½ yrs., g.r. 8*l.*, r. 80*l.* 1,080
Islington.—139 to 145 (odd), Cloudesley-rd., u.t. 24 yrs., g.r. 14*l.*, r. 104*l.* 480
Holloway.—65, Parkhurst-rd., u.t. 21½ yrs., g.r. 10*l.*, r. 72*l.* 325
212, Tufnell Park-rd., and 40, Warrender-rd., u.t. 55 yrs., g.r. 5s., r. 90*l.* 1,530
Highbury.—129, Highbury-new-park, u.t. 48 yrs., g.r. 12*l.*, e.r. 90*l.* 525
Finsbury Park.—116, Queen's-rd., u.t. 75 yrs., g.r. 10*l.* 10s., e.r. 75*l.* 670
Dalston.—56, Albion-rd., u.t. 40 yrs., g.r. 6*l.* 10s., e.r. 40*l.* 375
Tottenham.—281, High-rd., u.t. 75 yrs., g.r. 8*l.* 8s., e.r. 38*l.* 275

By POWELL & POWELL.

Bayswater.—31 and 32, Caroline-pl., u.t. 15 yrs., g.r. nil 290

By STIMSON & SONS.

Dulwich.—48, East Dulwich-rd., area 10,000 ft., f. 800
Holloway.—47, Nicholay-rd., u.t. 76 yrs., g.r. 6*l.*, r. 35*l.* 320
Crouch Hill.—Ashley-rd., f.g.r. 8*l.*, reversion in 74 yrs. 225
Winibledon.—19, Herbert-rd., f., e.r. 36*l.*..... 540
Bermondsey.—Lynton-rd., Lynton Cottage, u.t. 55 yrs., g.r. 7*l.* 10s., r. 52*l.*..... 385
111 and 113, Fort-rd., u.t. 23 yrs., g.r. 7*l.* 380
132, Jamaica-rd, f., r. 45*l.*..... 525
Old Kent-rd.—27, Hatcham-rd., f., r. 26*l.* 275
Selhurst.—40, Dagnall-pk., area ½ a., f..... 720
Norwood.—42 and 44, Albert-rd., u.t. 78 yrs., g.r. 10*l.* 180
Lewisham.—38, 40, and 42, Knowles Hill-cres., u.t. 67 yrs., g.r. 12*l.*, r. 65*l.* 480

By FULLER, MOON, & FULLER (at Croydon).

Thornton Heath.—Langdale-rd., 6 plots of land, f. 540
Bridport-rd., 2 plots of land, f..... 136
Croydon.—196, Brighton-rd., f., r. 35*l.* 505
Tooting.—45, High-st., f., r. 45*l.* 970

October 11.—By HUNTER & HUNTER.

Hyde Park.—34, Craven-ter., f., r. 130*l.* 1,750
Hammersmith.—54, Caithness-rd., u.t. 88 yrs., g.r. 8*l.* 530
Stockwell.—Stockwell Park-rd., i.g.r. 14*l.* 8s., u.t. 40 yrs., g.r. 7*l.* 120

By MULLETT, BOOKER, & Co.

Hyde Park.—62, Westbourne-ter., and 62, Gloucester-mews East, u.t. 35¾ yrs., g.r. 35*l.*, r. 250*l.* 2,350
82, Westbourne-ter., u.t. 36 yrs., g.r. 5*l.*, r. 230*l.* 2,150
14, Upper Westbourne-ter., u.t. 47½ yrs., g.r. 8*l.*, r. 65*l.* 500
Acton.—30, Brougham-rd., f., r. 30*l.* 425

By A. W. TAYLOR & Co.

Romford.—Globe-rd., Lynwood House, f., r. 25*l.* 400

Contractions used in these lists.—**F.g.r.** for freehold ground-rent; **l.g.r.** for leasehold ground-rent; **i.g.r.** for improved ground-rent; **g.r.** for ground-rent; **r.** for rent; **f.** for freehold; **c.** for copyhold; **l.** for leasehold; **e.** for estimated rental; **u.t.** for unexpired term; **p.a.** for per annum; **yrs.** for years; **st.** for street; **rd.** for road; **sq.** for square; **pl.** for place; **ter.** for terrace; **cres.** for crescent; **yd.** for yard.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Isolation Hospital	Burslem Corporation	100*l.* and 50*l.*	Dec. 30
*New Art School	Hull Corporation	100*l.*, 60*l.*, and 40*l.*	Jan. 31
*New Buildings, and Laying-out and Fencing Field	Governors, Northampton School	25 guineas to second	No date
*Municipal Buildings	Stockport Corporation	Not stated	do.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
House, Fitzhamon Embankment, Cardiff	The Rev. H. A. Coe	Veall & Sant, Architects, Cardiff	Oct. 22
Cemetery Wall, Ongar-road	Brentwood (Essex) U.D.C.	J. E. Fothergill, Surveyor, Town Hall, Brentwood	do.
Goods Shed, Leamington	Great Western Railway Co.	G. K. Mills, Paddington Station, W.	do.
*Roadmaking Works	Bromley U.D.C.	Surveyor, District Council Offices, Bromley, Kent	do.
*Additions to Hospital	Willesden District Council	O. Claude Robson, Engineer, Dyne-road, Kilburn	do.
Road Metal	Barnard Castle U.D.C.	J. I. Dawson, Council Offices, Barnard Castle	do.
Reroofing Art Gallery, Lichfield-street	Wolverhampton Corporation	Borough Engineer, Town Hall, Wolverhampton	do.
Sewers, &c., High-street	Ilfracombe U.D.C.	C. G. Barnett, Town Hall, Ilfracombe	do.
*Sewage Work	Stansted District Council	J. M. Knight, 35, Bancroft-road, Mile End, E.	Oct. 23
House	Abbotskerswell (Devon) Sch. Bd.	S. Segar, Architect, Union-street, Newton Abbot	do.
Warehouse Roof, &c.	Stockton-on-Tees Corporation	Borough Engineer, Borough Hall, Stockton	do.
Hotel, Inverurie, N.B.	Londonderry Co-op. Society	G. Gray, Architect, 133, High-street, Inverurie	do.
Additions to Business Premises	Edinburgh Water Trustees	Secretary, 59, Strand-road, Londonderry	do.
Additions to Nos. 8 to 16, St. Giles-street	Mr. R. Newman	D. & J. Bryce, Architects, 131, George-street, Edinburgh	do.
Road Works, Harlington, Hounslow	Kilkenny R.D.C.	C. W. Manning, Surveyor, London-road, Ashford	do.
Culvert, Damma	Mr. G. E. Moser	K. Comerford, Council Offices, Kilkenny	Oct. 24
Additions to House, High Nibthwaite	Appleby Trust	J. Stalker, Architect, Kendal	do.
Alterations to Cottages, Alnmouth	Aston Manor U.D.C.	G. Reavell, jun., Architect, Alnwick	do.
Schools, Fylde-road, Preston	Richmond (Surrey) Town Council	W. H. Dinsley, Architect, Cleveland-street, Chorley	do.
Lavatory, Aston Park	Foster's Trustees	G. H. Jack, Civil Engineer, Council House, Aston Manor	do.
Villa, Nairn, N.B.	Carnarvon Town Council	C. C. Doig, Architect, Elgin	do.
Sewers	Warrington Corporation	J. H. Brierley, Borough Surveyor, Town Hall, Richmond	do.
Street Works, Marlborough-street, Londonderry	Salford Guardians	M. A. Robinson, Civil Engineer, Richmond-street, Londonderry	do.
Clock Tower at the Guildhall	Durham Standing Joint Comtee.	E. Hall, Borough Surveyor, Carnarvon	do.
Reservoir Works	do.	J. Deas, Civil Engineer, Municipal Offices, Warrington	do.
Alterations, &c., to National Schools, Youghal	West Hartlepool Corporation	R. Walker & Son, Architects, 17, South Mall, Cork	do.
Galvanised Roofings, &c., Hope	Chorlton, &c., Joint Committee	F. Townson, Union Offices, Salford	Oct. 25
Police Court, Hebburn	North Shields Indus. Soc., Ltd.	W. Crozier, Civil Engineer, Shire Hall, Durham	do.
Police Station, Southwick-on-Wear	Glasgow Corporation	do.	do.
Sewerage Works, York-road	Blackpool Corporation	J. W. Brown, Borough Engineer, Town Hall, West Hartlepool	do.
Alterations to Carmel Methodist Chapel, Aberavon	Llandudno U.D.C.	G. P. Davies, Architect, Station-road, Port Talbot	do.
Sheds, &c., Ancoates	Rochford Union	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	do.
Additions to Golf View Hotel, Nairn	Great Northern Rly. Co. (Ireland)	C. C. Doig, Architect, Elgin	do.
Additions to Schools, Thorpe-le-Soken, Essex	do.	C. E. Butcher, Architect, 3, Queen-street, Colchester	Oct. 26
Business Premises, Whitley	Broughton School Board	Hope & Maxwell, Architects, Saville-street, North Shields	do.
Roof at Depot, Coplawhill	Selby (Yorks) U.D.C.	Sir J. D. Marwick, City Chambers, Glasgow	do.
Granite, &c., Road Metal (6,000 tons)	Chalford School Board	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool	do.
Cast-iron Pipes	Horbury (Yorks) U.D.C.	E. G. Stephenson, Civil Engineer, Council Offices, Llandudno	Oct. 28
*Women's Wards at Workhouse Infirmary	Glasgow Parish Council	Greenhalgh & Brockbank, Architects, Southend-on-Sea	do.
Roof Works, Great Victoria-street Station	Darlington Corporation	T. Morrison, Amiens-street Terminus, Dublin	do.
Station Master's House, Moira	Eastbourne Corporation	do.	do.
Schools, Brynteg, near Wrexham	Willenhall U.D.C.	R. J. Kendrick, 1, Henblas-street, Wrexham	do.
Sewers, &c.	British Electric Traction Co., Ltd.	B. M. Gray, Civil Engineer, Town Hall, Selby	do.
Schools, Chalford Hill, Glos.	Pontypool Guardians	V. A. Lawson, Architect, 17, Rowcroft, Stroud	do.
Offices, &c.	Otley (Yorks) U.D.C.	W. Hanstock & Son, Architects, Branch-road, Batley	do.
Hospital, Duke-street	Brentford Union	J. Baxter, 243, St. Vincent-street, Glasgow	do.
Farmhouse, Cowbridge, Wales	Fulham Council	D. Evans, Eastbourne House, Cowbridge	do.
Lavatory, Market Place	Commissioners of H.M. Works, &c.	Borough Surveyor, Town Hall, Darlington	do.
Sanitary Conveniences, Grand Parade	Wandsworth & Clapham Union	R. M. Gloyne, Civil Engineer, Town Hall, Eastbourne	do.
Disinfecting Station at Outfall Works	Middlesex County Council	T. E. Fellows, Civil Engineer, Town Hall, Willenhall	do.
*Car Shed, Workshops and Offices, Northfleet	Edinburgh, &c., Water Trustees	Chief Engineer, Donington House, Norfolk-street, W.C.	do.
*Purchase of Mansion	G. R. Fitzroy Cole, Esq.	W. Newton Dunn, Architect, 1, Bucklersbury, E.C.	do.
Chimney Stacks, Griffithstown	Lancashire Asylums Board	T. Watkins, Union Offices, Pontypool	Oct. 29
Reservoir, &c., Middleton	Barrow-in-Furness School Board	J. Waugh, Civil Engineer, Tunbridge Chambers, Bradford	do.
*Iron Escape Staircase	Tottenham U.D.C.	Clerk to Guardians, Union Offices, Isleworth, W.	do.
*Making-up and Paving Roads	Devizes Joint Hospital Committee	C. Botterill, Surveyor, Fulham	Oct. 30
*Sorting Office for Postmen, Brockley	Camberwell Guardians	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	Oct. 31
*Erection of School	Chiswick U.D.C.	Lansdell & Harrison, Architects, 65, Basinghall-street, E.C.	do.
*Artificial Stone, Granite Kerbing, &c.	Ince (Lancs) U.D.C.	County Engineer, Guildhall, Westminster	Nov. 1
Water Supply Works, Fairmilehead	Commissioners of H.M. Works, &c.	W. A. Tait, Engineer, 72A, George-street, Edinburgh	do.
*Roadmaking and Sewers, Twickenham	Wimbledon U.D.C.	G. F. Sharpe, 57, Chancery-lane, W.C.	Nov. 2
*Isolation Hospital	Pembroke Guardians	Willink & Thicknesse, 14, Castle-street, Liverpool	Nov. 4
*Heating New School, Vickerstown	Messrs. J. Folliott & Sons	H. T. Fowler, Ramsden-square, Barrow-in-Furness	do.
*Making-up Harold-road	Mr. A. Walker	W. H. Prescott, Engineer, 712, High-road, Tottenham	Nov. 5
*Isolation Hospital, Devizes	Young Women's Christian Assoc.	Bell, Withers, & Meredith, 3, Salters' Hall Court, E.C.	do.
*Receiving House, &c.		A. E. Mullins, Architect, 16, Church-street, Camberwell	Nov. 6
*Isolation Hospital		A. Ramsden, Surveyor, Town Hall, Chiswick	do.
Street Works, &c.		B. Howgate, Council Offices, Ince	Nov. 9
*New Public Offices, Westminster		Secretary, H.M. Office of Works, Storey's Gate, S.W.	Nov. 12
*Additional Settling Tanks, &c.		Engineer, Council Offices, Broadway, Wimbledon	Nov. 20
Infirmary Buildings at Workhouse		E. H. L. Barker, Architect, 146, St. Owen-street, Hereford	No date
Re-building Malthouse, &c., Rollestone-st., Salisbury		J. Harding & Sons, Architects, 58, High-street, Salisbury	do.
Business Premises, Market Hill, Barnsley		G. Moxon, Architect, 26, Church-street, Barnsley	do.
House, Ben Rhydding		H. S. Fleming, Moorlands, Bingley	do.
House, Hereford		W. W. Robinson, Architect, 10, King-street, Hereford	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Inspector of Nuisances	Aylesbury R.D.C.	175*l.*	Oct. 23
*Clerk of Works	Bideford Corporation	2*l.* 10*s.* per week	Oct. 26
*Assistant Surveyor	Lewisham Council	200*l.*	Oct. 28
*Clerk of Works	Walthamstow School Board	3*l.* 10*s.* per week	Oct 30
*Two Temporary Junior Draughtsmen	London County Council	Not stated	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv.* *Contracts, pp. iv. vi. viii. x, & xxiv.* *Public Appointments, pp. xxi. & xxiv.*

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 12 0	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 10 0	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 8 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts	1 14 6	,, ,, ,,
Best Fareham Red	3 11 0	,, ,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire	4 6 6	,, ,, ,,
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 4 0	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime	25 6	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od.		per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath ,,	1 7	,, ,,
Farleigh Down Bath	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,,	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks	2 1½	,, ,,
Red Corsehill ,,	2 5	,, ,,
Red Mansfield ,,	2 4½	,, ,,
Hard York in blocks	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt
,, ,, 6 in. Rubbed Ditto	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt
,, ,, 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, 3-in. do.	1 2½	,, ,,

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep.
,, best seconds ,,	10 15 0	,, ,,
16×8 best ,,	6 2 6	,, ,,
20×10 best blue Portmadoc	10 18 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green	11 2 6	,, ,,
16×8 ,, ,,	6 15 0	,, ,,
20×10 Permanent green	10 0 0	,, ,,
16×8 ,, ,,	5 12 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt
Hip and valley tiles	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,

PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 19 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
½ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard. £ s. d.	£ s. d.
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine— First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1½ in. by 7 in. yellow, planed and matched	0 16 0	1 1 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1½ in. by 7 in. white, planed and matched	0 14 0	0 16 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders ,, ,,	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Flitch Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, to 26 g.	12 10 0	- - -

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 10 0	- - -
Pipe in coils	15 0 0	- - -
Soil Pipe	17 10 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.
,, ,, fourths	2½d.	,, ,,
21 oz. thirds	3½d.	,, ,,
,, ,, fourths	3½d.	,, ,,
26 oz. thirds	5d.	,, ,,
,, ,, fourths	4½d.	,, ,,
32 oz. thirds	6d.	,, ,,
,, ,, fourths	5½d.	,, ,,
Fluted sheet, 15 oz.	3½d.	,, ,,
,, ,, 21 ,,	4½d.	,, ,,
½ Hartley's Rolled Plate	2½d.	,, ,,
⅜ ,, ,, ,,	3½d.	,, ,,
½ ,, ,, ,,	3½d.	,, ,,

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes	0 2 9	per gallon
,, ,, ,, in barrels	0 2 10	,,
,, ,, ,, in drums	0 3 0	,,
Boiled ,, ,, in pipes	0 2 11	,,
,, ,, ,, in barrels	0 3 0	,,
,, ,, ,, in drums	0 3 2	,,
Turpentine, in barrels	0 2 3	,,
,, in drums	0 2 5	,,
Genuine Ground English White Lead	22 0 0	per ton
Red Lead, Dry	22 10 0	,,
Best Linseed Oil Putty	0 9 0	per cwt.
Stockholm Tar	1 10 0	per barrel

VARNISHES, &c.

	per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

B. B. (Below our limit).

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BRIDLINGTON.—For the erection of central schools and caretaker's residence, Oxford-street, for the School Board. Mr. J. Earnshaw, architect, Bridlington :—

J. Rennard	£16,533	19	0
Palframan	15,451	6	9
J. B. Allatt	15,043	11	0
Taylor, Ltd.	14,566	16	0
E. Corner	14,397	0	0
A. Lyon	14,298	0	0
Blackburn & Son	14,095	0	0
Smallwood & Shaw	£13,978	2	0
A. Gardam	13,780	2	0
J. H. Hudson	13,496	5	8
J. Sawdon	13,495	0	0
T. Spink	12,930	1	5
Sampson & Siddall, Bridlington*	12,590	11	11

CHORLTON-CUM-HARDY.—For the erection of Primitive Methodist church. Messrs. Moulds & Porritt, architects, 77, King-street, Manchester. Quantities by the architects :—

Byrom	£2,370	0	
Rowbotham	2,330	6	
Shaw	2,300	0	
Bladon	£2,228	0	
Gerrard*	2,170	0	

DARTFORD.—For fitting-up the kitchen department of the Joyce Green Hospital, near Dartford, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. :—

Main, Ltd.	£2,612	6	0
Clements, Jeakes & Co.	2,200	0	0
Summerscales & Co.	2,145	0	0
Benham & Sons, Ltd.	2,067	10	6
Wenham & Waters, Ltd.	£2,009	0	0
J. & F. May	1,877	0	0
Moorwood, Sons & Co., Ltd., Sheffield*	1,688	0	0

ERITH.—For extensions to Infectious Diseases Hospital, for the Urban District Council. Mr. Harold Hind, Surveyor, District Council Offices, Erith :—

Leather & Sons	£963	0	0
Finnecy & Son	950	0	0
Lightfoot & Ireland	893	0	0
T. Crosse	881	16	9
Portable Building Co., Ltd.	850	0	0
Humphreys, Ltd.	840	0	0
Norton Bros. & Co.	810	0	0
E. C. & J. Keay, Ltd.	801	0	0
Gunning & Sons	£800	0	0
Smith & Co.	773	0	0
Hawkins & Co.	750	0	0
W. Harbrow	720	0	0
G. G. Page	711	0	0
Roberts & Co.	700	0	0
Mitson & Co.	650	0	0
John McManus, Hammersmith, W.*	647	0	0

GEDLING (Notts.)—For the erection of two shops for Mr. C. E. Aslin. Mr. Hedley J. Price, architect, 24, Low-pavement, Nottingham :—

W. & G. Simons	£1,275	0	0
J. G. Short	1,256	0	0
A. E. Smith	1,223	0	0
T. & W. Lee	1,204	0	0
Wm. Maule	1,195	0	0
R. Fisher	1,156	0	0
J. Muscon	1,145	0	0
Pett & Co.	£1,128	13	6
T. Whittaker	1,120	0	0
John Lewin	1,120	0	0
Geo. Sadler	1,092	0	0
T. H. Harper	1,040	0	0
Bellamy & Son, Gedling*	1,030	0	0

GREAT BERKHAMSTED.—For alteration to infirmary, &c., for the Guardians. Mr. Chas. H. Rew, architect, Great Berkhamsted :—

G. Jackson	£1,468	0	
Du Pont & Co.	1,413	0	
J. & J. Goss	1,405	0	
G. & T. Cannon	1,347	0	
Waldon & Co.	1,323	0	
H. Martin	1,318	0	
G. Wiggs	1,306	0	
T. H. Coleman	£1,234	0	
E. Wright	1,212	0	
C. Brightman	1,199	0	
Honour & Son	1,152	0	
H. & J. Matthews, Berkhamsted*	1,110	10	

[Architect's estimate, £1,200.]

HALIFAX.—For the erection of stalls, &c., Borough Markets, for the Corporation. Mr. Jas. Lord, C.E., Town Hall, Halifax :—

J. Turner	£279	4	2
S. Earnshaw	274	14	0
C. J. Norvell	£272	10	0
W. Mitchell*	248	17	4

[All of Halifax.]

NEATH (Wales).—For the erection of a vicarage, Cadoxton-j-Neath, for the Rev. J. D. James. Mr. Geo. E. Halliday, architect, Cardiff. Quantities by Mr. J. W. Rodger, surveyor, 14, High-street, Cardiff :—

W. A. James	£1,697	17	4
W. H. Creighton	1,640	0	0
Thomas & Son	£1,555	0	0
Goodridge & Son, Swansea*	1,460	0	0
C. Gower	1,444	10	0

NOTTINGHAM.—For alterations and additions to form three shops, &c., at the junction of Mansfield-road and Forest-road. Mr. Hedley J. Price, architect, 24, Low-pavement, Nottingham :—

O. T. Fochtmann	£1,132	18	6
G. Baron	1,130	13	3
Hutchinson & Son	1,110	0	0
Scott & Son	1,075	0	0
Green & Son	1,055	9	0
A. E. Smith	1,052	16	0
J. G. Short	£1,047	0	0
T. Cuthbert	1,046	0	0
J. Musson	1,030	0	0
Cooper & Son	1,025	0	0
R. Fisher	1,002	19	0
T. & W. Lee	982	19	0
J. J. Adams*	915	0	0

[All of Nottingham.]

SOUTHEND.—For the erection of banking premises, West Cliff, for the Capital and Counties Banking Company, Limited. Messrs. Greenhalgh & Brockbank, architects, Bank Chambers, Southend :—

Sheffield Bros.	£3,997		
Howard Bros.	3,712		
F. & E. Davey	3,347		
Davis & Leaney, Southend*	£3,267		
W. Stubbs	3,096		

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VOL. LXXXI.—No 3064. OCTOBER 26, 1901.

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The Ideal of the Modern Cathedral.

THE correspondence which has been going on in the *Times* in regard to the proposed Liverpool Cathedral—clenched as it was (we were glad to see) by a really admirable leading article in the same journal—must surely by this time have convinced even the fossil minds of the Liverpool Cathedral Committee that they have made a blunder, and even come near to making themselves a laughing-stock, in their obsolete demand for a copy of a mediæval cathedral, and in the reasons they give for it. It is quite true that the reasoning they employ is only what was in common use half a century ago; it is the reasoning of the Camden Ecclesiological Society resuscitated. But while the artistic world has moved away from that position—has recognised that the Gothic revival, however admirable in its enthusiasm, was mistaken in its practice, and only succeeded in giving us a legacy of sham mediævalism without life or reality in it, the minds of Mr. Robert Gladstone and his colleagues seem to have remained just where the Camden Society was half a century ago. So much so is this the case, that they apparently cannot even understand the existence of any architecture other than imitation; and when Mr. Blomfield exhorts them not to demand an imitation mediæval cathedral, they cannot even understand his argument, and reply in effect—"What, then, are we to imitate?"

It is not worth while to labour this question further in these pages; most of our readers understand the position well enough, at all events, and know what is the meaning of the protest which has been raised against the antiquated proposals of the Liverpool Cathedral Committee. But apart from the mere question of architectural style which affects all important modern buildings equally, there is the question which may be put more particularly with reference to a modern cathedral: What is it we want in such a building, or what ought we to want? What is or should be our ideal in connexion with it?

Nearly all our mediæval cathedrals were originally built as a portion only of a great clerical institution which, though, it has its survivals, no longer exists as a part of our national life or of our national Church. They were each centres of a great monastic establishment, and were built for a worship carried on by the clerics in the choir, and not partaken in by the laity. The long nave was nearly useless except for occasional processions, but its grandeur, and that of the west front, were regarded in the light of an offering, an architectural praise of God; perhaps also as symbolising the power and importance of the special conventual establishment. And the church, the material building, was also a kind of basis or buttress of the conventual plan; the cloister, with the numerous buildings for various offices of the establishment grouped round it, leaning on the church, which usually formed one boundary of its central court.

Now a modern cathedral is nothing of all this. It is not connected with a great religious establishment requiring a train of buildings grouped with it. It is not erected for an exclusive worship carried on by the clerical body on their own behalf. It is mainly a great church, principally built for the worship of the laity, with a service conducted by a limited number of priests, for and in the name of the lay congregation. It will have a chapter house, as the headquarters of the work of the diocese; beyond that, it really requires no subsidiary buildings beyond those vestries or robing-rooms which are needed in all churches. You may choose to build a cloister for the sake of effect—and indeed that secluded green *temenos* with the arcaded walk around it is so charming a feature that it might seem worth while to plan and erect it merely for its own sake; but its practical necessity or utility has gone. And even if all questions of style were put on one side, there is surely in this difference of circumstance and of object a sufficient reason why a modern cathedral should not be modelled on a mediæval one. It is built for a different class of people, for a different object, and for widely different surroundings.

The modern cathedral, then, is simply a great church—the mother church of the diocese, with a special official significance in that sense, but otherwise a church for public worship in the same sense as the parish churches. How should this consideration affect its plan, as compared with that of the mediæval cathedral? For the plan would of course be the first consideration, and here we must be careful to keep clear of the merely utilitarian fallacy. This would lead to the planning of a cathedral on some such lines as those of Queen's Hall, as some recent American churches have actually been planned. This would of course be a fatal idea, for it would be reducing the poetical symbolism of religious worship to a mere plain prose question of seating and hearing. A church, and especially a church on a great scale, is a place for indulging in spiritual aspiration, not merely for seeing or hearing. The necessity for hearing must not be forgotten, but it must not appear to be the main object. But there are two different theories on which the plan may be treated. We may regard the main space of the plan as the church for worship, in which case there must be the possibility of hearing (which to a certain extent limits its size); or we may regard the main space as a place of meditation only, and a place of monuments to the righteous who have departed, and as the vestibule to the actual place of service, which would be restricted to more manageable dimensions. This is actually the case with the mediæval plan; but the mediæval plan, with its character of length without breadth, and its restricted spaces in the choir, is most emphatically not the plan for a worship which has become essentially congregational, not merely priestly. No man asked, without knowledge

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of architectural precedent, to plan a building specially suited to congregational worship, would dream of throwing it into such a form as that of the mediæval cathedral. Congregational worship implies large floor spaces, not narrow avenues.

There is nothing so grand in effect, if we want this idea of floor space, as a circular form; and as acoustics (as before agreed) are only a secondary consideration in a church, there is no practical objection to it except when it becomes so vast that a chanting voice cannot be heard across it. But this question of practicable scale depends on what function we give to the circular space. We may make it the actual worshipping space — the choir; with a vestibule in front of it and a chancel at the farther side; or we may make it occupy the position of the nave—a great domed apartment forming a solemn vestibule to the actual church which opens out of it. On a small scale St. Gereon at Cologne gives a suggestion of this, only that the nave is elliptical instead of circular. There is much to be said in favour of this idea of having the great circular space treated as a vestibule for meditation and for grandeur of effect, planning nevertheless so that it can be seen from the choir, as St. Paul's dome, with its misty lights and shadows, is seen so impressively from the choir. But we should only recommend this plan for a cathedral when it was desired to do something on so great a scale that the domed compartment would be practically too large for the conduct of a service. For any dimensions short of that, nothing can be finer and more appropriately expressive of congregational worship than the circular or Greek cross plan with a dome over it. Only whichever scheme of plan is adopted, the actual service should be contained within one compartment. Have, in other words, either a choir or a nave service, but not both combined. The uncomfortable and rambling effect of this is obvious enough at the St. Paul's services.

We have assumed the adoption of a dome as the great feature of the modern cathedral, because it is the grandest possible form in architecture—capable of far more than has yet been done with it, and is the natural and obvious manner of roofing, in a monumental form, a central area such as we have been regarding as the essential element of the modern cathedral plan. Of the detail of the modern cathedral we say nothing here, because detail is a matter which is settled by other considerations than those of plan and general structure. All that can be said in a general way is that it should be essentially symbolical in character, so far as symbolism can be combined with decorative effect. And as far as such higher forms of decoration as stained glass and mosaic pictures are concerned, they should represent the highest artistic power of the present day, not the stiffness and naïveté of an artificial archaism.

One word of warning in conclusion, to those who think they can have nothing more suitable for a modern cathedral than a revived mediæval one. This is not the place to enter on theological questions, but those who are not blind to the signs of the times cannot but see that if a modern-mediæval cathedral were built now, it will be out of date, as representing the spirit of modern religious worship, long before the present century is out.

TO THE YOUNGER GENERATION:

A FEW WORDS ON THE PRESENT SITUATION.*

By H. Heathcote Statham.

THERE can be no greater compliment than to be asked, on such an occasion as this, to say a few words to the younger generation in regard to the subject which they have chosen for their life's study and principal occupation. For the request seems to imply a belief that one has got something to say that may be of some use to them. I wish I could feel any confidence myself that there is anything I can say that would be a help or a suggestion to my younger brethren. But at all events, I have promised to try; and I have thought it better to write down my remarks, because I wish to avoid generalities and to keep to the consideration of two or three special points in regard to the conditions of modern architecture.

First, then, I would exhort you not to accept the pessimistic views of those who maintain that all architecture is a sham and a worked-out thing now, and that nothing but an entirely new beginning on a new basis can revive it. Architecture is no worse off now than it has been at any time since the Renaissance, as far at least as its higher possibilities are concerned. It is true that it is on a radically different basis since the Renaissance; but we cannot help that. At the Renaissance the world eat of the fruit of the tree of historical and literary knowledge, and nothing can undo the effect of that dose—nothing can now make it possible for us to develop architectural style in the naïve and spontaneous way in which Romanesque and Byzantine and Gothic architecture were developed, except the extinction of all civilised mankind and the obliteration of their architectural monuments, and a fresh growth of society out of barbarism. We cannot wait for that, I am afraid; nor need we desire it. The Renaissance theory of architecture is not so contemptible after all. It might even be argued that it is the higher theory; that we have exchanged the pursuit of architecture as a craft for its pursuit as an intellectual problem. We have unfortunately had nearly a century, the century just passed away, of sheer copyism—revived Greek; revived Mediæval; revived Queen Anne, whose wraith still haunts us to some extent. But we are shaking off this and coming back to the true attitude of Renaissance architecture, which was not mere revival, but an intellectual use and modification of ancient forms. St. Peter's and St. Paul's may take most of their details from antiquity, but for all that they are original architectural creations. What was done then we can do now—and better, for we have developed in these latter days much more power of invention, and much more sense of character in decorative detail, than the men of the Renaissance possessed.

The lamentations made by what may be called the socialist school of critics over the supposed death of architecture are to my mind as unreal as their remedies are unreal. They remind one of the American story of the young man who saw snakes as the effect of over-indulgence in drink, and whose father brought him home a mungoose to kill the snakes: they were imaginary snakes, and (naturally) it was an imaginary mungoose. The critics (I suppose they refuse the name of architects) of the school referred to seem to see imaginary snakes in the path of the modern architect, and their imaginary mungoose—a very imaginary one—is that architecture can only be resuscitated by our throwing over all known architectural styles and details, and by working with our own hands in building. The human mind is not made so that it can do the one, nor the human body so that it can do the other. We cannot by an act of will throw away all the influence of precedent in architecture; and it is physically impossible that the architect can erect the building with his own hands; he must have labourers under him, and tell them what to do; and there we come round in the circle again, and the architect becomes, as he now is, not the craftsman but the overseer. But the snakes, as I have said, are imaginary ones. There is, as a matter of fact, a great deal of bad architecture and bad building (the two terms are to some extent synonymous) going on at present, especially in the streets of our towns, owing to the thoughtless manner in which buildings are run up cheap and in a hurry for merely commercial objects. No good architecture, any more than good building, will ever be done cheaply and in a hurry. But apart from that, there is no real reason why we should not now be producing as good architecture as was produced in the early days of the Renaissance—or better. In other words, architecture is not a dead art unless you choose to make it so.

On the other hand, and in fact just because it is not dead, it does not require galvanising into life. That seems one of the dangers just at present, especially with the more earnest and enthusiastic of the younger generation, who have had it so preached to them that architecture is dead, and that copyism has killed it, that they are all on the *qui vive* to do something original, as they think; something picturesque; something out of the common; even something odd and eccentric, with the idea that they are putting new life into architecture. Hence all kinds of vagaries—short stumpy columns, windows in unexpected places, immense rusticated enclosing half the shaft of a column, and leaving the other half bare: and so on.* These devices do impart what is called "character" to a building, no doubt, as long as they are novel; but one very soon gets tired of them. Dr. Johnson's blunt comment on some of the eccentricities in "Tristram Shandy"—"Nothing odd will do for long," is as applicable in art as in literature. Where I think the real life of modern architecture is to be found is a point we will come to just now. But I am sure it is not in this kind of thing. Eccentricities cease to attract as soon as their novelty is worn off, even with those whom they attract at all. Richardson, the American architect, who was a man of much real originality in his way of treating architecture, got hold of one of these devices for being original—the use of rows of short half-columns as a way of modelling the surface of a pier between

* An address delivered to the members of the Architectural Association School of Design, at the opening meeting of the Session on October 15.

* Perhaps even this is no new thing; human nature does not alter much; and it may be that the sculptor of the lions and column over the gateway at Mycenæ, who has puzzled architectural historians by carving the column with the thicker end at the top, was only a "new movement" artist seeking originality by using columns upside down.

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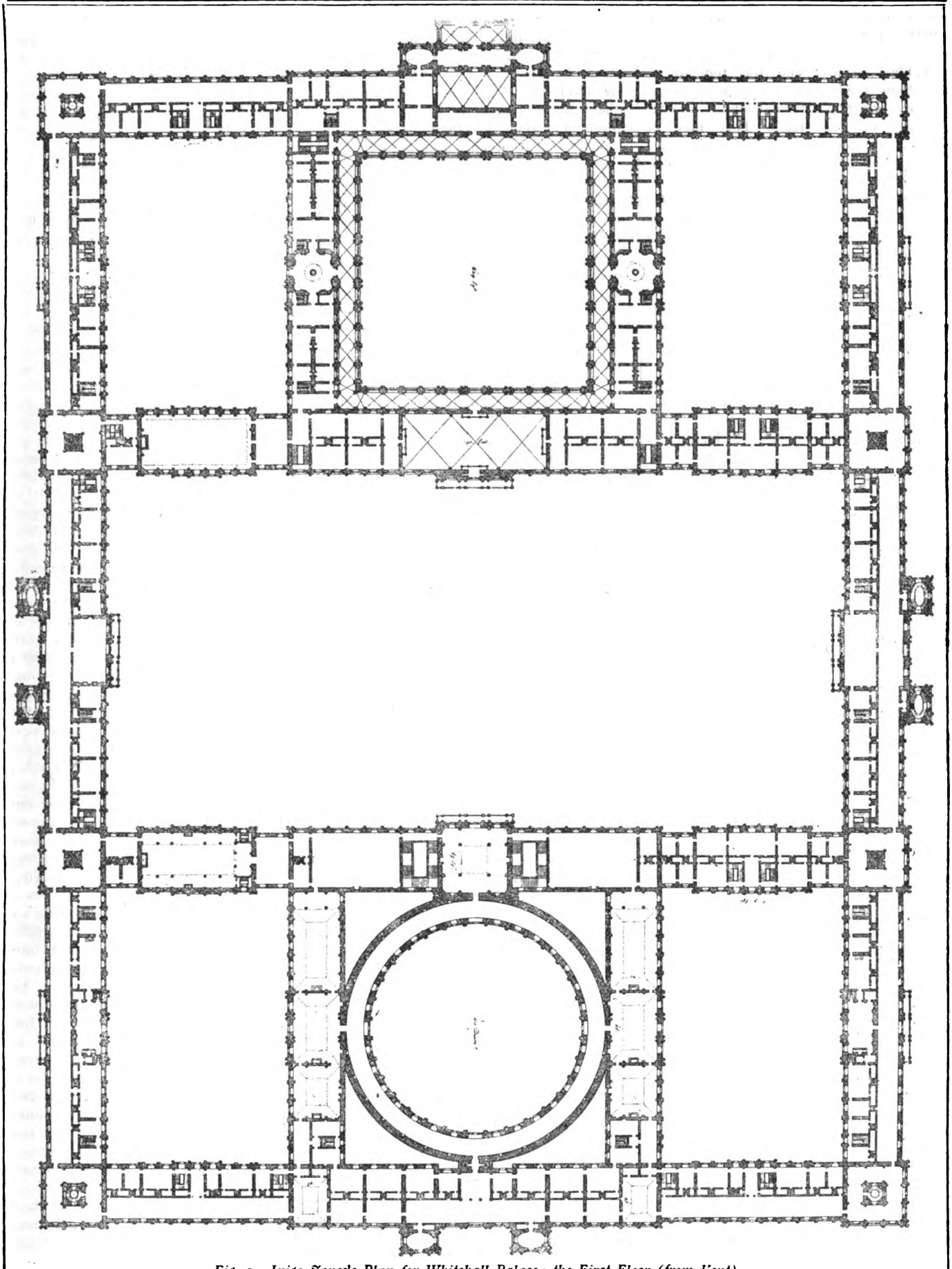

Fig. 1.—Inigo Jones's Plan for Whitehall Palace: the First Floor (from Kent).

windows, &c. It had great acceptance for a time; it became, as one may say, "H. H. Richardson—his mark," and was imitated of many. But where is it gone now? No one imitates it now; he would be rather laughed at if he did. It will be the same with the stumpy columns and exaggerated rustication of recent enthusiasts.

It is possible to be picturesque, no doubt, without being eccentric; but it is a question whether the picturesque is the true object of architectural design. The picturesque, really and truly, will only come unsought; a sought-out and carefully contrived picturesque defeats its designer's ends. At the present time there is a good deal of tendency to aim at the picturesque, especially in house building. This is only one form of what may be called the romantic fallacy in art. Goethe, who was not only one of the greatest poets but one of the greatest critics of the modern era, says:—"In all art, the romantic is the false." That seems a hard saying, and no doubt Goethe did not mean it to be taken too literally; did not mean to say that there could be no interest in romantic forms of art. What he did mean

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was that the romantic in art was not the truest, not the best, not the most lasting. He wanted balance and perfection of form and ideal in art; and the romantic is essentially the irregular, the unbalanced; the exaggeration of something at the expense of the rest. That may be striking at first, but after you have got over the first impression, you feel it to be imperfect. Just the same line is taken by Horace in his celebrated poem on the "Art of Poetry," which contains a great deal of excellent art criticism, for he throughout compares poetry with painting. We do not want anything in a composition, he says, which, however striking in itself, does not belong to the whole; as if a garment, made for the most part of sober-looking materials, had a patch of purple cloth sewn into it where we did not expect such a thing. That "purple patch" has passed into a proverb. If you are a painter, again, he says, you may be particularly clever at painting cypress trees, but that is no excuse for lugging in your cypress tree when you are commissioned to paint a shipwreck: a criticism with a wide application, and as true now as the day it was written.

The bearings of these remarks lie in their application. A good deal of the work which an architect is called on to do in practice has not, unfortunately, much relation to art in its higher or intellectual sense. The whole thing is mixed up with practical requirements, sometimes of a very prosaic order. But when we can get the opportunity to contemplate and treat a building, large or small, as a whole; a building the uses of which are associated with some of the higher objects of our lives—with the repose and sanctity of life, as in the house—the aspiration to higher life, as in the church—the dignity of corporate life (or, shall we say? the dignity which it *should* have) as in a municipal building; in such cases it is the part of the architect to make of his building an embodied idea—a conception which should be whole and complete in itself; a leading idea, pervading first the plan, and expressed with the same completeness in the design. This is where I think that architecture is or can be still a living art. It is all very well for the pessimists to accuse modern architecture of being only a copied architecture, making use of the detail of preceding styles; it is not within the power of man to avoid that, except to a very limited extent. Even before the Renaissance made such a radical change in the situation, the detail in each generation or in even fifty years, depended largely on that of the preceding fifty years. However rapid and striking may seem the changes in mediæval detail, seen through the foreshortened perspective of past time, they were really very slow and very tentative to the men who were contemporary with them. They only went back, of course, to rather immediate precedent, because that was all that could occupy their attention when there was no history, little or no travel, no books, and no photographs. We have got all styles of detail thrown open to us, and we cannot escape their effect on our minds; and any man who were to resolve, on carrying out a large building, "I will have all new detail of my own invention," would either find it impossible, after all, to escape from precedent, or if he did, he would probably invent a good deal of very bad detail, doing it worse than his forefathers for the mere sake of doing it differently; simply because it is not in the power of one mind to invent new forms to that extent. It is this rather crazy endeavour to invent something entirely new which is at the bottom of what is called "l'Art Nouveau" in furniture design, in which everything is to look as if made out of ribbons and telegraph-wires; it *is* new, but as it is abominably ugly and for the most part unstructural in character, I fail to see what we have gained by it.

But it is in our power to make a new building a new conception in plan and design, with a dominant idea governing the whole. Now it is in regard to this unity of design, this prevalence of a dominant idea in the building, originating from the plan and expressed throughout the design, that there is too often failure in these days as compared with the days of the Renaissance. We see large modern mansions, for instance, which are supposed to be picturesque, in which the plan is all a ramble without a dominant motive, and the external appearance that of a house which has been added to at different times with no regard to the relation of the additions to the existing portions; and perhaps a couple of half-timbered gables thrust into a building all the rest of which is solid masonry, to make it look still more irregular and (I suppose) "picturesque." That is Horace's "purple patch" in architectural form. I do not call that architecture; I call it throwing a house together, not designing it.

Now it is in this matter of unity and completeness of idea in architecture that I think we get a valuable lesson from some of the Renaissance architects. A great deal of attention has been drawn to their work lately by several fine illustrative publications; among others by Mr. Belcher and Mr. Macartney's book on what they call the "Later Renaissance," but which I think should be called the Renaissance proper, and Mr. Triggs's collection of illustrations of the works of Inigo Jones. And what strikes one in the works of Inigo Jones and Wren especially, as compared with most modern work, is the manner in which they grasped the conception of a building as a whole, and subordinated everything else to a central idea. Every church of Wren's, for instance, is a distinct conception with a dominant idea of its own. The details they used were to a great extent borrowed (though Jones put some originality into his), and the decorative details, in Wren's buildings at all events, are often not good, and perhaps he was not really much responsible for them; but their general conception of a building was nearly always fine and always complete and consistent with itself; an architectural whole. No English architect since them seems to me to have had quite the same power of grasping a design as a whole except Sir Charles Barry, whose detail also we may not care for now, but whose conceptions were always truly architectural in their breadth and comprehensiveness. In the Houses of Parliament he used (by official order) Tudor detail; that in itself is all copyism, of course; but the conception as a whole is quite new and original, and all based upon a grand and yet perfectly simple idea in the plan.

As a further example of this unity of treatment of a building on a great scale, take the plan of Inigo Jones's intended Whitehall Palace. As a plan for a palace this is one of the grandest conceptions we know of; and observe what a simplicity and unity there is about it; the one great court in the centre; the symmetrical blocks on each side, each with its own smaller courts; the dignity gained by the centralisation of all the leading points of the plan; and the remarkable conception of the varied treatment of the two side courts, the one square, the other circular; but a variety which is kept quite subordinate to the main symmetry of the plan, and is not allowed to disturb it in the least. And what is the significance of this variety? The square court is in the nature of a cloister, for communication; the circular court is to give dignity and a special character to the State approach to the royal presence. There has hardly ever been a finer and more original idea in architecture than this of making the state access to the sovereign not an ordinary straight gallery, but a sweep round a great semi-circular colonnade. It is a real piece of poetry in architectural conception. It is true that the particular monarch in question was not worth such an approach; but that is a matter of detail which does not affect the architectural conception. The example which we have as to the architectural detail with which this palace would have been carried out, in the Banqueting House in Whitehall, though very refined as a treatment of Classic material, may be thought a somewhat cold and academical architectural clothing to have been carried out all over a vast palace such as this was meant to be. I think so myself; but even the academical detail could not destroy the greatness of such an architectural conception; nothing could kill that plan. And in the very fact that it was never carried out it serves to illustrate another point touched upon before. The pessimist critics deny that architecture is anything but building, and are always dinning into us that drawing is not architecture. It is not; but it is a means of showing and putting on record an architectural conception. An idea in architecture is an idea, whether carried into execution or not; and Inigo Jones stands before us as a greater architect than he would otherwise have appeared, in virtue of this one great conception, never built, but fortunately at least existing on paper to excite, as it ought, our admiration and emulation. I do not think there could be a better answer to the nonsense that is talked nowadays about architecture being only building, and properly the work of the craftsman. No mere craftsman could have risen to such a conception as the Whitehall Palace.

As to the use of the detail of a past style there are those, and some of them able and earnest architects, who would have us think that to stand by historical detail is a necessary condition of what they call "continuity" in architecture. It is not an indefensible position; it may at all events be better to have good detail that is old than bad detail that is new. But probably the wiser course, and the one that is most in accordance with the actual tendency of architecture in the past, is not to throw overboard the historical detail, but to regard it as a basis for gradual development and modification, little by little, as we find

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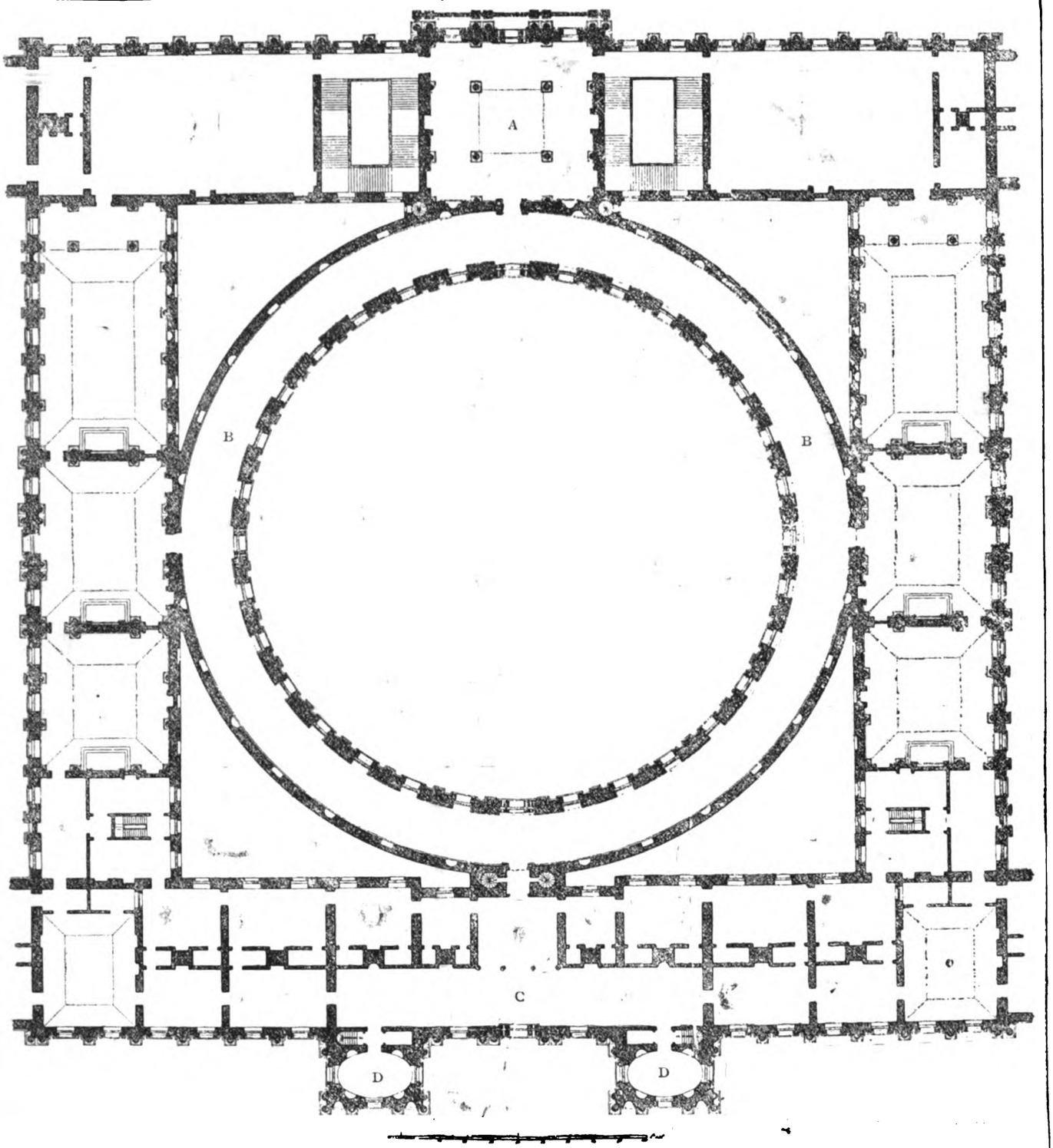

Fig. 2.—Part of the Whitehall Plan to a Larger Scale.

A. Grand Vestibule. B B. Circular Gallery forming approach to the Presence Chamber. C. Ante-room or Grand Gallery. D D. The King's Private Rooms.

opportunity; which is the way in which all the changes of style in the pre-Renaissance period really came about. They were not the result of sharp and sudden and wilful change, but of gradual modification. At the present moment there is a great leaning towards classic types in architecture, and something more may be developed out of this; but we must get rid of the idea of merely imitating the manner of Queen Anne or Jacobean detail, and try to develop it so as to give a new interest to it. We cannot do this all at once; and it is dangerous to try to break away from it violently for the sake of what is called originality. But that is not of so much consequence as is sometimes supposed. Refinement in detail, of whatever type, is indeed of the greatest importance; it is in the difference between refined and coarse detail that the hand of the artist is shown. But the particular type of detail employed is a secondary matter. The essential quality of great architecture lies in the main conception of plan and design as a whole. You might hack off all the imitation Tudor detail from the Houses of Parliament and case it all with imitation Classic detail; it would still remain a great building, and its main characteristics as such would remain unaltered.

To come from these very great and exceptional buildings to more ordinary and average erections, I would still suggest that the real object of architec ure as an art is to make a building the expression of some distinct and leading idea. So-called picturesque houses and cottages are often only picturesque by association, as it were; by recalling the features and characteristics of some older buildings. In Ibsen's "Master-Builder" (the title of which ought to be "The Architect," for that is its real meaning in the original) there is an effort made to hurry Mr. Solness on behalf of a young couple who are anxious to have their house without delay. "Yes, yes," he replies, "we know all that! And so they're content to take whatever's offered them. They get a—a roof over their heads—an address—but nothing to call a home. No thank you! In that case, let them apply to some one else!" Solness's reply embodies the truth. Even an ordinary small dwelling-house may exemplify this; may have its idea. There is an interesting house at Hampstead figured in Mr. Belcher's book, which exemplifies both the existence of a distinct idea and the failure to carry it through entirely. From the plan (fig. 3) you see that the man who

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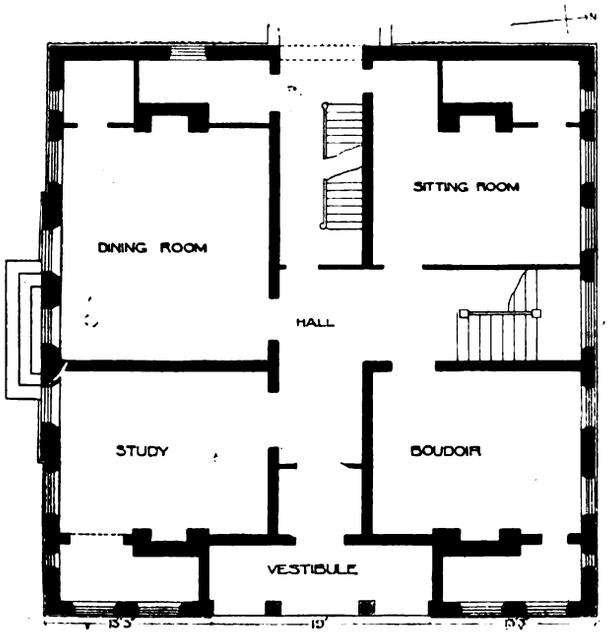

Fig. 3.

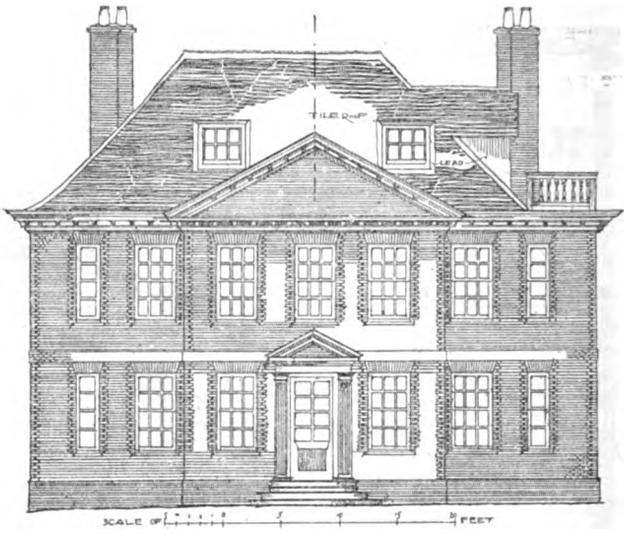

Fig. 4.

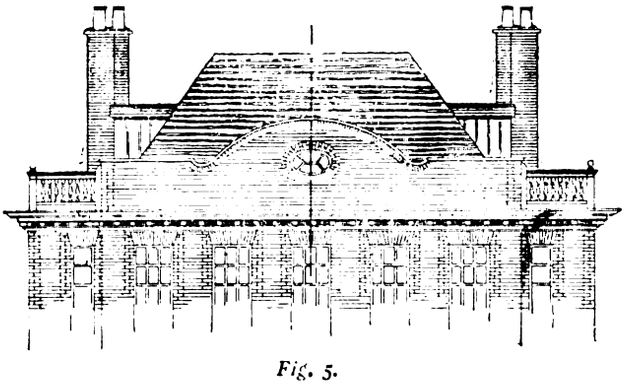

Fig. 5.

planned that house had a very good and original idea, which gives a special interest to it. He kept the chimneys inside, thereby keeping them away from the cold, and made their position the excuse or occasion for most pleasant little ante-rooms or bays out of the principal rooms. It is really a charming idea for a plan of a small house. But he failed to carry it out completely in the design. At the front of the house the treatment of the plan is recognised, at the back it is not, and the chimneys are left to come crudely through a slope of roof (fig. 4). That is an object-lesson as to the desirability of carrying out an idea thoroughly when you have one. The architect of that house just missed making a complete thing of it. The roof is put on anyhow, and out of centre with the gable; and the projection and gable on the side elevation have no relation to anything in the plan. If it had been treated in some such way as that suggested in fig. 5, the design would have been centralised and would have correctly expressed the plan.

And that reminds us of another point worth mention, viz., not to scruple to find fault with an old building because it is old. There is a weak tendency among modern architects to admire everything in an old building, instead of considering it on its merits as they would a modern building. Then the next thing to this blind admiration is blind imitation. The designers of old buildings were subject to human error like ourselves; and a study of them critically, considering what are their merits and what are their mistakes, is far more useful to our minds than accepting everything as right because it is old.

Two other reflections I would add before concluding; the first I fear an unpalatable one. It is this: not to be sure that you are right in architecture and everybody else is wrong. There is a tendency to this among architects, partly arising, perhaps, from the fact that our aims at present are rather uncertain and conflicting. It is a pity, for it is remarked on by outsiders, and gives a handle against the profession. More than once I have heard the observation—"Oh, we know that architects never admire one another's works." And I confess I have been unpleasantly struck sometimes by hearing a quite young man, who has done nothing but make sketches and prize designs, speak with the most sovereign and sweeping contempt of an eminent architect who has carried out buildings which his youthful critic probably could not even have planned, much less carried out: and this for no better reason, apparently, than that the eminent architect's notion of detail does not suit him. As has been well observed, "We are none of us infallible, not even the youngest"; and it would surely be fitting for youthful critics to consider the work of their eminent seniors at least in a merciful spirit, remembering that—as a Trinity College man said of the members of the smaller Cambridge Colleges—"They, too, are God's creatures."

The other observation I have to make is less disagreeable, and perhaps unnecessary here: it is, to make perfection in architecture for its own sake an object, and not for what you can get out of it. But I think that sentiment will meet with plenty of sympathy here. What has drawn me to the Architectural Association has been the feeling that at your meetings there is really a desire to promote the best study of architecture as an object worth trouble in itself. You do not here waste time and try each others' tempers by wretched wrangles about the wording of by-laws, and who ought to have votes and who ought not, and so on; matters which might be settled in five minutes by sensible people with no axes to grind, and which have truly little enough to do with "the advancement of architecture." And if those who make the love of the art rather than the desire of gain their first object—if they must be content to see others richer than themselves in bankers' balances, they have the compensation of keeping their youthfulness of spirit and their appreciation of the beauty of life. There is nothing, I believe, that ages a man's soul like money-getting, considered as a principal object; nothing that keeps the mind and the heart young like the love of Nature and of Art for their own sake; and I put the love of Nature first; for interesting and fascinating as Art is, there is something wrong about an artist who cares for Art more than for Nature. As Wordsworth has beautifully said:—

> "Nature never did betray
> The heart that loved her; 'tis her privilege,
> Through all the years of this our life, to lead
> From joy to joy; for she can so inform
> The mind that is within us, so impress
> With quietness and beauty, and so feed
> With lofty thoughts, that neither evil tongues,
> Rash judgments, nor the sneers of selfish men,
> Nor greetings where no kindness is, nor all
> The dreary intercourse of daily life,
> Shall e'er prevail against us, or disturb
> Our cheerful faith that all which we behold
> Is full of blessings."

I can wish those who are young and are beginning life nothing better than that they should live to realise the truth of those words.

NOTES.

Technical Education.

Sir Henry Roscoe's address at the Technical Institute last week was more hopeful than have been the recent utterances of most educational experts. He thinks that the country has made up its mind to a reconstruction of the educational system, and that at any rate a complete system of secondary and technical education on the lines of the Government Bill of last Session may be

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expected. Perhaps this Administration may manage to carry this measure, but we confess that in the present state of politics we are not very sanguine. But if, as Sir Henry Roscoe points out, it appears feasible to carry out one portion of a new system, it is better to do so than to risk everything by attempting to load the legislative machine too heavily. More and more, in our opinion, it becomes clearer that for the purposes of technical education concentration is necessary. A great deal of money is at this moment being wasted all over England in the winter technical classes which have just begun. They are too much of an amateur character, too much mere winter pastimes which are not followed up. It is absolutely useless for young men to attend carpentry classes in some small country town one evening a week and then cease to do so when spring arrives, and afterwards trouble no more about the subject. One or two may be able to make a rabbit-hutch or a pigeon-house in consequence of these classes, but this is not technical education, and it is no exaggeration to say this is the kind of thing which in many places is now labelled as technical education.

Appeals under the Workmen's Compensation Act.

THE opening this week of the Law Courts again directs attention to the state of the appeals under the Workmen's Compensation Act. When the Courts began work on Thursday there were on the list fifty-five cases awaiting decision, as nearly as possible one-eighth of the entire number of appeals to be dealt with by the two Courts of Appeal. It is obvious, as we have already pointed out, that unless the decision of the appeals under the Workmen's Compensation Act is to fall into a chronically backward state, some special effort must be made by the authorities to deal with these appeals. The resignation of his office by the late Master of the Rolls now places as President of the Common Law Appeal Court another Judge, and, as new brooms always sweep clean, it may be that the outlook is more hopeful than it was before the commencement of the last legal vacation. We have no expectation that the Lord Chancellor will move a finger to improve the state of business, but it may be that if the Judges of the Court of Appeal can be made to understand the need for dealing with these appeals quickly, something may be done. The subject is one which the various trade organisations should take up in the interests of workmen generally, since many of these appeals are, when decided, important and governing precedents on the working of the Statute.

The Parkes' Museum.

WE cordially support and echo the protest made by Dr. Winter Blyth, in his speech at the Sanitary Institute dinner, in regard to the inadequate housing of the Parkes' Museum; an institution which as he says, is of national importance, and is constantly visited by strangers from other countries, Americans especially. Yet it is "very difficult to find," and when found is in a building cramped in regard to space and totally without distinction of character. As Dr. Blyth says, if there were a hygienic museum of such importance in Paris or any other continental city, it would be a beautiful building with a marble staircase and sculptures. It is much to be regretted that, in a country which has led the world in sanitary reform, our chief sanitary museum should be housed in such a way as to convey the impression that the nation, or the Government, are entirely indifferent on the subject.

Electric Lighting in Stoke Newington.

THE tendency of modern electrical engineering seems to be to make large central generating stations, and hence the question that is at present being considered by many Local Authorities is whether they should manufacture the supply themselves or get it from other sources "in bulk," and then retail it through their own distributing mains. Colonel Crompton, in his report on the electric lighting of Stoke Newington, discusses this question at length. The Hackney Borough Council have offered to supply electricity to Stoke Newington at a price per unit less than that at which any London company has been able to produce it for themselves. The prices quoted by Hackney are 2s. 6d. per unit for a small supply, with rebates down to 2·45d. per unit for a large supply. The Hackney Council and their able engineer, Mr. Hammond, are to be congratulated on being in a position to make this offer. Colonel Crompton gives figures which prove that, so long as the output in Stoke Newington is less than a million units per annum, it would certainly be more profitable to buy their electricity from Hackney than to manufacture it for themselves. He points out that getting the supply in bulk not only leads to considerable economies in management expenses, but also greatly reduces the capital expenditure required. The Hackney Borough Council only propose a seven years' agreement, so if at the end of that time it should seem advisable, there is nothing to prevent the Stoke Newington authorities from laying down works for themselves. Colonel Crompton also discusses the question of the "free wiring" of workmen's houses and houses held on very short tenancies, to which class most of the houses in the district belong. In Hackney the Council have entered into an agreement with the National Electric Wiring Company, under which, if the consumer wishes it, the Wiring Company will provide and fix the wires and fittings for the electric light, the consumer paying the Council a rental charge of 5½d. per lamp per quarter in addition to the meter bill. Colonel Crompton, however, points out that if a litigious consumer refused to pay this rental it would be extremely difficult for the Council or the Wiring Company to force him to pay, as the wires remain the property of the Company.

A Defective Railway System.

A SINGULAR accident occurred on the Great Western Railway at Leamington early on Sunday morning. It was due, in the first instance, to the failure of the telegraphic communication, which rendered it impossible to work the traffic by the block system. Now, the rules of railway companies make very elaborate provision for the regulation of traffic during a temporary breakdown of this nature; and whether the rules were adhered to or not in this case, is a point for the Government Inspector to clear up. According to the reports of the accident, trains were permitted to enter a section "at stated intervals," and a train which had thus been allowed to proceed towards Leamington, and had been brought to a standstill a short distance from the station, was run into by another train which had been subsequently passed into the same section. A great deal of damage was done, many waggons being completely wrecked. As they were "only" goods trains, and no personal injury ensued except to an unfortunate goods guard, the papers, of course, dismiss the occurrence in a few lines. Had a passenger train dashed into the wreckage, there would have been a different tale to tell, and it is a matter for congratulation that this did not happen. But the "time interval" system can hardly be regarded as a satisfactory one; there is a suggestion of uncertainty and insecurity about it which this occurrence goes to justify. Either the system or the officials were evidently at fault, and it is, to say the least, somewhat disquieting.

Beaufort-buildings and the Strand.

A BEGINNING has been made of the clearance of this site with the demolition of some premises on the east side of Beaufort-buildings. It is stated that the extensive alterations proposed to be effected by the Worcester Buildings Company conjointly with the Westminster City Council comprise the removal of Nos. 89-104, Strand, the closing of Herbert's-passage at the back, the widening of Beaufort-buildings, and the setting back of the building line so as to widen that portion of the Strand to 80 ft. Towards the cost of the last-named improvement the London County Council have agreed to contribute 50,000*l.* Amongst the premises thus marked for demolition is the large house, No. 96, Strand, at the corner east of Beaufort-buildings (a well known perfumer's shop), which was built in 1826 after J. B. Papworth's designs, and was occupied by Rudolph Ackermann. Papworth also built, in 1812, the large room at No. 101, Strand, for Ackermann, who had there revived the drawing school originally established by William Shipley, a co-founder of the Society of Arts. "Simpson's," Nos. 101-3, formerly Ries's Grand Divan, has replaced the old Fountain tavern, famed for its political club, which adjoined the premises of Charles Lilly, the perfumer and snuff-dealer, familiar to readers of Steele's papers in the *Tatler*. Lilly removed thence, after a fire, to the site of No. 96, where he kept Mr. Bickerstaff's Court of Honour. Beaufort-buildings marks the site of the town "inn" or mansion of the Bishops of Carlisle which at the Reformation was bestowed by Henry VIII. upon John Russell, first Earl of Bedford. Francis, the second earl, quitted it for a house he built on the north side of the Strand. The property then passed to Edward, second Marquis of Worcester, author of the "Century of Inventions" (1663) as tenant-in-tail. He let it for a while, at an annual rent of 500*l.*, to Lord Clarendon, whose daughter was there married, in the night of September 3, 1660, to James, Duke of York. The third Marquis of Worcester, advanced Duke of Beaufort, let the ground for building purposes, reserving for himself at the south end the site of a small town house, which a fire consumed in 1695. Nos. 91-2, "Upton's Salisbury" tavern and dining-rooms, between Carting, formerly Dirty, lane and Beaufort-buildings, was rebuilt ten years ago after Mr. Edward Clark's designs.

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The Prince of Wales's Theatre, Tottenham-st.

THE old playhouse in Tottenham-street, Tottenham Court-road, together with three freehold houses in Pitt-street, in the rear, was offered for sale at the Mart last week, but the property was withdrawn after a bid of 9,600*l.* The house was originally built in 1780 for musical entertainments for Francis Pasquali, and was enlarged, as the King's Concert Room, by Novosielski, who there gave his concerts of ancient music under the frequent patronage of George III. and Queen Charlotte. Having been styled in turn as the Amphitheatre (1808, for Saunders's equestrian troupe), the Tottenham-street, the Regency, the Royalty, and the West London (1823), and vulgarly known during some portion of its not always successful career as the "Dust Hole," it was leased as the Queen's in 1835 by Mrs. Nesbitt and her coadjutor, Mme. Celeste. Mme. Celeste (Mrs. Elliott) had there made her *début* before a London audience four years before; a programme of January, 1831, mentions the "act-drop" as painted and presented by Clarkson Stanfield. The name of the house was afterwards changed to that of the Fitzroy, and again to the Queen's. A change of fortune came, however, in 1865, when, under the management of Miss Marie Wilton (Lady Bancroft), the Prince of Wales's Theatre at once became one of the most favourite and fashionable theatres in London.

Metalwork for Capetown.

ORDINARY household metal wares are, as a rule, distinguished for dull insipidity, owing to the methods of their production and to the abrasive process, which removes from their surface all signs of life and feeling that tool-marks or interesting workmanship can give. Mr. Montague Fordham has just completed an order for metalwork for Government House, Capetown, which is remarkably free of the stamp of the machine. Nor are these productions copies of styles of a more or less remote period. They are the work of various craftsmen; two handsome beaten brass flower-bowls from Mr. Nelson Dawson's workshop; a pair of ecclesiastical-looking brass candlesticks by Mr. H. Wilson, simple, and certainly well designed; also a pair of copper candlesticks by Mr. Rathbone; coal-scuttles and scoops and incised brass flower stands by Mr. Nelson Dawson, the latter from designs by Miss Worthington, together with a number of large metal flower-bowls by the Birmingham Guild of Handicraft. We are used to seeing large quantities of old metalwork and furniture going to the Colonies, where such things are specially valued as the work of our forefathers; but it is encouraging to notice that modern handicraft is also in demand.

ADDITIONS TO BATHS, LEEDS.—A Russian bath, recently added by the Leeds Corporation Baths Committee to the baths at Union-street, was recently opened. The accommodation includes hot room, warm lavatories, shampooing-room, cooling-room, and dressing-boxes for fifty persons. The new arrangement occupies the space formerly taken up by the first-class swimming-bath. The temperature in the hot room ranges from 105 deg. to 110 deg. Fahr., and is obtained by injecting showers of steam. Mr. W. S. Braithwaite, of Leeds, is the architect.

CHURCH, PRESTON, BRIGHTON.—The foundation-stone of the new church of St. John the Evangelist, at Preston, Brighton, was laid by the Bishop of Chichester on the 16th inst. It is intended to accommodate nearly 500 people, and the estimated cost is 5,480*l.*, excluding seating, lighting, and heating. This church was one of the last designed by the late Sir A. Blomfield.

THE SANITARY INSTITUTE.

THE Conference on Water Supply which was held during two days last week under the auspices of the Sanitary Institute may be considered to have been mainly occupied with the consideration of the control of the sources of water supply. Mr. J. Parry opened with a paper on "The Protection of Watersheds," and the number of Bills which had been passed to enable authorities to purchase catchment areas in order to prevent fouling of water was to find its way into reservoirs for domestic use; and his conclusion was that if water supplies are to be efficiently protected against risks of pollution which would be injurious to health, the entire area over which rain is collected must be in the hands of the authority responsible for the waterworks. His remark that "these drainage areas need not necessarily be left barren and uncultivated" seems to show that he recognised the existence of a difficulty for which he hardly suggested a remedy. Cultivation to any remunerative extent can hardly be carried on without involving pollution; and the difficulty of keeping large areas of land out of any use except as a cup to collect water seems likely to be an increasing one. Dr. Seaton, Medical Officer to the Surrey County Council, dealt with the protection of water against waste and against local contamination. The latter is a much simpler matter to deal with than the contamination of the source of supply, since the responsibility for contamination can in almost all cases be brought home to individuals, who can be compelled to abate or discontinue it. In regard to waste he described the steps taken by the Surrey County Council to resist encroachments on local resources in order to provide water for London, and also to adjust the claims of different localities within the county. This point, however, hardly comes under the head of "waste" so much as under that of misappropriation. Mr. Clayton Beadle, who followed with a third paper, went into the subject of underground pumping and its effect in depleting wells and streams which had been locally relied on for water supply or for mechanical power. He instanced the effect of the pumping by the Kent Water Co. on the neighbourhood of Orpington and Crayford, especially the drying up of the Cray and the consequent loss of power to the paper mills. Many of our readers will remember the strong complaints made by large manufacturers in Hertfordshire who found their underground water surreptitiously pumped away from them to supply London. This subject was much dwelt upon in the course of discussion which followed. Mr. Castle, of Garfield (Yorkshire), described the serious effects on the underground water of the sinking of a mine in a previously agricultural district, which drained wells on which the neighbourhood depended, while in the mine the water which they were wanting aboveground was actually being pumped to waste. Mr. Siddalls, from Tiverton, spoke also strongly in favour of the claims of rural districts, as against cities at a distance, to the water on their own land. In his district they said, "Dartmoor for Devon," and thought that local wants should be supplied before water was taken out of a district. The latter principle is quite right; but "Dartmoor for Devon," if acted upon at all beyond the limit of merely securing the necessary water for local use in the first instance, would represent a dog-in-the-manger policy. A wild district like Dartmoor seems appointed by Nature as a gathering-ground for a great water supply, the ground existing under circumstances which almost preclude any serious contamination.

The present position of the London water supply was touched upon by two speakers. Mr. Burgess, the Chairman of the Liverpool Water Committee, referring to the fact that in many villages and towns contamination of water went on to a great extent, said that where a considerable population lived on the banks of a river it could never be regarded as a satisfactory source of water supply, and that the position of London in this respect was not only a menace to the population of London, but was made an excuse or example for laxity in other places. The same line was taken by Mr. F. Verney, L.C.C., who spoke of the difficulties which the London County Council had to contend with in endeavouring to secure the proper efficiency and purity of the water supply. The filtration of the London water was magnificent, but they ought not to have to depend on that for their health. There is, however, hardly any possible natural water supply which would not need filtration before use, so that argument must not be pushed too far. The speaker went on to suggest that the late Mr. Bateman's scheme for water from Wales was the right one and that no nearer source would be satisfactory, but Mr. Verney is probably mistaken in the belief that an adequate supply for London can be obtained entirely and solely from Wales. The question of London water supply was, however, after this speech ruled out by the Chairman (Professor Robinson) as involving matter of too controversial a nature.

Dr. H. R. Mill, in a paper on "Rainfall and Population in England and Wales in Relation to Water Supplies," maintained (what we have always maintained) that nature gives an ample supply of water for these islands for all possible needs, and that it is "not the water we use but the water we waste" that gives cause for anxiety. But Dr. Miller's notion of economising water consists, like that of almost all water engineers and water experts, in trying to make the users do with as little as possible, and in a rigid supervision of fittings. That is beginning at the wrong end, and putting the less before the greater. What escapes from bad fittings is a mere trifle compared with the enormous mass of rain-water which runs to waste every year through want of any systematic provision on a large scale for storing it. If that is undertaken properly, the question of the dribbles from fittings will be found to be a very secondary one, nor would there be any occasion to try to stint the use of water to householders. All water policies based on trying to reduce the amount of water used in households are thereby condemned at the outset. We do not use too much water but too little; what we ask from County Councils and water engineers is to get us more, not to try to restrict the use of what we have.

At the second meeting, on Thursday last week, Mr. W. Whitaker took the chair, and Professor Robinson, who had presided on the previous day, commenced the proceedings with a paper in which a kind of summary of the present position and recent progress of opinion in regard to the relation of rivers to water supply. We quote the following from the summary given in the *Times* report:—

"The author referred to the change of opinion which had taken place with regard to impounding reservoirs and the sedimentation of suspended matter brought down in flood-water. The Balfour Commission in 1892 expressed the opinion that flood-water was 'highly objectionable and undesirable,' whereas the recent report by Lord Llandaff's Commission stated that 'no restriction need be placed on taking flood-waters.' He thought the latter opinion would be acted upon with regard to the metropolis and would also furnish a solution of the problem of providing for the requirements of our towns, which even now is a pressing question in many places, and will be more acute as years go on. The Rivers Pollution Act of 1876 had not secured the general purification of our rivers, but something had been done in cases where special Parliamentary powers had been granted to authorities. He thought that in dealing with manufacturing effluents a certain amount of elasticity must be given in enforcing rules and standards of purity, and that cases must be carefully considered to avoid applying a rigid standard of purity under totally different circumstances. With regard to effluents from sewage outfalls, recent experience had enabled many of the difficulties to be solved, as the last few years had brought into shape remedies which were not previously available. He regarded the utilisation of bacteria in anaerobic or aerobic chambers as the solution of many existing troubles. The breaking up of organic matter by anaerobes enabled the resultant liquid to be utilised on land for agricultural purposes with greater advantage than in the crude state, and where sufficient or suitable land was not available the further treatment of the liquid in aerobic beds enabled any required standard of effluent to be attained. The application of sewage to land must be governed by sanitary, agricultural, and economic considerations. Each case should be considered on its merits, as it was seldom that two were alike."

It will be observed that the first portion of the remarks here summarised, in regard to utilisation and storing of the flood waters of rivers, is in direct opposition to the views for the most part laid down in the preceding day's discussion. The fact we take to be that the impounding of flood water from rivers is open to objection and constitutes a danger, which may however be reduced to very small proportions by adequate filtration; and that on the other hand, while admitting it to be a danger

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and open to objection as regards the *quality* of water we want, it is not easy to see how we are to dispense with it when we come to consider the question of the *quantity* required. Mr. A. G. Leigh, in a paper on "The Control of Weirs and Dams on Streams in Relation to Water Supply," took up a subject which has an immediate connexion with that of river pollution, for if a river be polluted, *a fortiori* a dam will be, seeing that it forms a temporary block where all foreign matter in a stream, of a solid kind at least, is checked and collected. When dams are situated on streams the dry-weather flow of which consists almost entirely of manufacturers' and sewage effluents, one cannot be surprised that they become harbours of filth. They may, however, be turned to advantage in this sense, inasmuch as they afford at least an opportunity of intercepting and collecting matter which ought not to be in the river, and which it might be difficult to collect from the stream. If neglected, on the other hand, they only become an additional means for fouling the stream below them. What was required, Mr. Leigh said, was "a staff of river scavengers under the direction of the rivers authority, who would begin at the source of a stream and work downwards, removing all unnatural obstructions and abandoned weirs and dams, and flushing and cleansing out the stream."

The paper by Mr. H. W. Russell (Berkshire County Council) on the "Prevention of Pollution within the Thames Watershed," contained nothing new, and only stated over again the difficulties under which the Thames Conservancy find themselves in endeavouring to prevent pollution without acting oppressively towards small rural corporations or towards individual owners. He pointed out that it was a real grievance that small and poor communities should be heavily taxed for drainage schemes beyond their own requirements, "because they happen to be situated within the drainage area which supplies London with water." It is a grievance from the point of view of the small community, no doubt; but as long as we go on drinking Thames water, every possible check upon pollution must be rigidly enforced; one is sorry for the small community, but we are bound to consider the larger one first. The importance of this campaign against river pollution was opportunely enforced by the paper by Mr. Caink, the City Engineer of Worcester, with regard to the proved relation between typhoid and the state of the river at that city. Up to 1894 the river Severn, from which the water supply was derived, was polluted, and the annual rate of typhoid cases was 150 per 100,000 of population. In that year the filtration was improved, and the typhoid rate fell to 38. We must not pass without notice another significant and rather surprising fact brought forward by Mr. Caink, viz., that the typhoid statistics were lower in the towns supplied with filtered river water than in those supplied from artesian wells and from mountains. This fact, if authentic, certainly seems to tell against those who are inclined to be alarmists about the mere fact of taking drinking water from the Thames at all.

WATER SUPPLY FITTINGS EXHIBITION.

In connexion with the Conference, a well-arranged and interesting exhibition of fittings and materials more or less connected with this subject was opened during part of last week in St. Andrew's Hall, Newman-street.

A good many of the exhibits were of course well-known apparatus or materials. We had Polarite and Pasteur filters; the Maignen water-softening apparatus and the Desrumeaux water-softener and purifier; a large exhibit of the Sanitary Lead-lining Company's goods; illustrations of installations of the Septic Tank Syndicate; Messrs. Callender's bitumen sheeting for damp-courses and lining reservoirs ponds &c. At one stand were exhibited some of the apparatus used by the Sanitary Institute in their recent tests of extract ventilators and injectors.

Messrs. John Jones, Jennings, Doulton, Shanks, and Bolding, all exhibited samples of some of their best work, the general excellence of which is well known. Among things that are worth special mention is Messrs. Shanks's "aqua-jet" flushing cistern, which does away with all mechanical means for starting the siphon; a small pipe is carried about 18 in. down from the bottom of the cistern, opening into it just below the opening of the siphon; at the foot of this pipe is a compressible rubber ball, looking something like the globe at the foot of a thermometer tube; the action of a small lever compresses the ball and sets up a jet upwards in the tube, which impinges on the orifice of the siphon and starts it. This does away with some part of the mechanism in the flushing cistern, and looks as if it ought to be a method of certainty of action, which, as we all know, is not always the case in siphon-flushing cisterns. They also show a lavatory basin with a siphonic waste, the object of which is to exercise a force to draw the water out in the case of a tap being left running, on the ground that even a much larger water-way than the supply tap will not prevent a basin overflowing, in consequence of the water entering at pressure from the main, and therefore faster than the escaping water. We have known this to be actually the case in a lavatory basin which had an apparently adequate overflow; but it is a simpler remedy to enlarge the relative area of the overflow-pipe than to insert this siphon waste, an awkward-looking object standing up at the back of the basin, which has of course to be specially shaped for it. The flushing cistern just mentioned should be less noisy than those that are more filled with mechanical gearing; but the "Sanitary Appliances Syndicate (Grundy's patents)" have gone a step further with a flushing cistern on a new principle, which really is "noiseless," and is the only one we have seen that properly merits the name. This cistern is empty until it is charged for immediate use by pressure on the seat; the water is then admitted to it by the turn of a two-way valve on the main, and rises in the cistern till stopped by a conical metal float or buoy which fits into a rubber seating in a circular opening in the top of the cistern preventing the further escape of the air and consequently preventing the water from rising quite to the top of the cistern. The water discharges to the closet below simply by a direct down-pipe from the bottom of the cistern, with a perforated bell projected into the cistern which allows of an after-flush to keep the basin charged. As there is none of the drive which a siphon gives to the flush, it is obvious that the cistern must be at a certain height above the basin to get a sufficient head for a good flush; in most cases this could be done; at all events the cistern is practically "noiseless," a claim made in many other cases and not realised. Messrs. Doulton's exhibit showed admirably the beautiful working and fitting up of their "Claybury" self-closing non-concussive valve, for hospital and asylum water fittings, and also their non-concussive bath fittings, in which supply and waste are combined in one metal chamber placed outside the bath, on decorative brackets, so as to be always available for examination. Mr. Jennings had also a fine exhibit of somewhat similar appliances in the way of non-percussive valves and taps, showing also admirable finish. Messrs. Bolding exhibited some very good specimens of their "Laydas" siphonic-action closets, which have the advantage also of a great depth of water in the pan, and also some very good taps with a seating of their special material, "Boldite." They also exhibited a closet with a water-waste preventing valve on the service pipe, in lieu of the flushing cistern.

Among other things we may mention were Messrs. Townson & Mercer's fitted boxes of water analysis sets for the use of sanitary officials; Mr. George Kent's exhibit of water-meters; Greenway's sand-washing machine; Mr. Yardley's patent grooved and tongued pipe joint, which admits of a pipe being lifted for inspection or repair without disturbing the adjoining ones—this is ingeniously contrived, but we do not feel convinced of the joint being quite tight under pressure; Mr. Thomas Feather's bevelled ring for facilitating the junction of pipes at a slight angle, where a bend would not be necessary—this is an admirable contrivance and one wonders it has not been thought of before; the A. P Smith Manufacturing Company's *matériel* for water service, especially their tapping machine, for making connexions to water mains under pressure; and Messrs. Tucker & Sons' fire and hard-pressed bricks for engineering purposes.

Both the exhibition and the catalogue were very well arranged.

THE ANNUAL DINNER.

The annual dinner of the Sanitary Institute took place on Thursday, the 17th inst., at the Holborn Restaurant. Sir Francis Sharp Powell, Bart., M.P., presided, and among those present were Sir W. H. Broadbent, Sir William Church, the Mayor of Dover, the Mayor of West Ham, Mr. A. Winter Blyth, Dr. A. Newsholme, Dr. S. Cathcart, Dr. J. C. Thresh, Dr. H. R. Kenwood, Dr. Louis C. Parkes, Dr. A. W. Harris, Dr. G. Reid, Dr. C. Childs, Major R. H. Firth, Mr. T. Blashill, Mr. R. E. Middleton, Mr. T. W. Cutler, Mr. H. D. Searles-Wood, Mr. J. Osborne Smith, Mr. H. H. Collins, and Mr. E. White Wallis.

"The King" was proposed by the chairman, which was followed by "The Queen, the Duke and Duchess of Cornwall and York, and the other Members of the Royal Family," also submitted by Sir Francis Sharp Powell, M.P.

Mr. T. Blashill then proposed "The Municipal Corporations." He said there were many gentlemen gathered together on this occasion who were connected with municipal bodies, which, although not having the duties of State cast upon them, carried out the equally important duties of the preservation of the health and life of individuals of the community. It was not necessary to dilate upon the importance of those duties; this Institute, which was founded to help these corporations in every possible way, and was carrying out this intention thoroughly, was well aware of it. The assisting of municipal bodies was a very important part of the work of the Institute. It helped them largely by the holding annually of great congresses in different parts of the country, at which a very large number of delegates—some 1,200—from the corporations were sent to take part in the discussion of sanitary problems. The Institute also assisted them by holding examinations to test the merits and capacities of the persons who were candidates for positions under them. He desired to couple with the toast the Mayors of Dover and West Ham. Probably never before were these two municipalities coupled together. They were so widely different, the one so ancient, and the other so modern that little more than fifty years ago it was but a rural village. The corporations of this country, he concluded, were doing their duty, and they were alive to the necessity of sanitation, not altogether irrespective of cost, perhaps, but without undue regard to the amount of the rates.

The Mayor of Dover in responding mentioned that the corporation of which he was the head possessed its own waterworks, electric trams, and would soon have its own electric light. He considered that every corporation should be the proprietor of these undertakings, and it was certain that they would achieve a good deal more than at present if there was not quite so much red tapeism on the part of the Government and the Local Government Board. Whilst there should be some check upon corporations who might be inclined to extravagance, yet obstacles should not be placed in the way of schemes which were absolutely necessary for the good of boroughs.

The Mayor of West Ham also replied.

The Chairman, in proposing "The Duke of Cambridge (President) and the Sanitary Institute," said that for many years H.R.H. with characteristic kindness had occupied the chair at these annual dinners, but this being the year of mourning in Royal circle he had asked to be allowed to remain absent on this occasion. He (the Chairman) could not introduce the Sanitary Institute without in the first place expressing his deep regret in the loss they had sustained by the death of Mr. Rogers Field, whose presence on the Council was very frequent, and whose advice was always valuable, as his gifts were never ceasing. He had them in mind in his latest hour, as was shown by his liberal bequest of 5,000*l*. With regard to the Institute itself, it had become in one sense old—so many were the societies springing up around it—but although it was old in years it was constantly renewing its life. There never was a time when it was doing more excellent work. During the last year there were no less than seventy meetings, attended by 25,000 persons, and there had been more than 200 new applications for membership and association. They were proud of their past, they rejoiced in their present, and were determined that their future would surpass both. It was, indeed, a happy thought that drew together in one association those who were now gathered together under the auspices of the Sanitary Institute. There were those who were most eminent in the medical profession, those who were most skilled in engineering, and those

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who were most acquainted with all the multifarious details of sanitary appliances. They all worked together in comradeship, without jealousy, and with one desire animating them all—how best to serve the great cause in which and for which they laboured. It was the great privilege of those who took part in their work, in a measure and to an extent, to at once guide public opinion and to exercise control over administration. There were some who sought to guide public opinion, who through their want of experience had become in the course of a few years wearisome pedants, and there were others who studied the practical side so much that they were constantly falling into errors from want of that scientific precision which was eminently necessary in order to carry out with good result any practical experiment. They guided public opinion and public opinion made laws, and laws which were made without public opinion had no validity. This was more especially applicable to laws affecting public health, which did and must affect every event in the daily life of the people. They were not content to possess knowledge, because knowledge locked up in their intellectual treasury was, for the present at least, vain and useless; but having gained that knowledge, they distributed it day by day by teaching the people to practise that which they so diligently and perseveringly brought to their notice. They had achieved a great deal. He had watched during many years the cause of public health both in Parliament and in the provinces, and he had seen how they had dispersed that terrible acquiescence in evil surroundings which paralysed all efforts and was fatal to progress. Wherever they went they found an increasing interest and a more marked readiness to co-operate with those sanitary reformers who desired to carry their healing message to the homes of the people. Whether one went into the crowded city or town, or into the village, there was to be found a readiness to learn and also a willingness to practise. There was one subject in their minds—that relating to the Parkes Museum, which he would refer to. He regarded this museum as not only of national, but of European, importance; its good effects were not confined to this country. There were some imitations of it in foreign lands; in Vienna there was a museum constituted on much the same principles, and he had reason to know that it had conferred great benefits upon Eastern Europe. They had the Parkes Museum as an inheritance, and were not content that it should remain in its present condition. They felt that the institution was not worthy of the name it bore or the object which it had to accomplish. He admired the courage of the active members of the Council of the Institute in moving to provide a place in London fitting to discharge the functions of that museum. The Council estimated the amount required as 25,000*l.*, and he hoped that sum would soon be placed in their hands by the generosity of an appreciative population. He desired to say, also, a few words with regard to the housing question. This problem had occupied their time during an important conference a few months ago. It had become a popular and almost a fashionable cry. He regarded this stage as most dangerous and one likely to lead to results of a disastrous character. He feared the demon of exaggeration. If they performed the achievement of travelling to any outside part of the country with eyes open upon the scenery, they would be impressed with the multitude of new houses which were springing up through every part of the most prolonged journey. He believed that the problem of the housing of the people was in many places now solved or about to be solved. In the Borough of Wigan—the town he represented—it was the opinion of the housing authorities that they had the solution of that problem entirely at their command. There had also been an enormous extension of dwellings for the people in Bradford owing to private enterprise. If they, in an hour of enthusiasm, built houses beyond the requirements—those houses necessarily involving a great expense—there would be a reaction which would be most harmful to their cause. There could be no doubt that in London, Liverpool, Manchester, and other such towns there was great reason for the movement, but he hoped that it would be made with discretion. With regard to the question of river pollution, they were making substantial progress, as in many other departments of their works, and he hoped the time was not far distant when the working classes, who were really their masters in these things, will take action so as to preserve themselves from contamination by foul streams and to relieve themselves from the evil of smoke. When the working man was convinced that his family were injured by the pollution of the stream and of the air, it would not be long before an effectual remedy was supplied.

Dr. A. Winter Blyth, in response, said the Institute had now been established for a quarter of a century, and he claimed that that was managed in the best way possible in the interests of the members and the community generally. Its council was composed of professional men most interested in hygiene—those men most adapted to further the aims of the Institute. Its members included not only medical officers of health, but well-known architects and famous engineers. They worked very hard indeed; during the last year, for instance, they had attended 125 meetings, which represented 700 individual attendances. There was nothing to gain personally in this work; it was all unselfish, self-denying labour. The examination of inspectors was a most important work because unless there were men properly qualified to carry out the details of this profession no sanitary advance was possible, but this was only a small part of the work of the Institute. Congresses were held from time to time attended by delegates from many large towns, and questions of vast importance were discussed. The conference on the housing of the working classes already referred to, was largely attended and certain very important conclusions were arrived at. They were not local in any sense or form but imperial in their influence. This assertion was not extravagant because they had already a branch in Australia, one in Canada, and negotiations were in progress for the formation of another in India. They wished to be world-wide because hygiene itself was a national and imperial matter. They had popularised it, but at the same time they had not neglected its technical aspect. With regard to their museum which was bequeathed by Dr. Parkes, the first professor of hygiene in this country, they wished to provide a better structure. It was visited by all the English speaking race, particularly by Americans; and it was very difficult to find. The building was not worthy of the British nation—if the museum was in Paris or some other Continental city, it would have a beautiful piece of architecture with a marble staircase and sculptured statues. They felt ashamed of the building and considered they should be housed in something more worthy of this great subject, which was so important to all the English speaking race. They knew very well that in warfare far more soldiers died from disease than at the hands of the enemy. In the present war more died from typhoid than from the sniping of the Boers, and that being so it was most important that a great institution which studied hygiene should be suitably housed and recognised by the nation. He was sorry to say that they had not yet received any funds from the Government, but they lived in hope. They had already made a commencement with regard to the building fund. If he had been asked to say the sum required for a proper building he would have put it at half-a-million, and some towns would spend more than that upon a building of a much less worthy and useful object than this. They were more modest, and put the cost at 75,000*l.* At the present time they had received subscriptions amounting to about 7,000*l.*, which included 158*l.* from the President of the Council and Vice-Presidents, 95*l.* from the members of the Council. No doubt they would receive considerable support from the provinces. The great towns which were doing such grand municipal work were indebted to this institute, because the principles that they had put in practice had been taught in theory for many years in the institute. Their various exhibits had been of great educational value, and chairmen and public health committees, medical officers, and sanitary inspectors could always find something new in their museum—something which would prove useful to them. A report of a committee, of which the late Mr. Rogers Field was the last member, had recently been published upon ventilation. Mr. Field had spent over 2,000*l.* and a good deal of the leisure of his life upon this committee, and the report was very valuable. Altogether, the institute was doing valuable work, and was worthy of support.

Dr. A. Newsholme proposed "The Guests," mentioning Sir Wm. Broadbent and Sir Wm. Church in particular. With regard to medical officers he said that Local Authorities should see that they obtained the best men by paying the best salary, and there should be some security of tenure. Sanitary science, he added, had attacked the water supply, the drainage question, &c., and now the house decorator must be made to keep the houses clean. This was a very important matter, as cleanliness in houses was a great factor in the prevention of disease.

Sir Wm. Church replied, and a toast to the Chairman concluded the proceedings.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The first meeting of the Discussion Section of the Architectural Association for the session was held on Friday, the 18th inst., at 56, Great Marlborough-street, W., at 7.30 p.m.

Mr. R. H. Weymouth, the Chairman of the section, presided, and was supported by the secretaries, Messrs. J. H. Pearson and H. Gregory Collins.

Several questions having been asked by members and replied to, the Chairman called upon Mr. H. Gregory Collins to read his paper entitled "Stables and Stable Fittings," which we print in full on another page, and which was illustrated by drawings of various stables actually carried out in different parts of the world. The discussion was opened by Mr. G. H. Smith (who proposed a vote of thanks to Mr. Collins) and carried on by Mr. C. H. Brodie (who seconded the vote of thanks). Mr. Brodie pointed out the value of a paper of this kind, where so many facts had been gathered which were of the utmost value to the architect who had to design buildings of this sort. The following gentlemen also took part in the discussion:—Messrs. Watson, Geoffrey Lucas, Jacob, and Taylor.

The meeting was particularly fortunate in having Mr. Pye Smith, of the St. Pancras Ironwork Company, present, who was kind enough to come down and give them some valuable information on stable fittings which had been gathered over an experience of a quarter of a century. Mr. Smith heartily supported the vote of thanks, and said although Mr. Collins was a young man, the paper they had listened so attentively to that evening was a most exhaustive one, and showed that he had given great attention to the subject.

There were further good things in store when the Special Visitor of the evening—Mr. Arnold Mitchell—proceeded to sum up the discussion in a speech in which he gave the members the benefit of his experience in many works which he had recently carried out.

Mr. Mitchell emphasised the value of designing separate stables for the various classes of horses in first-class stables. A proper system of ventilation was most essential, and he agreed with the author of the paper that the open channel method of drainage was the right thing. Glazed wall tiles should not be used, but a dull green tile manufactured by Messrs. Powell was satisfactory. He advocated the use of double-hung sashes in stables with the deep bottom bead.

The Chairman included in the vote of thanks to the author the names of Mr. Pye Smith and Mr. Arnold Mitchell, also Mr. Burdett-Coutts, M.P., and Messrs. Musgrave & Co. for kindly lending drawings, which was passed unanimously.

Mr. Gregory Collins having replied, the meeting terminated, and it was announced that the next meeting would be held on November 8 next, when Mr. W. E. Davis will read paper on "The Finishing of a Dwelling-House," and Mr. Walter Millard has kindly promised to attend as Special Visitor.

Theatre, North Shields.—The New Central Hall of Varieties, North Shields, has recently been opened. It has a frontage in Saville-street of 54 ft. On the ground floor are the exits to the theatre, a shop, and a buffet. On the first story is the theatre, which comprises a large hall with a tier over. The former is divided into pit and stalls, and the tier is divided into first and second circles. Accommodation is provided for about 1,000 people. The lighting throughout is electric, supplemented by gas, and the installation was carried out by the Northern Electric Engineering Co. Messrs. Hope & Maxwell, of North Shields, were the architects, and Mr. T. Robson, of the same town, the contractor.

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A MODEL BUILDING TRADES' SCHOOL.

In a Report furnished to the British Government on the technical, agricultural, industrial, commercial, and art schools of Würtemburg by Dr. Frederick Rose, his Majesty's Consul at Stuttgar , some interesting particulars are supplied respecting the Royal Building Trades' School, which is described as the most important institution in Würtemberg for secondary technical education. Of the 23 similar schools in Germany, some of which are upon a much smaller scale, it is the most flourishing and important. This was evidently recognised by the authorities of the South Kensington Museum, who, after having inspected the school, invited its participation at the Health Exhibition held in London in 1884. At this Exhibition the school was awarded two diplomas, one for a series of scientific school work, and the other for the organisation of its curriculum. About seventy years ago there were in Würtemberg no cheap facilities for the further education of skilled building workmen except the costly method of taking lessons from private teachers, foremen, or architects. This disadvantage was also keenly experienced by those who wished to devote themselves solely to technical professions or to become subaltern technical State officials, and who were consequently compelled to limit their studies or to visit technical schools in France or Austria-Hungary. For these reasons the Stuttgart Trades' School was founded in 1832, following the example of the technical education institutions which were founded in Germany at Karlsruhe (1825), Munich (1827), and Dresden (1828), and of the polytechnic schools founded in Austria-Hungary at Prague (1806) and Vienna (1815). In 1840 the trades' school was raised to the level of a polytechnic school, but, as in course of time it became evident that—owing to the peculiar conditions then prevailing—the curricula for primary and secondary technical education could not exist together in one institution, a new building trades' school was founded in 1845 for secondary technical education and entirely separated from the Polytechnic School, which was converted later into the Technical High School, and devoted exclusively to primary technical education.

For a period of twenty years, until 1864, the school was only opened in the winter months, as the majority of the pupils were engaged in practical building works during the summer months, and was for this reason generally known as the Winter Building Trades School. During this time the school had made such rapid progress, and proved itself of such great importance, that in 1865 summer classes were opened, the whole school placed under the immediate supervision of the Ministry of Education with the designation "Royal Building Trades School," and a special building erected at a total cost of 30,000*l*. In 1900 two new wings were added to the original building at a cost of 12,000*l*. The special aim of the school is the partially theoretical and thoroughly practical training of technical engineers, architects, surveyors, &c., including (*a*) Practical master builders (technical architects) of different degrees; (*b*) Subaltern building inspection officials for State, district, and municipal positions; (*c*) Hydraulic engineers for canal and dam construction, erection of mills, regulation of rivers, &c.; (*d*) Mechanical engineers, managers of mechanical workshops and factories,, and foremen and draughtsmen; (*e*) Government surveyors and agricultural engineers (qualified surveyors who have attended further courses in irrigation and drainage).

The school is managed by a director and by a professorial committee, consisting of a limited number of the principal professors; this serves as an advisory board to the general professorial council (Konvent) which includes the whole of the teaching staff. This council decides, within certain limits, all important questions affecting the school, and is required to lay proposals before the Minister of Education regarding those matters which are not within its competence. The director of the school is appointed in permanence and not from year to year as at the technical high school. The organisation of the school is particular, and differs greatly from that of the technical high school and other technical schools, inasmuch as its curriculum provides facilities in the lower classes for the general and mathematical preliminary education necessary for the commencement of studies in the technical branches of the upper classes. The school consists of three special departments for (*a*) architects; (*b*) engineers; (*c*) surveyors and agricultural engineers. These three departments rest upon a common foundation, which consists of one general and two mathematical preparatory classes. Classes with too many pupils are split up into parallel classes with exactly the same professors, subjects, and duration of teaching, as it is not considered advisable to allow, as a rule, more than thirty pupils in one class. The summer and winter terms contain 100 days each, and the remaining days are free. The longest holiday period is from the beginning of August until the latter half of October, the Easter and Christmas holidays being very short. This arrangement has been devised in order to enable the pupils of all classes to devote themselves to practical work during the summer holidays. Many of the poorer pupils earn enough during the summer holidays or summer term to keep them during the winter term. The professorial staff consists of twenty-five principal or ordinary professors, and nineteen extraordinary professors and assistants.

The general technical instruction afforded by the school is assisted and supplemented by:—1. Excursions for purposes of inspection of practical work to works, factories, buildings, and various places; duration of the same, two hours, half a day, or two to eight days. The expenses for travelling are defrayed by the school. 2. Competition in the upper classes for prizes given for the best building designs; public exhibition of competitors' work. 3. Annual public exhibition of all work done by pupils during the year. 4. Permanent exhibition of the best work done by pupils of the school. 5. School library, valued at 5,000*l*. 6. Collections for instruction in architecture, mathematics, construction, mechanical and electrical engineering, chemistry, physics, surveying, freehand drawing, painting in water-colours and oil, models, &c., valued at 3,000*l*.

The number of pupils during last winter term was 823. During the summer term there were only 679, the diminution being caused by the large number of building pupils engaged in practical work during the summer, in addition to the holidays. The age of the pupils varies greatly. For instance, in the winter term there were 475 between the ages of 14 and 20, 259 between 20 and 25, 76 between 25 and 30, and 13 above 30. The lowest age was 14½; the highest, 34½; the average, 20. The large number of pupils between 20 and 25 is a very significant fact. As it may be safely assumed that a very large percentage of these pupils support themselves, their attendance shows what great value they attach to their further education. Of great interest also is an analysis of the occupations of the 823 pupils, as follows:—

Certificated master builders and aquatic engineers	16
Masons and stone hewers	376
Carpenters	137
No handiwork	68
Mechanics and metal workers	147
Surveyors and agricultural engineers	51
Other occupations (joiners, sculptors, modellers, &c.)	27

It has already been mentioned that a special feature of the Royal Building Trades' School is the position of the various technical departments upon a common basis, consisting of one general preparatory and two mathematical preparatory classes. After pupils have passed through these they commence the study of their special technical branches in the upper technical classes. Intending pupils for all classes, preparatory and technical, must either show that they have already passed through school courses enabling them to participate fully in the subjects taught, or they are required to pass an entrance examination in order to prove their educational qualifications. Pupils for Class III. must be at least seventeen years old, for Class IV. at least eighteen, for Class V. at least nineteen, and for Class VI. at least twenty. Experience in practical work is not required for the general and mathematical preparatory classes, but is absolutely necessary, however, for further study in the upper classes in which the special technical instruction commences. The minimum limits of necessary practical work for commencement of studies in practical courses have been fixed as follows: Building department, one year; mechanical engineering, one and a half to two years; surveying, two years. By this means all the pupils of the technical departments, commencing with Class III., are in possession of a sound general mathematical and practical education, with experience in drawing, before beginning their special studies in the technical departments. The total time necessary for the completion of studies is—without taking into account the periods of practical work—in the building and constructive engineering department (counting from preparatory classes), eight terms (four years); machine engineering, six terms; surveying (counting from Class I.), six terms. The fees are upon an extremely moderate scale, and amount to about 2*l*. per term, or 4*l*. per annum; they are partially or wholly dispensed with in the case of talented or industrious pupils who can produce officially-attested papers certifying to their indigent circumstances. There are also a number of small scholarships, of which his Majesty King William II. contributes twenty, and the Freemasons' Lodge three; they are each worth about 5*l*. per annum. The great majority of the pupils live in extremely moderate circumstances; the following estimate, which is the result of a number of careful inquiries, will give an approximate idea of the individual student's annual expenditure.

	£	s.	d.
Fees for two terms	4	10	0
Drawing materials, books, &c.	3	10	0
Combined bed and sitting room and board for two terms	27	10	0
Coals, light, and service	3	10	0
Miscellaneous	11	0	0
Total	£50	0	0

During the summer holidays—about three months—they either reside with their parents or relations or earn salaries by practical building, engineering, or surveying work, or as draughtsmen. Pupils of the upper classes add to their incomes by giving lessons in mathematics and technical subjects to backward pupils of the lower classes. At the end of each term the best pupils of each class receive prizes worth from 15s. to 1*l*. 15s., the second best receive diplomas, and the third best honourable mentions. After passing through the full courses the final examinations for the following diplomas are held:—

1. State diploma for building and architecture.
2. School diploma for building and architecture.
3. Diploma for hydraulic engineering.
4. School diploma for mechanical engineering.
5. State diploma for surveying.
6. State diploma for surveying and agricultural engineering.

In the last financial year the total expenditure was 10,721*l*. and the income from fees 2,781*l*., the deficit of 7,940*l*. being covered by the State. Dr. Rose, after giving these and other details, affirms that of all the German schools for secondary education which are known to him from personal inspection and experience, the Stuttgart Building Trades' School undoubtedly occupies the first rank with regard to (1) preliminary mathematical, practical, and drawing education of the pupils; (2) excellence of the instruction in the upper classes in mathematics, constructive drawing, and practical technical instruction; (3) quality of the professorial staff which is, beyond dispute, one of the best of its kind at similar institutes in the German Empire; and (4) importance of the private and public positions held in Würtemberg, Germany, and foreign countries by former pupils of the school.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this body was held at Spring-gardens on Tuesday, Mr. A. M. Torrance presiding.

Loans.—The following loans were granted to local bodies:—20,000*l*. to Shoreditch Borough Council for purchase of land; 8,000*l*. and 7,360*l*. to Camberwell Borough Council for paving works; 20,000*l*. and 5,000*l*. to Hackney Borough Council for electric light installation and meters; 6,380*l*. to St. Pancras Borough Council for street lighting; 7,480*l*. and 2,810*l*. to Hampstead Borough Council for electric light installation and meters; 2,900*l*. to Kensington Borough Council for paving works; 200,000*l*. to London School Board for schools, &c.

London Fogs.—The General Purposes Committee reported that they had had under consideration a letter from the secretary of the Meteorological Office stating that it was proposed to hold an inquiry into the occurrence and distribution of fogs in the London district, and their relation to other atmospheric and

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local conditions, and asking for the co-operation and assistance of the Council in the conduct of the inquiry. The Meteorological Council make the suggestion consequent on applications which have been received from the electric supply department of one of the Local Authorities and from some of the electric supply companies of London for special forecasts or warnings of the approach of fogs, and on account of the general importance of the subject to the inhabitants of London.

The mode of procedure suggested by the Meteorological Office was the initiation of a special inquiry during the winter months into the conditions associated with the development and distribution of fog in London and its vicinity; and for that purpose (1) to obtain records from properly selected positions in various parts of London; (2) to collate these records with the general atmospheric conditions at the time of the observations as shown by the information regularly furnished to the office; and (3) as far as possible to ascertain the character of the information requisite for anticipating the occurrence of fogs in particular localities. The Committee recommended the Council to concur in the suggestion that it should assist in the initiation of a special inquiry, on the understanding that all responsibility for the conduct of such investigation do rest with the Meteorological Council, and that, subject to the passing of the annual maintenance vote, the Council contribute in the next financial year a sum of 250*l.* for the investigation. This was adopted.

Fire Alarm Posts.—The Fire Brigade Committee reported that the provision of fire alarm posts of 5 ft. 6 in. instead of 4 ft. 6 in. had to some extent prevented the misuse of the apparatus, and the Council resolved to lease for ten years posts of the new pattern from the Post Office.

Breaking up of Thoroughfares.—The Highways Committee reported upon the result of the conference with the City Corporation on the question of breaking-up of London thoroughfares by companies and others, and now submitted the following recommendation:—

"That the Corporation of the City of London and the Councils of the respective Metropolitan Boroughs and of the City of Westminster be asked whether they will be prepared to support the London County Council in making a representation to his Majesty's Government as to the necessity for legislation to confer upon the Council, as the central authority for London, powers to make by-laws or regulations, and to enforce compliance therewith, as to the manner in which companies and others who have, for the purpose of executing works in connexion with their respective undertakings, statutory rights to break open the public thoroughfares, shall exercise such rights, and as to the time at which such works shall be commenced, and the period within which they shall be completed, and the surface of the roads re-instated."

This was agreed to.

Photographs of Old London.—The Historical Records and Buildings Committee reported that, through the kindness of Mr. Cohen, they recently obtained facilities for having photographs taken of certain paintings belonging to Mr. H. Bischoffsheim, of The Warren House, Stanmore. The pictures, which were recently on exhibition at the Whitechapel Art Gallery, are by well-known artists, and represent places of interest in London in the latter part of the eighteenth century. Mr. Bischoffsheim had now had the photographs enlarged and had generously presented a set to the Council. Their value is increased by the fact that only twelve copies of each picture were taken, the plates having then been sent to Mr. Bischoffsheim to be destroyed.

Totterdown Fields Building Schemes.—The Housing of the Working Classes Committee reported in reference to the vote of 74,093*l.* passed in July for the erection of 276 cottages at Totterdown Fields, Tooting. They invited tenders for the erection of three rows of cottages on Section A, and recommended the acceptance of that sent in by Messrs. C. B. Roberts & Co., amounting to 11,184*l.* This was adopted.

Sewage Disposal.—The Main Drainage Committee recommended that the estimate of 500*l.* in respect to the proposed alterations to the pumps at the North Woolwich Pumping Station be approved, and that the offer of Mr. John Cochrane to supply and fix the requisite new parts for 441*l.* be accepted. The Committee explained that the quantity of sewage to be pumped was far in excess of what was anticipated when the engines and pumps were put down.

Tramway Extensions, &c.—The Highways Committee presented a report on the several improvements and widening of streets required in the Metropolis in connexion with tramway proposals. The cost reached the total of 1,093,652*l.*

Illustrations.

MUNICIPAL BUILDINGS, GLASGOW.

THIS is a view of the late Mr. Young's celebrated building at Glasgow, taken from a new point of view, showing the elevation to John-street, looking towards George-square.

It is reproduced from a large and very fine washed monochrome drawing which was exhibited at the last Royal Academy.

HOUSE AT CHISLEHURST.

THIS house, the drawing of which was in the last Royal Academy Exhibition, is designed by Mr. Ernest Newton, in his usual essentially home-like style.

The materials are red bricks and red tiles. The builders were Messrs. Willett, of London.

SCULPTURE PANELS, PARES'S BANK, LEICESTER.

THESE two panels, which form part of the decoration of Pares's Bank, Leicester (Messrs. Everard & Pick, architects), illustrated in our issue of September 21, are 10 ft. by 5 ft. in dimension, and are executed in Portland stone.

In that entitled "Commerce," the central figure represents Commerce with her offspring, Peace and Enlightenment; to her left are figures suggesting the Hemispheres, east and west, bringing foodstuffs and raw materials; on her right are introduced British crafts and manufactures, to whom Commerce offers the horn of plenty.

The panel entitled "Agriculture" shows in the centre Agriculture crowned with wheat and accompanied by two children playing pastoral music; the other figures typify the corn harvest, sheep-raising, fruit-growing, and dairy-farming.

Mr. C. J. Allen, of University College, Liverpool, is the sculptor.

STABLES AND STABLE FITTINGS.*

THE question of the keep and management of horses is so intimately associated with the daily work of many of us that, although it is scarcely the professional side of the subject, I feel that I need offer no further apology in asking for an exchange of opinion on some points to which I have given my attention.

I shall endeavour in the few remarks I am going to make to speak only of those matters that will possess an interest for all of us who may be called upon to build stables, and here I may mention that I would take as a type the professional man's horse and stable, as it is more likely to come within our province to deal with our medical man before we have the good fortune to design stabling for a mansion or the buildings for a stud farm.

No one would, of course, buy a horse that he knew to be unsound, and I do not propose to enter into what constitutes unsoundness, but I would advise any one who thinks of purchasing a horse to get him examined by a veterinary surgeon whose opinion he can rely on, and tell him to give his especial attention to the horse's feet, for here, I believe, a source of evil is often overlooked, and no horse with faulty feet can stand much hard work on the roads.

I will now pass on to say a few words about the place where the horse is kept, and I propose to discuss the site and construction of the buildings by and by under the detailed headings of this paper, as these questions must be studied minutely by those who are fortunate enough to build stables, and I want to insist upon the necessity of thorough and efficient ventilation and proper drainage in stables where it is expected to keep horses healthy.

The horse is possessed of very capacious lungs and active respiration, and is adapted by nature to live and thrive best in the open air; and it is in overcrowded, badly-ventilated stables, where sanitary rules are ignored, that horses are shortest lived.

I shall come to the question of ventilation in due course, after we have settled the planning and paving. The methods are numerous, and the circumstances of each case must be fully considered in adapting means to the end. I must point out that ventilation cannot be efficient unless a sufficient amount of space be allotted to each horse, and unless the inlets and outlets are kept patent and the pavement properly designed. It is no uncommon experience to go into a stable, even one that is managed by one who would consider himself much insulted if you ventured to suggest anything wrong, and find every door and window shut, the ventilators closed or choked with bundles of straw, and the keyhole and every crevice through which fresh air can enter carefully stopped up, whilst the atmosphere is so impregnated with ammonia and organic impurities that it makes one gasp for breath and brings tears to the eyes. The drains, too, will probably be found in such a condition that they are worse than useless, and whilst they fail to carry off effete material, are themselves a fruitful source of noxious gases and organic impurities. Unfortunately, the floors of many stables are made of such material that it is impossible to obtain a quick and thorough removal of urine, &c., which collects in little pits and crevices, and there decomposes and leaks into the subsoil, which in time becomes thoroughly saturated with all that is most baneful. You have only to see the cobble paving taken up from an old stable to become thoroughly conscious of this, and it will be enough to make you insist on having a floor which is impermeable, and which can be easily cleaned with water and a brush.

The temperature of the stable is another very important point. A hot stable is generally a foul one, whereas there is a great deal of truth in the old saying that "A cool stable makes a healthy horse."

It is especially necessary that a horse should not be kept in a hot stable, when he has often to leave it and stand about perhaps for hours on a cold night with scarcely any shelter or protection, when he will be much more liable to suffer harm if he has left a hot stable than a cool, well-ventilated one.

There can be no question, I think, that, whenever it is possible, horses should be kept in loose boxes rather than stalls. No matter if the box be not more than 10 ft. square, the horse will be able to rest better in it, to select the easiest position, to move about and be more comfortable and contented. He will be much less likely to acquire the bad habits of crib-biting, kicking, &c.

Each horse in a stable should be allowed at least 1,200 cubic ft. of space, and there is no object in having the floor space larger than necessary, whilst the cost of bedding will be proportionately increased.

The War Office require 1,500 cubic ft. in cavalry stables, with more space for officers stables, and loose boxes.

There is no doubt that straw looks best in a stable, and horses which lie on it are more easily kept clean than those whose coats get ingrained and stained with moss-litter; and although the latter is said to keep the stables purer, I believe that a stable which has good paving and efficient drainage and ventilation can be kept quite as healthy where straw is used.

A point that is too often forgotten is that the food of a horse should be carefully stored.

The position of the corn-chamber and hay-loft depends largely on the nature of the site, but the arrangement should be convenient for the cutting, bruising, and mixing of the fodder.

It is generally found most convenient to have a space on the stable floor, and even when such accommodation is provided on the upper floor, one often finds an empty stall or box utilised for this purpose.

A truss of new hay or straw occupies about 11 cubic ft. of space and a cubic capacity of 396 ft.—*i.e.*, 8 ft. 3 in. by 8 ft. by 6 ft. in height will give a floor space of 66 ft., which will be sufficient to hold thirty-six trusses, or exactly one load of hay.

* A paper read at a meeting of the members of the Architectural Association Discussion Section on Friday, October 18, 1901.

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Computing the daily consumption per horse to be 16 lbs., this would provide storage for 135 days. Old hay weighs 56 lbs. and new hay 60 lbs. per truss, and the size varies between 3 ft. by 2 ft. by 1 ft. 3 in. for the former, and 3 ft. by 2 ft. 6 in. by 1 ft. 6 in. for the latter, or 7·5 cubic ft. and 11·25 cubic ft. respectively.

From about 8 to 10 lbs. of oats or mixed corn, according to the size and work required of the horse, per diem is considered sufficient.

Oats weigh from 38 to 40 lbs. per bushel, and a bin measuring 6 ft. by 6 ft. by 3 ft. in height will hold about eighty bushels.

Arrangement and Planning.

In selecting a site for country house stables on a large scale, and stud farms, the utmost care should be taken to place such buildings in a warm, dry, and well-sheltered situation, convenient to the residence, or in the case of a stud farm, to the groom's house and the home farm; and in the latter case a suitable position would be off a roadway leading to the farm buildings, with the groom's house on one side, if possible facing south. If you can take advantage of a wood or plantation to shelter your buildings from the north and east winds so much the better.

The buildings may take various forms of plan as circumstances may govern, but for all first-class stables on a large scale the quadrangular or an oblong form appears to be the best and most suitable; and by placing the back of your buildings to the north you secure the maximum amount of sunshine to your yard and boxes.

The administrative department such as the coachman's residence, sleeping-room for grooms, harness and fodder rooms, should be in a central position and easily accessible from the stalls and loose boxes. Where there is plenty of room for the yard, as in the country, it will be easy to dispose your rooms to the best advantage as regards aspect; but in London, where you are cramped for room, great care is required in planning, but I have found cases of well-planned stables for a large number of horses in towns.

If possible it is better to do without rooms or lofts over stables, but where they are necessary the floors should be of concrete, for if the grooms' rooms are immediately over the horses, and with wooden floors, the noise is liable to be disturbing at night; and in the case of the hay-loft being over the stable the forage is likely to be contaminated.

The size of the ordinary stable, such as I have mentioned as suitable for the professional man, may be arrived at by the cubic measurement necessary for the number of horses it is to hold.

For the stalls a minimum width of 16 ft. 6 in. is sufficient for a stable with a single row of stalls, which gives 9 ft. 6 in. for the division and 7 ft. passage-way at the heels, 6 ft. 2 in. centre to centre of divisions and a height of 12 ft. to the ceiling. This provides a cubic space of 1 221 feet per horse.

In the case of stables with a double row of stalls, a width of 29 ft. and a height of 12 ft. allows 1,073 cubic feet per horse.

If the roof be open, 27 ft. is sufficient for the width of stable, with a height of 10 ft. 6 in. to the under side of tie-beam. This gives 1,260 cubic feet per horse.

A combination of stalls and loose-boxes under the same roof is the arrangement generally adopted.

For loose-boxes, 12 ft. by 12 ft. by 12 ft. high gives 1,728 cubic feet.

For sick-boxes, 14 ft. by 12 ft. by 12 ft., 2,016 cubic ft., and a minimum area of 11 ft. by 11 ft., or 121 feet superficial, should be given to each loose-box.

The War Office are more generous, and make their ordinary boxes 14 ft. by 13 ft., and sick-boxes fitted with "slings" 16 ft. by 13 ft. deep.

Boxes for hunters should be at least 12 ft. by 12 ft., and for mares foaling 15 ft. by 15 ft., or thereabouts.

I have not included racing stables, or such large buildings as omnibus and tramway stables, as each would require more time than that allotted for my paper.

In designing town stables it is always a difficult matter to obtain as much frontage as can be got in the country, and it is generally necessary to have the depth at right angles to the frontage, whereas in the country the length may be parallel to the frontage, thereby allowing more light and better means of ventilating.

Paving and Draining.

All paving should we water-tight, durable, and non-slippery, and these conditions are most nearly filled by the use of the adamantine clinker bedded on concrete, not less than 6 in. thick. Before the concrete is laid the utmost care should be taken to ensure that the surface of the ground is solid and levelled to the proper falls.

The adamantine clinkers are 6 in. by 1¾ in. by 2½ in. deep, with chamfered edges, have a sandy surface and of a buff colour, which gives the floor a brighter appearance than when paved with vitrified bricks. The grooves in paviors are made semicircular, and those with the grooves crossing them diagonally, so that the brick may be laid transversely whilst the drainage will take a diagonal course towards the central channel.

In cavalry stables good cement concrete paving is found to answer most advantageously, but the stables should not be taken into use for three months after it has been laid, so as to give it ample time to set hard.

The floor of the stalls should have a fall of not more than 1½ in. in 10 ft., and the passage at the back should have a slope of 1 in 40 to centre of channel. The stable floor should be 2 in. above the level of yard.

A greater fall than 1½ in. in the length of the stall is not only unnecessary, but it puts a strain upon a horse and affects those which do not lie down to sleep. And I have frequently observed horses resort to all sorts of positions, sometimes right across the stall, in their endeavour to stand easily. Some owners of horses contend that the paving should be perfectly level, and for this purpose an iron gutter with a perforated top is designed with a slope in the bottom of 1 in. to 1½ in. in the length of the stall.

Both stalls and loose boxes should be free from traps or gullies, and the channels should discharge into traps in the open.

The herring-bone pattern of paving, to my mind, gives the most pleasing effect for passages, yards, and coachhouses.

Stock bricks and granite cubes are sometimes used, but the former are too soft for prolonged wear, and the latter share the disadvantage with the vitrified bricks of becoming slippery with wear.

But no description of paving can supply a floor that will do without brushing and washing, and it is impossible to have a sweet and healthy stable unless the litter is removed once a day and the channels thoroughly washed down.

Ventilation.

It is always desirable to have plenty of light—say at least 9 ft. super of glass space per horse, and if possible to design your window openings at a sufficient height, not less than 7 ft. above the floors. They should be placed opposite each other, and made to open by being hinged at the bottom and falling inwards, so that through ventilation may be obtained and the windows opened or closed as the temperature of the stable may necessitate.

Hopper ventilators may be used for this purpose. It is quite an exploded notion that dark stables are conducive to putting on flesh; on the contrary, defective sight, causing shying and ill-health, are the result.

When it is not possible to obtain windows on either side, Sherringham ventilators should be used for the inlet of fresh air, and a course of air-bricks, about 1 ft. 6 in. above the floor, at the head of the stall, and for the extraction of foul air gratings should be fixed at or near the ceiling level, discharging into air ducts, and carried to the ridge level by a vertical shaft, which should have an extract ventilator at the apex. The gratings should have an inlet area of 54 square inches per horse, and the vertical shafts at least 18 square inches per horse.

A fanlight over the stable door is desirable, and answers far better than louvres, as it can be closed on cold winter nights, as a recuperative process is always going on by the natural pressure of the atmosphere through crevices and under the doors, thus causing the circulation to the gratings in the ceiling; but this is not always sufficient, and it is necessary to provide means of admitting fresh air as above described by means of ventilators and gratings. The temperature of a stable should average between 50 deg. and 60 deg., and to a great extent the automatic action of the ventilators can be depended on, whilst a careful attention to the prevailing wind and the pressure of the atmosphere by the opening and closing of doors and windows will result in an even and healthy temperature.

For loose boxes when the roof is open lanterns with fixed louvres may be used, and thus form an agreeable feature in the elevation.

Details and Fittings.

All sharp corners liable to injure the horses should be avoided, as well as all projections in the nature of mouldings internally. The external angles of masonry and the outside edges of door jambs, where the doors are not hung flush with the external face of the wall, in which case the inner edges should be rounded to a height of 8 ft., and in the case of brickwork this can be done by the use of bull-nosed bricks. These bricks can also be used for window-sills, where the openings are so low down as to make them dangerous to passing horses, by the use of the ordinary square projecting stone cill.

If the walls are plastered or rendered in cement, a washable distemper of an agreeable tint may be used. Where a matchboard dado of elm or other hard wood is preferred a border of tiles above has a good effect, but they should not be glazed, as I am of opinion that the glare of light on the shiny surface is neither good for man nor horse. A neat-struck and fair joint for brickwork and the wall whitewashed looks clean and is healthy. The custom of colouring brickwork is objectionable.

The entrance door should be in two heights, and hung to open outwards—unless made to slide—with a fanlight over for ventilation, and the opening should not be less than 8 ft. high, 4 ft. 6 in. in width.

The external doors to loose boxes should have an iron grille fitted to the upper half of opening fastened with a flush spring catch, and hung to fall outwards. The internal doors to loose boxes should be 3 ft. 8 in. wide, and hung to open outwards or to swing both ways, but should not be made to open inwards only, as a horse generally takes up his position directly inside the door, and thus prevents its being opened.

Horses are separated in the stable either by wooden divisions technically known as traversers, by bales, or by poles, the latter being chiefly used in cavalry stables.

The general plan adopted is that of a wooden division with an ornamental heel post and a wrought iron ventilating ramp on the top.

A sill with a groove is fixed at the bottom to receive the boarding or cleating as it is termed, 1½ in. thick of well-seasoned oak, elm, teak, pitch pine, or red deal, fixed vertically into an intermediate iron rail which takes the underside of the ramp.

Plain wooden divisions without the ramp should be 4 ft. 6 in. high at the heel post, and 7 ft. at the head. The heel post may be of iron or wood carried up to the ceiling and strongly fixed and bedded in concrete at the base.

Where an iron ramp is used, the intermediate rail should be fixed at a height of 4 ft. 3 in. from the floor, and the ramp should be about 6 in. at heel post, and 2 ft. 6 in. high at the head. The height of the middle rail being only 4 ft. 3 in. high brings the horses into close proximity, and it is necessary to have a close panel of wood lined with sheet-iron for a distance of 3 ft. 6 in. from the head.

Portable divisions, with clutch-boxes for fixing, are sometimes fixed with the advantage of converting two stalls into a box.

Safety bars are useful, as they prevent horses which have got loose at night from injuring themselves by over-feeding, and others by kicking.

The pillars of loose boxes and heel posts of divisions should be about 4½ in. in diameter, with ornamental heads in brass or cast-iron, and the rings for pillar chains which are fixed on the front of the post or on either side, may be of brass or wrought-iron.

Loose-box partitions are similar to the stall divisions, and differ only in the top rail of the ramp being level instead of curved. The iron ventilating panels should be deeper in the front and door than in the partition. The pillars may be stiffened by the use of a wrought-iron bar in the form of an arch connecting the two. But the plainer the posts are made the better, and they should be firmly bedded in the concrete beneath the paving.

Wrought-iron work is preferable to cast-iron, but requires to be galvanised or frequently

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painted, as all ironwork is largely affected by the salts of ammonia.

Brewers' and omnibus companies' stables are usually divided by means of bales. These are suspended at one end from poles, secured by cleats to the upper surface of the tie beams, running the whole length of the stable or from a hook in the ceiling. At the manger end each bale is attached by a wrought-iron link, and protected by sheet iron for a length of 3 ft.

They are made of elm or oak 2 in. thick and 14 in. deep. The upper bale is usually 8 ft. long, and suspended 2 ft. 1½ in. above the floor to the underside, and the lower bale 4 ft. long, with a space of 3½ in. between, and bolted together by ⅝ in. iron bolts.

The use of bales can only be tolerated on the score of economy of space, and they are frequently interspersed with divisions. They are soon worn out and become destroyed, and are dangerous, as horses get their legs over them when kicking, so that they should always be provided with safety hooks for the quick release of the horse.

For farm stables, &c., a plain manger of oak or elm, bound on the outer edge with sheet-iron, is the most economical, and may be considered the most suitable. They should be fixed at a height of 3 ft. 7 in., should be 12 in. deep, and can be fixed on brick corbels or manger posts, and should have iron bolts to secure them to the wall. These bolts should run through the manger, and so prevent the horse from throwing out his food with his nose.

These mangers, though fulfilling the requirements of strength and economy, are not suitable fittings for a first-class stable, and for this purpose there are a variety of designs manufactured in cast-iron, with rounded edges.

The generally accepted design is that with the corn-trough and hay-rack at the same level, and with the rack in this position the horse feeds comfortably, and without the hay-seeds falling into his eyes. Much attention has been given to mangers with the view of protecting the horse from injuring his head by getting it under its fittings, and for this purpose stout boarding or concrete is sometimes carried down to the floor, and a manger is manufactured with a guard of wrought-iron bars carried down to the floor level from the manger plate.

This arrangement also prevents the bedding being packed underneath the manger instead of being properly cleared out of the stall each day.

Corner fittings are usually fixed in the angles of loose boxes.

Halter-tying weight-boxes should be fixed beside the manger in the loose box and beneath the manger in the stalls.

Dressing rings of wrought-iron or brass should be fixed on either side of the stalls, and also on the walls externally.

Where the walls are not cemented or boarded, and the brickwork is left bare, it is necessary to provide kicking planks of elm or oak 1½ in. thick, about 4 ft. high and 5 ft. long, from the end of the stall. In some cases mats are hung over the backs of the stalls to deaden the sound of kicking and prevent injury to the horses' heels.

The harness-room should be fitted with a stove, and a supply of hot water being often necessary it should have a back boiler, from which also a row of hot-water pipes may be taken to warm the coachhouse.

For keeping bits, curb chains, spurs, and ornaments, especially those of steel, it is necessary to provide a cupboard with a glazed front and lined with cloth. Their fitting should be placed over the fireplace or against an inner wall. A stout deal table, a saddle-horse, saddle-airer, and girth-stretcher should also be provided.

The following brackets may be of ornamental cast iron and firmly fixed to a wooden rail :—

For Saddlery.

I. No. 1 ladies' saddle bracket.
II. No. 1 gentleman's saddle bracket.
III. No. 1 stirrup bracket.
IV. No. 1 girth bracket.
V. No. 2 bridle brackets.

For Driving Harness.

VI. Single-harness pad bracket.
VII. Double-harness pad bracket.
VIII. Collar brackets.
IX. Martingale and crupper bracket.
X. Rein and crupper bracket.
XI. Bridle brackets.
XII. Harness brackets.

The coachhouse doors should be made to open outwards if hinged, and with Collings's hinges locking bar and stops. They may be made to slide on runners or the opening may be closed with a revolving iron shutter. Either of these arrangements is more convenient than a centre post.

A fanlight over the door may be sufficient for lighting purposes, but care should be taken to properly ventilate the coachhouse.

In some cases where extra accommodation is required it may be necessary to construct a basement, when the carriage may be lowered or raised by an elevator.

The corn should be stored in a wooden chamber, and in large stables a special granary is constructed, apart from the stable, with an air space beneath the floor, and bins constructed for the reception of the corn.

Galvanised iron bins of various sizes, with sloping lids, may be provided in small stables.

The Winchester bushel, which was formerly the standard for England and originally kept at Winchester, was measured by a law of King Edgar and observed throughout the kingdom. It contained 2,150·42 cubic inches. The imperial standard bushel now used contains 2,218·19 cubic inches. The proportion of the latter is about 32 to 33 of the Winchester measure.

Sliding doors are the most convenient for the hayloft, and it will be found the best method to suspend them from a wrought iron rail and secured by a locking bar.

A small hoist will be useful for lifting the sacks of grain or trusses of hay to the upper floor.

The water required for the various purposes may be obtained from a well ; but in most cases it will be obtained from the company. A good-sized cistern should be provided.

Gas is most generally used for lighting, and care should be taken to fix the brackets or pendants high enough to be out of the way of the traffic, and with wire domes.

In conclusion I must say that I have purposely omitted any reference to the architectural treatment of the buildings, and may here remark that it is much better to design with taste and build with strength than to attempt the cheap and nasty.

Nothing causes so much displeasure and dissatisfaction as jerry-built work, which is continually requiring repairs, and is thus a constant source of annoyance and expense. So that if our stable is to prove a success it should be well planned, well built, thoroughly dry and wholesome, and properly drained, and efficiently lighted and ventilated.

ARCHITECTURAL SOCIETIES.

Glasgow Institute of Architects.—The annual general meeting of this Institute was held on the 15th inst., Mr. John James Burnet, President, in the chair. The President, in moving the adoption of the annual report, said the year had not been without its share of responsibilities, but he believed the Institute was becoming more and more aware of the exact nature of its responsibility as one of Glasgow's corporate bodies, and was becoming recognised as capable to advise in its interests. It was with pleasure that he had to record the very kindly reception which had been given to the circular which was issued in the early part of the year soliciting from the members some financial support for the building fund of the college. That an institution offering educational facilities not only in the practice of architecture, but in all crafts—he would not say depending for their position on architecture, but largely depending for any artistic development of their practice on the profession—should not, in the constituent parts of its governing body, include architects seemed a gross error, but he believed that this was being recognised by those in authority, and that it might ere long be put right. In their relation with the tradesmen, or craftsmen as he preferred to call them, they had endeavoured to hold their position as neutrals ; and though they had not given that prompt response to their request to consider with them a form of contract, it was primarily because it was felt that little should be done to interfere with the liberty of each man, either on the one side or the other, to enter into such a form of contract as might seem to him most suitable in the particular circumstances ; and, above all, it was particularly necessary, in a large industrial and commercial centre like Glasgow, to avoid anything that might be looked upon as purely parochial, and might militate against the freedom of tendering by those who were outside their boundaries. In skill their craftsmen had nothing to fear from outside competition, and they could best help them and their clients to a clear and concisive contract by clear and concise drawings and descriptions of their designs. The Institute had again endeavoured by revising its suggestions for competitions to make them more useful to the public, and likely to result in abler men submitting designs; but it had done so only as recognising the competitions as a seemingly necessary evil, and hoping that the public would ultimately recognise that it was not the best way to get "light and leading," and that the only ultimate competition, amongst those who were to be their advisers, was the competition amongst men in their daily work to earn their confidence, and not by a submission of their work which, from its very nature, if it was to be of any real use to them, could only be judged under expert advice. The Institute was convinced that architecture, in the true sense of the word, could only be good when it was the result of close personal consultation between the architect and his client, between whom the structure would grow consciously fit for its purpose and unconsciously artistically effective. One of the most interesting events of this year's work had been the position which the Institute felt itself obliged to take in reference to the reconstruction of one of Glasgow's most important public and charitable institutions. It was with very great regret that the Institute felt obliged to bring the result of the Royal Infirmary competition before the public of Glasgow, and seemingly to stand in antagonism to that body of gentlemen who so freely and generously gave so much of their time to the public service connected with the management of such institutions ; but surely, if the Institute had any public duty whatever to perform, it was that of placing before the public any matter within its technical knowledge in which it felt they were being misled. No personal regard for such gentlemen should be permitted to influence its expression of opinion. In this instance the question was a very vital one, and one in which the public were entitled to the very best technical advice that could be obtained. What the Institute pleaded for, and asked the public to demand, was that such technical advice should be taken before they (the public) were led to support a scheme which, in its opinion, if carried out as at present proposed, could only lead to a very heavy first cost, enormous annual expenditure, and gross inefficiency for the purpose in view. The Council for the ensuing year was elected as follows :—Messrs. Alex. Petrie, John Jas. Burnet, James A. Morris, David Barclay, W. Forrest Salmon, A. N. Paterson, John Keppie, H. K. Bromhead, James Lindsay, N. Macwhannell, Campbell Douglas, T. L. Watson, J. M. Monro, Alex. M'Gibbon, A. Balfour, Jas. Miller, and John A. Campbell. Mr. John Keppie was elected a representative on the Joint House Committee.

TRIBUNAL OF APPEAL CASE :

THE LAYING-OUT OF NEW STREETS.

The Tribunal and Appeal under the London Building Act, 1894, sat at the Surveyors' Institution on Monday to hear an appeal by Mr. A. Cameron Corbett, M.P., under Sections 9 and 10 of the Act, against the order of the London County Council, dated July 16, refusing to sanction the formation and laying-out of a new street for carriage traffic out of the west side of Torridon-road, Hither Green, on the St. Germans estate. The members of the Tribunal present were Messrs. J. W. Penfold (Chairman), A. H. Hudson, and A. Gruning.

Mr. Cuningham Glen, barrister, appeared for the appellant, and Mr. Andrews, from the solicitors' department of the London County Council, for the respondents.

The case for the appellant was somewhat on the same lines as that advanced in the Forster appeal, heard a few weeks since by the Tribunal. The appellant is the owner of the St. Germans estate of nearly 300 acres, which has been developed within the past five years, and he now proposed to lay out the land at the western end of the estate for building purposes. The City Council objected because of the absence of direct communication between this and the Forster estate ; but in the appeal Mr.

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Glen pointed out that one end of the proposed road communicated with Torridon-road and the other with Killearn-road, which were both open for carriage traffic. There was thus, he contended, "direct communication."

Mr. Hudson's suggestion and the hearing of the appeal should be adjourned pending the preparation of a plan dealing with the estate as a whole, but after considerable discussion it was decided to go on with the case.

Mr. Andrews said this was a case in which the Council felt called upon to ask, on behalf of the future residents of the district, that the roads and streets should be laid out on a general plan, with due regard to the requirements of the whole rapidly-developing neighbourhood rather than isolated estates. They were taking their stand upon a high principle. The respondents' case was, he argued, covered by the judgment in Woodham *v.* the London County Council, in which case the Tribunal had decided that very similar formation of roads was not direct communication within the meaning of the Act, and on a special case being stated for the High Court that view was upheld. Therefore, it was for the convenience of both persons laying out estates and persons interested in the matter that there should be consistency in dealing with these things. The explanation of the Council having approved of a somewhat similar formation with regard to Killearn-road was that it was part of a large scheme, and if it had come before the Council as an isolated application it would not have been approved any more than the principle of the application now before the Tribunal would be approved. Mr. Andrews also cited the case of the Hendon Local Board *v.* Pounce to show that if the result of requiring direct communication was that the land could not be laid out for building purposes, that was no real answer to the objection.

In the result the Tribunal allowed the appeal, on the condition that a strip of land about 230 ft. long by 40 ft. wide, running eastward from the southern end of the proposed new road, should be reserved unbuilt upon for future extensions of the road.

APPLICATIONS UNDER THE LONDON BUILDING ACT.

THE undermentioned applications under the London Building Act were dealt with by the London County Council on Tuesday. Unless otherwise stated consent was given. The names of applicants, &c., appear in parentheses :—

Working Class Dwellings.

Lambeth, North.—Three blocks of intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site between Gloucester-street and Burdett-street, Lambeth ; and of two blocks of intended dwelling-houses, to be inhabited by persons of the working class, proposed to be erected on the north side of Burdett-street and south side of Gloucester-street respectively, with irregular open spaces at the rear, and the boundary fences of the site at less than the prescribed distance from the centres of Gloucester-street and Burdett-street (Mr. S. Bircham).

Lines of Frontage and Projections.

Woolwich.—Houses with projecting one-story shops and bay windows, on the eastern side of Woolwich-road and the south-eastern side of Greenvale-road, Eltham (Mr. G. F. Logsdail on behalf of Mr. A. Cameron Corbett, M.P.).

Lambeth, North.—The rebuilding of Nos. 1 to 38, inclusive, New Cut, Lambeth (Messrs. Clutton on behalf of the Ecclesiastical Commissioners).

Strand.—A stone canopy and balcony over the entrance to the Town Hall, Charing Cross-road (Mr. J. Murray on behalf of the Council of the City of Westminster).

Dulwich.—The erection of wood and tile pents over the entrances to fourteen semi-detached houses on the west side of Calton-road, Dulwich (Mr. J. H. Cooper).

Dulwich.—The erection of a one-story office building on the south side of Thurlow Park-road, Dulwich, next Dulwich railway station (Messrs. Marten & Carnaby).

Hackney, South.—One-story shops on part of the forecourts of Nos. 20 to 44 (even numbers only inclusive), Rushmore-road, Clapton (Messrs. Holbrook Brothers on behalf of Mr. Filman).

Hampstead.—Three four-story bay windows to a block of residential flats on the site of Nos. 6 and 7, The Mount, Hampstead (Mr. C. W. Matthews).

Islington, South.—One story addition with an iron and glass shelter in front of Nos. 399, 401 and 403, City-road, Islington, at the corner of Torrens-street, so far as relates to the construction of a lean-to roof and skylight on part of the flat roof of such one-story additions (Mr. D. Hay on behalf of the City and South London Railway Co.).

Kensington, South.—An extension of period within which the erection of an addition to No. 12, Sumner-place, Kensington, to an advanced line in Old Brompton-road, was required to be commenced and completed.

St. George, Hanover-square.—An iron and glass conservatory at the first floor level at 41, Park-lane, Hyde Park (Messrs. Wetherill and Martin on behalf of Lady Meux).

Kensington, South.—A one-story addition to No. 67, Marloes-road, Kensington, to abut upon Scarsdale-villas (Messrs. J. Surrey & Son on behalf of Mrs. M. Surrey).—Refused.

Westminster.—An addition in front of No. 9, Trevor-terrace, Knightsbridge (Mr. T. Shilston on behalf of Mrs. Lewis).—Refused.

Width of Way.

Poplar.—Two sheds at the West India Docks, Poplar, at less than the prescribed distance from the centre of Bridge-road (Mr. T. Hardy on behalf of the Managers of the London and India Docks Company).

Space at Rear.

Dulwich.—A modification of the provisions of the section with regard to open spaces about buildings, so far as relates to the proposed erection of a house on the south side of Lytcott-grove, East Dulwich, near Melbourne-grove, with an irregular open space at the rear (Messrs. Allen & Hoar on behalf of Mr. G. Bransom).

Whitechapel.—A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of additions to No. 131, Commercial-street, Whitechapel, by reason of which additions the premises would have an irregular open space at the rear, and would extend above the diagonal line as directed by Section 41 of the Act to be drawn (Messrs. Still, Wheat, & Luker on behalf of Messrs. Noakes & Frosts' trustees).—Consent refused.

Width of Way and Lines of Frontage.

Strand.—A factory building on the east side of Martlett's-court, Drury-lane, Strand, at the corner of Crown-court (Mr. H. O. Ellis on behalf of Mr. L. Upcott Gill).

Poplar.—A two-story addition to the technical schools, East India Dock-road, Poplar, to abut upon Kerbey-street, with the external walls at less than the prescribed distance from the centre of Kerbey-street (Messrs. J. & S. F. Clarkson on behalf of the Governors of the George Green Schools).

Brixton.†—A deviation from the plan approved by the Council on April 30 for the erection of a block of residential flats on the site of 400 and 402, Coldharbour-lane, Brixton, so far as relates to an increase in the height of the proposed building (Mr. F. A. Powell).—Consent refused.

Formation of Streets.

Lewisham.—A new street for carriage traffic to lead from Blythe-hill, Catford, to Montem-road.—That the name Ravensbourne-road (in continuation) be approved for the new street.

Lewisham.—Streets for carriage traffic on the Crofton Park estate on the eastern side of Crofton Park-road, Brockley.—Consent refused.

Woolwich.—New streets for carriage traffic to lead from Samuel-street to Prospect-row, Woolwich (Mr. J. Bull).—Consent refused.

Poplar.—A new street for carriage traffic to lead from Chapel House-street to East Ferry-road, Poplar (Lady Margaret Charteris).—Consent refused, and as the land upon which the street is proposed to be formed is below Trinity high-water mark, the attention of the local authority, district surveyor, and applicant be called to the provisions of Part XI. of the London Building Act, 1894, with regard to the erection of dwelling-houses upon low-lying land.

Wandsworth.—A new street for carriage traffic to lead out of the west side of Gwendolen-avenue, Putney (Mr. J. T. Leader and Mr. S. Taylor).—Consent refused.

Woolwich.—A new street for carriage traffic to lead out of the west side of Swingate-lane, Plumstead (South Metropolitan Brick Co.).—Consent refused.

Height of Buildings.

Strand.—Building on the east side of Martlett's-court, Drury-lane, at the corner of Crown-court, to exceed in height the width of Martlett's-court (Mr. H. O. Ellis on behalf of M. L. Upcott Gill).

Width of Way and Height of Building.

Rotherhithe.—Factory building on the east side of Tower Bridge southern approach, Rotherhithe, with the external walls at less than the prescribed distance from the centre of Horselydown-lane, and to exceed in height the width of that street (Mr. L. A. Withall on behalf of the Army Clothing and Equipment Co., Limited).—Consent refused.

Width of Way, Line of Frontage and Construction.

Kensington, South.—A wooden door-frame and doors in front of No. 2, Cranley-mews, Kensington (Mr. A. M. Torrance on behalf of Mr. J. D. Hill).

City of London.—An enclosed iron and concrete gangway across Bull's-head-passage, City, to connect Nos. 93 and 97, Wood-street (Mr. A. Conder). Consent refused.

Width of Way, Line of Frontage, and Deviation from Certified Plans.

St George, Hanover-square.—Certain deviations from the plans certified by the District Surveyor, under Sections 13 and 43 of the Act, so far as relates to the proposed rebuilding of No. 47, Hertford-street, Mayfair, at less than the prescribed distance from the centre of the street, with an irregular open space at rear, and with a projecting porch and an oriel window (Messrs. Hoare & Wheeler).—Consent refused.

Dwelling Houses on Low-lying Land.

Woolwich.—Six dwelling-houses on low-lying land on the south side of Abbey-grove, Abbey Wood.

The recommendation marked † is contrary to the view of the Local Authority.

THE GROVE VALE DEPÔT.

UNDER this title the Borough Council of Camberwell have just opened a large establishment which is intended as a depôt in which the work of the borough could be centralised and the stores and materials required carefully guarded and distributed ; and its situation, in the middle of the borough, and in close proximity to the main road arteries, fits it to be the centre of municipal work and activity, and it will, it is hoped, be of the greatest assistance in the endeavour to conduct the work of the borough efficiently and economically. The Grove Vale Depôt is situated upon the north-east side of Grove Vale, almost opposite the East Dulwich station of the London, Brighton, and South Coast Railway.

The depôt premises are divided into three portions :—

(1) The main depôt ; (2) a plot of land lying between the approach road and the railway embankment, which is used for the storage of materials for road-making and other purposes ; and (3) two houses with stable for the outdoor superintendent of the district, and the foreman harness-maker, who is employed in the depôt.

The main depôt buildings have been erected from the designs of Mr. William Oxtoby, the Borough Engineer. The builder is Mr. H. L. Holloway, of Union Works, Church-street, Deptford, whose contract for the entire work, amounting to the sum of 28,105*l.*, was accepted by the last Vestry. The clerk of works, Mr. H. Castle, has supervised the execution of the work on behalf of the late Vestry and of the Borough Council.

The stabling consists of two blocks, 91 ft. 3 in. by 32 ft. each, and 12 ft. high. Each block contains stalls for nineteen horses and four loose boxes. The floors are laid with chamfered adamantine clinkers, the walls lined with glazed bricks. The eight loose boxes are all 15 ft. 4 in. by 9 ft. 4 in., and each is provided with a separate doorway to the yard.

The stall and manger fittings have been furnished by Messrs. Musgrave & Co., of Belfast and London. In fitting up these stables, the health, safety, and comfort of the horses were the points to which particular attention was given. The stall divisions and loose box enclosures are very strongly made, being practically unbreakable. The heads of the divisions are fitted with solid iron panels to prevent the horses annoying one another while feeding, and the remaining part of the divisions is fitted with open panels to allow of free ventilation throughout each range of stabling. The halter tyings are noiseless, and are arranged in such a manner that when the animal is feeding or lying down there is practically no weight dragging at his head, the whole weight being taken off by means of an automatic stopper.

The cart sheds, one 100 ft. by 40 ft., and one 80 ft. by 48 ft., are fitted with pitch-pine bumpers and also stand posts and valves for flushing purposes. There is room for eighty carts and vans. The floor is paved with asphalt and the walls lime-whited.

The fodder and corn store and machinery connected therewith take up a portion of one block, and is a four-story building. The whole of the walls are lime-whited. The machinery has been provided and fixed throughout by Messrs. Phillips & Son, of Reading. This includes a gas engine of 20 h.p., used for operations connected with the crushing of the corn, the cutting and sifting of chaff, and mixing of fodder ; a bagger is used for the automatic filling of sacks, and a crushing mill for oats and beans, a grain elevator, an automatic mixer and weigher, a chaff sifter, and a chaff elevator.

The workshops and machinery block has in the centre thereof an elliptical archway, 20 ft. wide, formed to provide a cartway for the horses and vehicles. Upon the west side of the archway are four shops floored with granolithic, one for smiths' work, one for farriers', and two for wheelwrights'.

On the east side of archway are the gas meter room, containing also apparatus used for the high pressure gas incandescent system ; the gas-engine room, containing a Crossley's "Otto" gas engine, used for driving the machines in the machine shop hereinafter described. In this block also are the cement store and the machinery shop.

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The whole of the machinery is kept on the ground floor, the advantages of which are sufficiently obvious. The front of the block is built of blue Staffordshire bricks, 4 ft. 6 in. high, and red glazed bricks above to first floor, beyond which stock brickwork is used, with blue Staffordshire brick arches. The whole of the shops are provided with incandescent lanterns and brackets, for use when artificial light is required.

Another block contains the general office, weigh bridge office, the weigh bridge, and the harness-making room. A large quantity of the new harness and all the repairs are executed upon the premises, and ultimately all the harness required will be made by the Council's workmen. On the first floor are the committee-room and lavatory.

All the lamps that are fixed in the yard and stables are fitted upon the patent high-pressure incandescent lighting system. The apparatus, as before mentioned, is situated in the gas-meter house, and occupies only about 2 square feet. It is entirely automatic, and to start the machine it is only necessary to light the burners. The machine stops working when the lights are extinguished. The depôt is connected by telephone with the Town Hall, from which, by means of the switchboard, communication can be obtained with the trunk and metropolitan lines and also with all the other depôts of the borough. The office and committee-room are also connected by telephone.

There are three fire hydrants in the yard, provided with sufficient hose to cover any portion of the premises. There is also a complete arrangement of electric fire-alarms in each building, which communicate underground with a central indicator in the cartway under the workshops.

It is intended that Grove Vale Depôt shall be the centre of municipal work. It will contain the central stores, and no articles of any description will be received at any other depôt or place in the borough without passing through the stores department at Grove Vale Depôt.

The depôt was formally opened on Monday, the 21st, by the Mayor, Councillor Matthew Wallace, Esq., J.P., &c. There were present several of the Mayors, Chairmen of the Works Committees, and officers of the various Metropolitan and surrounding boroughs, as well as the members of the Camberwell Borough Council.

Correspondence.

"LUX-CALOR" STOVES.

Sir,—In your last week's issue, in the notice with which you favour our new price-list of the "Lux-Calor*" stoves, you take exception to our claim that these stoves do not in any way pollute the air of the building in which they are used.

The claim is, however, a perfectly just one if the stoves are fitted as we wish them to be, *i.e.*, with a small tube attached to the exhaust at the bottom of the stove and led to the outside air. Then all the waste products—condensed water, carbon dioxide, &c.—pass away completely. If the stoves are not fitted in this way it is because the consumer will not incur the small extra expense.

Ritchie & Co.

*** This provision for the removal of the combustion products is equivalent to the use of a flue, and we see no objection to the use of condensing stoves fitted in this manner in schoolrooms, provided that efficient ventilation is secured by other means. It is well to remember that the organic matter contained in animal respiration products is more dangerous to health than any constituent in the products of the complete combustion of gas, and one of the duties of a good open gas or coal fire is to assist in the removal of polluted air from an inhabited room by increasing the rate of flow of air up the chimney at the same time that it is emitting into the room a constant current of radiant heat. An electrical heater in an unventilated schoolroom would be subject to the same objection as a condensing stove fitted in the manner indicated by our correspondent. Both are harmless in themselves, but neither constitute ventilating agents.—Ed.

BOOKS RECEIVED.

Public Health and Housing. By John F. J. Sykes, M.D. (P. S. King & Son.)

Sanitary Fittings and Plumbing. By G. Lister Sutcliffe, A.R.I.B.A., M.S.I. 5s. (D. Fourdrinier, *Builder* Office.)

Roads: Their Construction and Maintenance; with Special Reference to Road Materials. By Allan Greenwell, A.M.Inst.C.E., F.G.S., and J. V. Elsden, B.Sc.Lond., F.G.S. 5s. (D. Fourdrinier, *Builder* Office.)

Notes on Patents and Trade-Marks. By J. E. Evans-Jackson. 1s. (Mardon, Son, & Hall.)

* The name was erroneously printed "Lux-Cuber" under "Trade Catalogues" in our last issue.

The Student's Column.

GAS AND GAS FITTINGS.

17.—Gas Engines. Gas-heated Industrial Appliances.

Gas-engines.—Gas-engines are now extensively used in all large towns for driving circular saws, lathes, drills, and all the tools to be found in carpenters', engineers', or smiths' workshops which are capable of being worked by mechanical power. For these purposes engines of low horse-power are used, while the larger engines are principally employed for driving dynamos for the generation of electricity.

The practical utility of the gas-engine may be said to date from the year 1876, when the Otto engine was introduced into this country, but for a long period after this date it was thought to be impossible to construct gas-engines of high horse power. Within the last ten years it has, however, been discovered that by improving the design of the cylinder liner, the piston, and the valves, so that they may all be efficiently water cooled, engines of almost any power may be constructed. Quite recently the American Westinghouse Company have constructed an engine of 1,500 B.H.P. (brake horse power) for use with the natural gas found in the United States, and it is believed that it will be possible to make them of fully double this power.

In this country the greatest number of engines are used with ordinary town (illuminating) gas, and are of low power. Many of the gas companies allow a considerable discount when a large quantity of gas is used in the day time for power purposes, and the small ground space occupied by gas-engines as compared with steam-engines is a factor of considerable importance in large towns. According to Mr. Bryan Donkin the number of gas-engines in use in the United Kingdom at the commencement of the year 1897 was 25,700, of which 4,600 were working in London, and the engines varied in size from half-man power to 100 h.-p. Of these 50 per cent. were estimated to be below 5 nominal horse-power, and 25 per cent. between 5 and 10 h.-p., the remaining 25 per cent. being larger sizes. A considerable increase has, however, occurred since 1897 both in the number of gas-engines employed and in their powers. The use of cheap power gas, such as Mond gas, Dowson gas, or water gas, is rapidly extending, with the result that even large steam engines of several hundred horse-power are gradually being rejected in favour of engines driven by gas. Messrs. Brunner, Mond, & Co., for example, have gas engines of 500 and 650 h.-p. respectively working in connexion with their electrolytic plant in Cheshire, and several municipal authorities are using gas-engines of over 100 h.-p. for the generation of electric light.

The cost per brake horse power of running a gas-engine varies with the price of the gas, the heating power of the gas, the description of gas-engine employed, and the size of the engine; but the following table may serve to convey an approximate idea of the working cost of one of 10-h.p., taking town coal-gas at 3s., water-gas at 4d., and Mond gas at 3d. per 1,000 cubic feet:—

	Heating value of gas. B.T.U. per c.-ft.	Gas consumed per b.h.p. per hour. C.-ft.	Cost per b.h.p. per hour. Pence.
Town gas ...	624	20	0·72
Water gas ...	304	40	0·16
Mond gas ...	155	80	0·24

Water gas can be manufactured by the Dellwik process at a cost of about 3½d. per 1,000 cubic feet delivered in the gasholder. The water gas plant does not occupy much ground space, and where not less than 500,000 cubic feet are consumed per day the gas can be manufactured and consumed on the works, in lieu of town gas, with great economy; but water gas cannot be distributed over large areas at so low a cost as 3½d. or 4d. per 1,000 cubic feet.

Mond gas has only about one-half the heating value of water-gas, but can be manufactured at a cheaper rate. Parliament has recently sanctioned the formation of a company to undertake the supply of Mond gas, or other similar fuel gas, to a number of towns in Staffordshire at a maximum price of 3d. per thousand cubic feet to consumers taking not less than 16 million cubic feet per annum, and 4d. per 1,000 cubic feet to those consuming less than this quantity. The company may refuse to supply any consumer requiring less than 4 million cubic feet per annum. Whether Mond gas is as suitable for distribution for power purposes as water-gas is a matter of dispute, but should the operations of the Mond Company prove a financial success there is little doubt that the use of steam as the motive power for stationary engines of less than 100 h.-p. will soon be almost completely abandoned in this country.

Steam versus Gas.—Although, even with the best modern gas-engines, from 70 to 75 per cent. of the heat developed by combustion of the gas is lost, the proportion of heat wasted by the employment of steam-engines is yet greater. Bryan Donkin gives the following table of heat efficiencies, *heat efficiency* being the ratio of heat turned into work to the total heat received by the engine.

Percentage Proportion of Heat Converted into Work.

Agent Employed to Work Engine.	Engine of 100-h.p.	Engine of 50-h.p.	Engine of 10-h.p.
Steam	12·5	8·3	4·0
Lighting gas ...	25·5	23·1	21·2
Water gas ...	23·5	18·7	13·3
Dowson gas* ...	23·5	18·7	13·3

The proportion of heat converted into work by a 100 h.p. gas-engine is therefore about double that converted by a steam-engine.

Gas for Electric Lighting.—Gas-engines of from 6-h.p. to 14-h.p. are extensively used for driving dynamos for private electric-lighting installations; while gas-engines of over 100-h.p. are used for municipal electric-lighting stations, a cheap fuel-gas being in the latter cases manufactured on the works. Gas-engines of high power driven by town gas are more costly than steam-engines, but when cheap power gas can be obtained as a fuel steam is the more expensive. Town gas as at present supplied is of too costly a quality for economical use as a fuel, and there is little doubt that in the immediate future the gas consumers in every part of the country will demand the supply of a cheaper lower grade gas which may be economically used in place of coal for fuel purposes, the heating power of the gas being carefully tested daily by official gas examiners.

In view of the fact that gas is in many cases the most suitable agent for generating electricity, it has been proposed that electricity shall in general practice be supplied from the same works as gas, and the gas companies of Walker and Wallsend and of St. Albans have already obtained powers from Parliament which enable them to supply electricity in addition to gas.

Gas Engines for Tramcars.—Gas has been successfully applied for driving tramcars at Blackpool, Dessau, and elsewhere, the cost of traction being less with gas than with horses. The gas is compressed under a pressure of about 90 lb. per square inch in cylinders which are placed beneath the platforms of the cars, and a compressing station is provided at one end of the line to enable the cylinders to be recharged at the end of each journey.

The Otto Cycle.—The mechanism of gas-engines constructed by different firms varies considerably in design, but most of the engines at present in use work upon what is known as the "Otto" cycle. Each cycle is completed in two revolutions, during which only one impulse is given to the piston. The following are the four operations comprised in each complete cycle:—

First revolution ...	1. The outstroke of the piston draws in air and gas.
	2. The instroke compresses this charge.
Second revolution	3. The ignition is effected, causing explosion and expansion.
	4. The products of combustion are driven out by the instroke of the piston.

In England the ignition of the explosive mixture of gas and air is usually effected by means of a Bunsen flame, but on the Continent an electric spark is commonly employed.

Gas for Industrial Appliances.—Gas is already employed as a fuel in a great number of industries, and when a supply of cheap gas

* Dowson gas closely resembles Mond gas in composition and heating power.

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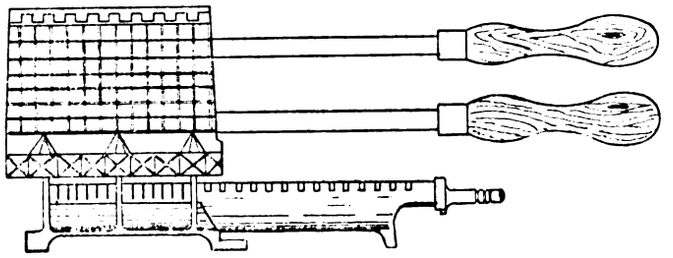

Fig. 43.—Heater for Soldering-irons.

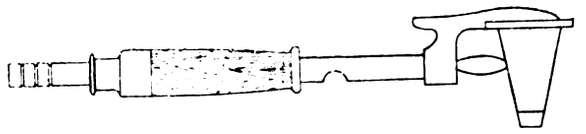

Fig. 44.—Self-heating Soldering-iron for Leaded Window Makers.

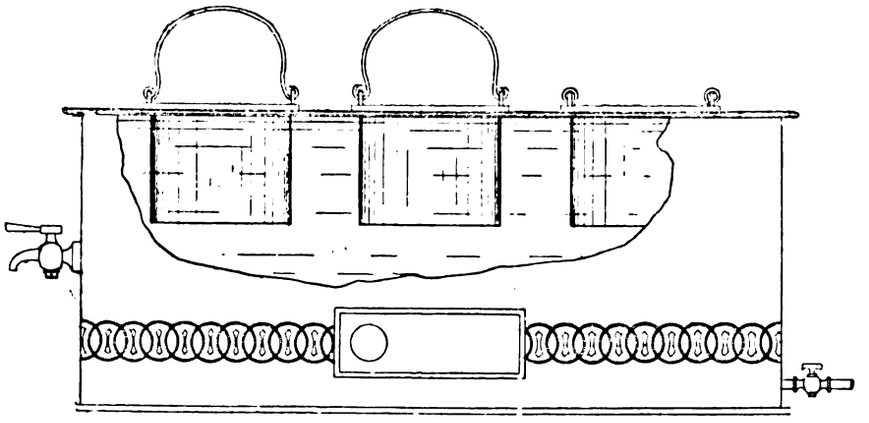

Fig. 45.—Glue-pot Stove.

is substituted for the existing costly supply, it will be yet more widely adopted. Mr. Thomas Fletcher, the pioneer in the work of adapting gas to industrial requirements, has already successfully introduced gas furnaces for enamelling, for hardening and tempering steel used for cycles, for glass-working, for gold-refining, and a host of other purposes. He has also adapted gas to many appliances of comparatively minor importance, such as blowpipes, soldering irons, and drying ovens. A vast number of ovens heated by gas for japanning work are now in operation in all parts of the country, and especially in the districts devoted to the manufacture of bicycles, the ease with which the temperature of these ovens can be adjusted to suit the description of varnish to be dried being a factor greatly in their favour. There is practically no limit to the use to which gas can be applied, but among the gas appliances already largely used in connexion with building may be mentioned gas-heated lacquering tables, blowpipes for brazing, heaters for soldering irons (fig. 43), self-heating soldering irons for leaded window makers (fig. 44), and glue-pot stoves (fig. 45), which can be made to maintain any number of glue-pots at the required temperature at very small cost.

Gas for Lead Burning.—It was at one time believed that the fusion of the edges of lead sheets in cisterns and acid chambers could only be performed by the aid of hydrogen, but it has since been found possible to perform the work equally well with coal-gas. The blowpipe jet must be small, and a comparatively high pressure must be obtained with the aid of a small foot-blower. When coal-gas cannot be conducted by a pipe to the field of operations, cylinders containing compressed coal-gas may be employed.

OBITUARY.

Mr. Thomas Lawrence.—Last Monday week, October 14, the death took place, at the age of seventy-seven, of Mr. Thomas Lawrence, founder and senior partner of Messrs. Thomas Lawrence & Sons, of Bracknell. The firm were "general providers," but became known in the building world for their "T.L.B." rubber facing bricks, which are still produced in four or five large brickfields within a few miles of Bracknell. When the Berks County Council was formed Mr. Lawrence was elected member for Warfield, a position which he retained till his retirement a few years ago, when his son, Mr. Arthur Lawrence, was elected in his stead.

GENERAL BUILDING NEWS.

Corporation Baths, Barton Hill, Bristol.—The baths about to be erected by the Corporation of Bristol in the Barton Hill district of that city are to be of red brick, with slate roof. The entrance lobby is to be on the men's side leading to the ticket office, and immediately in the interior of the building there are to be a number of commodious dressing-boxes, adjacent to which are the slipper, needle, and spray baths. These baths are also to be flanked at the other end with another series of dressing-boxes which divides the special baths from the ordinary baths. Of these there will be eighteen for men of the second-class order and six of the first-class character, a large waiting-room being adjacent. A spacious corridor will divide these single baths from the general swimming-bath and the women's department, which ranks at the end of the large swimming-bath. This bath, which is to be 60 ft. long and 30 ft. wide, is surrounded by dressing cubicles. There are ten baths for women, and in that department there is the drying-room, the wash-house, the boiler-house, and other offices. There are also waiting-rooms for female customers. Bangor slates are to be used for the divisions of the baths, and white glazed bricks are to be supplied by the Farnley Iron Company. The Lancashire type of boiler is to be adopted, suitable for a working pressure of 100 lbs., and tested to 200 lbs. per square inch by hydrostatic pressure. The boilers are two in number, and 22 ft. long by 6 ft. diameter. The architect is Mr. W. S. Skinner, of Bristol.

Reading-room, Balcombe, Sussex.—The foundation-stone of this building was laid by Lord Frederick FitzRoy on the 10th inst. When completed the building will be 50 ft. long, 24 ft. wide, and 16 ft. high, and it will be divided by a movable screen. There will be two entrances and a wide corridor, and the reading-room will be connected with the caretaker's house. Adjoining the room will be a small library, cloakroom, and lavatory. Heating will be by means of hot-water apparatus, the furnace to be in the basement. The architect is Mr. Gerald C. Horsley, of Gray's Inn-square, London; the contractor for the general work Mr. F. Pierce, of Balcombe; and the hot-water apparatus will be supplied by Messrs. Rosser & Russell, of London.

Re-opening of Marlston Church, Newbury.—This ancient church after restoration and enlargement was reopened on the 14th inst. The building as enlarged consists of nave 45 ft. long, and a chancel 22 ft. long and 18 ft. wide. The old walls were underpinned to a depth of 4½ ft. with solid brickwork in cement and a damp-proof course inserted. A walled-up doorway of the Norman period on the north side has been opened out, the stonework repaired, and a massive oak door with characteristic ironwork now fills the opening. The old oak roof of the nave has been entirely stripped, the timbers strengthened and repaired, and covered with oak boarding. An unsightly modern stone turret at the west end has been removed, and a bold turret of framed oak with traceried openings, and roofed with oak shingles, has been added. The massive oak posts and timbers which support the turret form a bold feature within the nave. The new chancel is an extension of the church corresponding to the nave in width and height, the separation being marked by an arrangement of oak timber framing. The new chancel roof in general character is similar to the old roof of the nave, and continues in a line therewith, but of more substantial construction, and is enriched with mouldings and cornices to give an appearance of richness as compared with the simplicity of the nave roof timbers. The chancel stalls are of oak with carved poppy heads, and traceried panels. The chancel steps are of polished Devonshire marble, and the floors of glazed encaustic tiles of a special design. In the south wall of the chancel are sedilia and credence, so designed as to form an attractive architectural feature. On the east wall is a richly-carved reredos in fine grained stone with Devonshire marble panels and central cross. Above is a three-light traceried east window filled with stained glass, executed by Mr. C. E. Kempe. The subject is "the Nativity of Our Blessed Lord." The new vestry is on the north side of the church, and there is a heating-chamber beneath it. The seats of the nave are of oak, and wood block floors on cement concrete foundation have been laid where seats are placed. All other nave flooring is of small-sized geometrical tiles of one uniform colour. The church is warmed by hot water with radiators. The whole work has cost about 2,000*l.* The heating arrangements were executed by Messrs. Fox & Son, of Finsbury; the wrought-iron metal work by Messrs. Clew & Sons, of Stroud; the reredos by Mr. H. Frith, of Gloucester; and the building works have been carried out by Messrs. Groves & Sons, of Shipton-under-Wychwood, from the designs of Mr. Slingsby Stallwood, architect, of Reading.

Additions to School Buildings, Yetholm, N.B.—The reopening of these buildings, after considerable alterations and additions, took place on the 14th inst. Two large classrooms for juveniles have been built, each 25 ft. wide by 20 ft. and 23 ft. long respectively. The two existing classrooms have been improved in the heating, lighting, and ventilating arrangements. Cloakrooms for the girls, infants, and boys have been built, a female staffroom added, playsheds for protection in bad weather, &c. A large portion of the adjoining field has been rented so as to enlarge the playgrounds, and new boundary walls enclosing them have been built. A heating installation has been provided, as well as a new drainage system, and various other alterations have been carried out. There is accommodation for 200 pupils. The total cost of the works, furnishing, and incidental expenses will be about 2,500*l.* The contractors were:—Mason work, Messrs. John Bruce & Sons; joiner work, Mr. John Scott; plaster work, Mr. William Bryce, all of Kelso. Mr. John Scott, Innerleithen, carried out the plumber work; Mr. William Turnbull, Yetholm, the slater work; Messrs. W. Forsyth & Sons, Edinburgh, the painter work; and Messrs. Meikle & Philp, Edinburgh, the heating. The seating has been provided by the Bennett Furnishing Co., Glasgow; the classroom partitions by the North of England School Furnishing Co., Darlington. The architect is Mr. T. P. Marwick, of York-place, Edinburgh.

Opening of New Arcades, Birmingham.—These new arcades, which, with contingent premises, are estimated to cost about 250,000*l.*, were opened on the 18th inst. They connect the thoroughfares of Corporation-street, New-street, High-street, and Union-street, and they consist of about 200 shops and offices, some of which are already occupied, and more of which are let. The main City Arcade commences in High-street, where it adjoins the Louvre, and continues to near the junction of Corporation-street and Union-street. A branch in course of construction will lead into it from New-street. The Midland Arcade runs from New-street to the City Arcade, which it joins about half-way between Corporation-street and High-street. The facades, like most of the newer ones erected in Birmingham, are of terra-cotta, and the style of architecture is Renaissance. Within the arcades the predominant colour is green, the balustrades and pilasters of the shop fronts are ornamented with green faience, shaded in imitation of malachite. A subway underneath the thoroughfares facilitates the delivery of goods to the shops. Considerable extensions of the Louvre have been carried out in connexion with the scheme, and it is intended by another company to erect a block of shops and offices in New-street, between the Midland Arcade and the City Arcade branch. The

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whole of the arcades are expected to be completed in about eight months' time, and the entire scheme about a year hence. Messrs. Newton & Cheatle, of Birmingham, are the architects.—*Birmingham Gazette.*

SANATORIUM, LIVERPOOL.—On the 18th inst. the new sanatorium for consumptives, situated at one of the highest points in Delamere Forest, near Frodsham, was opened. The architects were Messrs. Willink & Thicknesse, of Liverpool.

THEATRE, NEWCASTLE-ON-TYNE.—A new theatre of varieties, designed by Messrs. Wylson & Long, architects, of King William-street, London, is about to be erected in Newcastle. The front of the building will be in Westgate-road, from which entrances are obtained to all parts of the house. The auditorium is divided into a ground floor with two tiers over. The entrance to the stalls, fauteuils, and dress circle is obtained from the spacious entrance hall, which occupies the centre of the front. On each side of this are entrances to the pit and gallery respectively. At the rear of the pit, circle, and gallery respectively will be a spacious saloon, while throughout the building ample means of ingress and egress are provided. The building will be constructed on fire-resisting principles, and a fireproof curtain will divide the auditorium from the stage. The latter has a depth from the curtain line of 50 ft. The artistes' dressing-rooms will be situated in a separate block of buildings entirely shut off from the other portions of the buildings.

THE CORDWAINERS' HALL, CANNON-STREET.—The Hall of the Cordwainers' Co., one of the most ancient of the City guilds—the Cordwainers being named from their trade in Cordovan leather, which was manufactured in Cordova in Spain—which is situated on the north side of Cannon-street, has, during the last few months had extensive decorative works executed to it. The internal decorations of the large hall on the first floor, and the lower hall and court room on the ground floor, were originally executed in the Adam style, but beyond simple friezes, the walls and ceilings were left with plain surfaces. The Court have long felt that rooms of such good proportions required more decoration to complete them, and during the recent vacation they have had the lower hall and the court room ceilings decorated with Adam plaster work, and have had a series of oval medallions fixed to the walls, thus breaking up their bareness underneath the enriched frieze which already existed. An Adam dado has been fixed in enriched material round the two rooms, and the whole of the rooms have been decorated throughout in a rich buff colour, relieved and picked out with gold. Both the new ceilings have also been gilded in their enriched portions, and care has been taken that the rooms shall be effective not only in daylight but in artificial light, under which they are largely used. The ceilings have been supplied and fixed by Messrs. Jackson & Sons, of Rathbone-place, the painting and gilding works being executed by Messrs. Colls & Sons, of Coleman-street. The whole of the works were designed and have been carried out under the personal directions of Mr. Howard Chatfeild Clarke, of Bishopsgate-street Within, the Co.'s Surveyor.

NEW ROMAN CATHOLIC CHURCH, CASTLEBAR, IRELAND.—This church has recently been dedicated by the Archbishop of Tuam. In regard to the interior decoration of the church, a principal feature is the stained glass windows by Mayer & Co., of Munich. First to be noticed is the five-light sanctuary window, nearly 30 ft. high, which is divided into three tiers of subjects, representing in the upper row the five Joyful Mysteries of the Rosary, in the centre row the Sorrowful Mysteries, and in the lower the Glorious Mysteries. This work has been presented by the Archbishop of Tuam. There are three-light side altar windows, representing the Apparition of the Sacred Heart to Blessed Margaret Mary and St. Dominic receiving the Rosary. In addition there are three nave windows of two lights each, illustrating the Wedding at Canaan, St. John Baptist de la Salle teaching, and the Raising of Jairus' Daughter. The Stations of the Cross were supplied also by Messrs. Mayer & Co. They are bold reliefs, almost full figures, in massive carved oak frames, over 6 ft. high and nearly 4 ft. wide. The gates in the Communion rail are of wrought brass, with battlements on the capping. One of the most effective ornaments in the church is the hanging lamp before the high altar. It is 8 ft. high and 3 ft. in diameter at the widest part. The top is formed of a very finely wrought Imperial crown, richly foliated, from which depend the chains, which are relieved with enamelled Gothic shields. From the corona, which is divided into six semi-circular panels and beaten in repousse, project pedestals enriched with foliated caps, upon which are mounted six angels with extended wings. From the junction of the panels project six candle-holders carrying the chains. The lower portion of the lamp, which contains the glass for oil, is of circular form, and is worked of wrought trellis, with a crown and pedestal finely worked in repousse. The side lamps are also of brass. The lamps and gates were manufactured in the workshops of Kane and Gunning, of Dublin. The heating was by Messrs. Musgrave, of Belfast; Messrs. Ward and Partners, of Belfast, supplied some leaded lights, while Messrs. James Pearse & Sons, Dublin, supplied the three altars. Mr. J. F. Ebner did the woodblock floors throughout; T. and C. Martin the seats. The general contractor was Mr. T. B. Healy, of Tralee. The contractor for organ gallery and carving was Mr. J. A. O'Connell, of Cork. Mr. William O'Connell, also of Cork, made the entrance screens and some of the seating. Mr. Andrew Cullen, of New Ross, the richly carved confessionals; Messrs. Kane and Gunning, of Dublin, supplied the elaborate solid wrought brass gates to the sanctuary and chapels, and a wrought brass corona for the chancel. Messrs. John Fagan & Sons, of Dublin, the wrought iron-work and lightning conductors. The tiling of the church and chapels is by Messrs. Craven, Dunne & Company. The tiling of the northern baptistry is by Mr. J. C. Edwards. The architect was Mr. Walter G. Doolin, of Dublin.

NEW CHURCH, GLASGOW.—The memorial stone of a church in Glasgow was recently laid by Mr. John Wilson, of Govan. The new building is situated at the corner of Dalmarnock-road and Harvie-street, the principal entrance being from the former thoroughfare. Space has been left in the rear for hall and vestry accommodation. The total sittings provided for are 605, and the church is to be electrically lighted. Mr. J. C. M'Kellar, of Glasgow, is the architect.

CHURCH SCHOOLS, WOLVERHAMPTON.—These schools, now in progress, have been designed by Mr. Fred. T. Beck, architect, of Wolverhampton. Accommodation will be provided for the instruction of 310 girls and 350 boys. The girls will be located on the ground floor, and the boys on the first floor. A separate one-story building will provide accommodation for 190 infants. The principal rooms in the boys' and girls' schools will be 93 ft. long by 22 ft. wide, and will be divisible into three sections by means of glazed folding screens. There will also be classrooms, a teachers' room, hat and coat rooms, and lavatories for each department, the whole of these being under supervision from the main room. Both stores and caretaker's quarters are also provided. The chief infant school will be of the dimensions of 43 ft. by 24 ft., also divided by a glazed screen, while separate classrooms and rooms for boys will be provided. The buildings will be constructed of brick, with red terra-cotta window sills, simple in character and finished with Hollington stone dressings. The roofs will be covered with Staffordshire tiles, and the rooms on the ground floor with wooden blocks, those on the first floor being boarded. All the departments and rooms will be heated by means of open fireplaces, assisted by hot-water apparatus. The staircases are to be of concrete. An emergency staircase is also to be constructed. The cost of the work is about 6,000*l.*, and the schools are expected to be completed by next June. The builders are Messrs. H. Willcock & Co., of Wolverhampton.

BUILDING WORKS, RADCLIFFE OBSERVATORY, OXFORD.—At the Radcliffe Observatory during the year important works have been in progress. The great dome under which the new telescope is to stand has been finished, and the internal fittings of the new tower have been considerably advanced. The steel girders of the lifting-floor of 26 ft. in diameter have been mounted, the roller and rails to guide its motion have been placed in position, and the water main to supply the hydraulic power for raising and lowering the flood has been laid down. The telescope itself, which will be one of the finest photographic instruments in the world, is now practically finished in Sir Howard Grubb's workshops in Dublin, and the work of erecting it at Oxford will very shortly commence. Nor have the older buildings been neglected. For many months past a great scaffold has encircled the old tower built by Wyatt (1772-1705), rising to a height of about 100 ft. above the ground. The upper part of this tower, which is modelled upon the Tower of the Winds at Athens, is of a very ornamental character, and at the very top is decorated with huge figures representing the eight winds. Being built of Windrush and Bibury stone, however, a great many of the more boldly carved features had perished, especially the capitals of the handsome Corinthian columns by which the great windows are flanked. All these parts are being thoroughly restored. The work is being carried out by Messrs. Wyatt & Son, of this city. The architect is Mr. T. G. Jackson.

NEW POLICE AND FIRE STATIONS, CAMBRIDGE.—These buildings, erected on the site of the old police-station and spinning-house, were recently opened. The construction as a whole covers the requirements of a police-station and fire brigade-station, the latter being south of the former. The police-station has a pair of oak doors surmounted by a fine stone carving of the Borough Arms, the work of Mr. Frampton, sculptor. The entrance-hall has a groined ceiling and mosaic floor. On the right through an oak lobby are the inquiry office; the chargeroom adjoins, and communication is afforded by means of a hatchway. Both rooms are embellished with an oak dado to a height of about 4 ft. A portion of the chargeroom is set apart for clerical purposes, and a window on one side commands the cell corridor running off to the rear of the building. Down the corridor are the cells, ten in number, six for males, three for females, and a reception-cell, fitted with a bath for medical treatment, the last-named being nearest the chargeroom. On the right are the lavatories. In the basement, under the cells, is a heating-room which warms them, and where constables may dry their clothes or prepare refreshments. Here there is also accommodation for Morris tube practice, target and appliances having been provided by the Chief Constable. In continuation of the cell block are the quarters of the female warder and rooms for single constables. The former comprises kitchen, living-room, three bedrooms, and offices. Access is obtained by means of a door opening into the cell corridor. At the extreme end of the corridor is a mortuary in the door of which it is proposed to insert a small circular window, through which jurors may view the body without going inside the room. Here is also a room for holding inquests. Near the main entrance is a large staircase leading to the upper apartments, which is one of the principal features of the building. Like the lobby it is constructed of Bath stone, with stone balustrading, surmounted by a richly-carved newel, the foundation of a hammered brass standard electric light. The staircase is lighted by a fine circular bay window, whilst at the top of the landing is a second bay window of stained glass, facing the street, containing the arms of England, of the Borough, of the university, and of the various Cambridge Colleges. This work was executed by Messrs. Weyer, of Norwich. Opening on the landing, and approached by a handsome oak lobby, is a spacious Watch Committee-room, which is panelled with oak up to about 8 ft. or 9 ft. It possesses a massive chimneypiece, elaborately carved, and over which is a convex mirror. Above the panelling the walls are stone-faced, and there is a moulded plaster Renaissance ceiling. The floor is of oak, and the room is lighted by means of four pairs of windows. In connexion with the room there is a private office and lavatory accommodation. The entrance hall communicates by a door at the back with a large covered-in court-yard, being flanked at one side by the cell portion of the building, on the other by the police quarters, and at the rear by the Chief Constable's house. The courtyard is adapted for a drill yard, and is covered with a glass roof. On the left of this is a block containing on the ground floor the parade-room, and over it at one end the lecture-room and recreation-room; at the other end is a messroom. The new offices provided for the Chief Constable in connexion with the house occupy a portion of this part of the site reaching to Downing-place. The only other rooms in the police-station are the clerk's office, waiting-room, and general storeroom, on the right of the first-floor landing. The first two named are about 12 ft. square, and the storeroom extends over both rooms. At the south end of the site is the fire-station, access to which is obtained by means of a bold semi-circular arched doorway, fitted with folding doors. The fire station, which has a wood-block flooring, is 30 ft. by 24 ft. and affords accommodation for a steam fire-engine and any equipment the town may require for its brigade. Upon entry, on the left is the watch room, in telephonic communication with all the call-posts in the town. Through the station is an open yard, to be used for cleaning and repairing purposes, and measuring some 30 ft. by 20 ft. It is paved with granolithic, and is provided with a hose hoist. At the rear of the yard is a muster room 20 ft. by 16 ft. and 12 ft. high. It has a wood-block floor, and is adorned by a wood dado about 4 ft. from the ground. This completes the ground floor, and the first and second stories contain the quarters of the foreman fireman. Both stations are furnished with electric light, electric bells, and telephones, the installation having been carried out by Messrs. Baily, Grundy, & Barrett, Limited, of Cambridge. The architect of the buildings is Mr. John Morley, of Cambridge.

SANITARY AND ENGINEERING NEWS.

MELTHAM SEWERAGE.—A Local Government Board inquiry was recently held by Colonel A. E. Durnford, R.E., into an application of the Meltham Urban District Council for consent to deviate from the chemical purification scheme of sewage treatment for which a loan was sanctioned in 1899. It was stated by the Council's Solicitor, Mr. F. A. Reed, that the scheme previously sanctioned consisted of chemical precipitation followed by artificial filtration and subsequent land filtration, but the Council now desired to substitute in place of that the Polarite bacterial oxidation system, which would be more suitable for the requirements of the district than the scheme previously sanctioned, whilst the advantages to be obtained from it, in addition to greater efficiency, were that the use of chemicals would be dispensed with, the works would be automatic, and there would therefore be a considerable saving in labour. Mr. J. B. Abbey, of Messrs. Abbey & Son, of Huddersfield, the Engineers to the Council, produced the plans of the proposed works and described the system, which briefly consists in passing the sewage through a screening tank, and then into three detritus tanks, where the organic solids will become split up and disintegrated by the liquefying action of the bacteria present. From the detritus tank the sewage enters three anaerobic bacteria beds, the effluent from which will flow along aërating channels, and then be sprinkled by means of Candy-Caink automatic revolving sprinklers fed by automatic intermitters on to Polarite bacterial oxidation beds. These beds have a com-

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bined area of 504 square yards with a working depth of 3 ft. 6 in., and will deal with 240,000 gallons of sewage per day. The advantage of delivering comparatively small quantities on the beds with short intervals of rest (which is accomplished by means of the Candy patent intermitters and automatic revolving sprinklers) is that a more complete aëration of the effluent as well as filter bed is obtained, and consequently a higher degree of purification, than by thoroughly deluging the beds and giving longer intervals of rest. Experience has also proved that better results are obtained by sprinkling than by either continuous distribution or ordinary contact beds. Mr. Candy, of the International Purification Syndicate, who was called to give evidence with regard to the Polarite oxidation beds and the working of the patent intermitters and sprinklers, stated in reply to inquiries that there were no royalties in connexion with the use of the system, which was being extensively adopted in various parts of the country as well as abroad. Dr. Wilson, Chief Inspector of the West Riding Rivers Board, was in attendance, and expressed the opinion that this was one of the most complete schemes he had seen submitted by any District Council, and urged that the work should be put in hand forthwith, the intercepting sewers having already been completed.

PROGRESS OF THE BIRMINGHAM NEW WATERWORKS.—The water committee of the Birmingham Corporation have recently made a report on the progress made in the Welsh Water scheme. Also, they state that in regard to the present supply the total consumption during the half-year, to September 30, shows a considerable increase over the corresponding period of 1900, having averaged 192 million gallons per day against 181 million gallons last year. The maximum day this year showed a consumption of 24,297,000 gallons against 23,588,000 gallons last year. With the exception of a few days at the end of July, when there was shortage in some districts, the supply has been well maintained throughout the summer. The rainfall, although considerably below that of last year in total, has nevertheless been well distributed, there having been no prolonged drought throughout the summer. Turning to the Elan Valley (Welsh) supply the committee give figures which show that the following purchases of land have been made:—Freeholds, 10,324 acres; common and exclusive rights, 24,587; mineral or mining rights, 5,879; manorial rights, 36,903. Good progress has been made during the summer with the works in the Elan Valley, and on the various sections of the aqueduct, also at Frankley, and in connexion with the laying of the distribution mains, but in the cases previously referred to, in which the work is behind time, the arrears have not yet been made up. The committee defer giving exact particulars as to progress until the reports to the end of the season have been received. By the Corporation Water Act of 1892 the time fixed for the completion of the works in the first instalment is ten years from the passing of the Act, which will expire on June 27, 1902. It will be impossible to complete all of the works by that date, and it will therefore be necessary to apply to Parliament for an extension of time. The Committee accordingly propose that the Corporation shall promote a Bill in the 1902 Session of Parliament to obtain such extension of time, together with a corresponding postponement of the sinking fund in respect of the capital raised under the 1892 Act. They further propose that advantage shall be taken of the occasion to obtain Parliamentary sanction to the abandonment of certain works found to be unnecessary, and the substitution of others to replace in certain cases, none of the variations proposed being in themselves important.

NEW BRIDGE, NEAR EDINBURGH.—The new "Shank" bridge on the main road from Newton-loan to the Shank at Armiston has now been completed. It has been erected on the site of an old bridge, and it was found by the engineers that the piers of the latter, which are very massive, could be repaired, and it was therefore decided only to take down the arches to the springing level, and to erect braced stools upon them for carrying the girders. These stools are about 28 ft. high, and are formed of four rectangular columns braced together and bolted to granite-bearing stones built into the piers, which have been thoroughly repaired. A bearing girder is fixed on the top of each stool, on which the longitudinal girders rest. The superstructure consists of two longitudinal plate girders, on the top of which trough flooring is laid, and there is a lattice parapet on each side. Cement concrete is laid in and over this troughing, and the roadway is formed of tar macadam, with tar paving on the footway. Cast-iron pilasters are placed over each pier, and castellated masonry pilasters on the abutments at either end of the bridge. The spans of the girders are about 47 ft., and the width of the bridge is 28 ft. between the parapets, divided into a roadway 20 ft. wide, with a footpath on one side 6 ft. wide and a cess of 2 ft. on the other side. The total length of the new bridge is about 320 ft., and the roadway is upwards of 60 ft. above the channel of the Gore Water. Messrs. Findlay & Co., of Motherwell, in conjunction with the engineers, Messrs. Crouch & Hogg, of Glasgow, were responsible for carrying through the work. The subcontract for the removal of the old bridge and the erection of the new masonry was placed with Mr. Stephen Hair, builder, Dalkeith, and the tar macadam and paving were done by Messrs. W. Walker & Sons, Leith and Ayr.

STAINED GLASS AND DECORATION.

ST. ANDREW'S ROMAN CATHOLIC CHURCH, BRAEMAR, N.B.—This church is about to be greatly improved and renovated. The work, which will take more than six months to execute, has already been begun, a number of stained windows having been inserted. The window at the end of the church, behind the altar, is a three lancet one. The centre light consists of Christ Crucified, with the Blessed Virgin and St. John, illustrating the text, "There stood by the Cross of Jesus his mother and the disciple whom Jesus loved." The light on the left is St. Andrew, the patron saint of the church. The figure is drawn from a photograph of the banner taken by the Scotch pilgrims to Lourdes in 1899. In the background to the right is a view of the Cathedral of Iona, and on the left St. Oran's Chapel. The light on the right represents St. Margaret, patroness of Scotland, and is taken from an altar piece in the Scots College, Rome, painted by a Polish artist. The saint is represented in prayer to the Holy Trinity. In the background is to be seen a view of the Battle of Alnwick, where were killed her husband, Malcolm Canmore, and her son. The two side windows in the sanctuary represent two Scotch saints—St. Columba and St. Ninian—and they are also from a painting in Rome by Seitz, an artist of the school of Overbeck. The whole of the work was executed by Mr. Louis Grosse, Bruges, Belgium, and of the firm of Louis Grosse, London. The emblems of Scotland—the thistle and crown—are delicately interwoven into the robes of the national saints. Other improvements are to be effected in the sanctuary, which is to have a new altar and surroundings, all of oak. The porch is to be laid with mosaic, representing the figure of St. Andrew in the centre, and between that and the outer border the Scotch thistle will be depicted. The passages will be laid in coloured tiles.

MEMORIAL WINDOW, ST. LUKE'S CHURCH, ISLINGTON.—On the 18th inst. a stained glass memorial window was unveiled in this parish church. The window, which is in the south-east corner of the church, represents St. James, and underneath is a suitable inscription to the memory of the late rector of the parish. The work was executed by Messrs. Jones & Willis, of Great Russell-street, Bloomsbury.

FOREIGN.

FRANCE.—M. Edouard Lecœur has been elected President of the Société des Architectes of the Seine for the ensuing Session.——The new Hôtel de Ville at Tours, the work of M. Laloux, is nearly finished, and will be opened next year. It has cost nearly 3,000,000 fr. without counting the artistic decoration, which is to be done at the cost of the State. The principal façade fronts the Place du Palais de Justice. It is decorated with sculptured caryatides by M. Sicard. The base of the campanile is adorned with two figures representing the Loire and the Cher, the work of M. Injalbert. Four figures by M. Cordonnier and M. Hugues, seated on the pediments of the gables, represent "Force," "Glory," "Science," and "Vigilance." Internally, the grand vestibule is decorated with four statues representing four celebrities of Touraine, viz., Cardinal Brissonnet, the painter Jean Foucquet, Maréchal Boucicaut, and Paul Louis Courrier. The Salle des Fêtes has two monumental chimney-pieces executed by M. Varenne, surmounted by two busts, by M. Injalbert and M. Loiseau Bailly, which represent "The Republic" and "Touraine." M. Schommar has been commissioned to paint the ceiling of this large room, and in the salle-à-manger will be placed eight compositions commissioned from two painters, MM. Eugène Thirion and Cormon. A triptych by M. Jean Paul Laurens will decorate the council-room, and the decoration of the committee rooms and the Mayor's parlour has been entrusted to M. Henri Martin. Considering all this exceptional talent engaged on the decoration of a building, designed under an architect of such remarkable acquirements as M. Laloux, it can be readily understood that the new town hall of Tours is no unimportant addition to modern French art.——There are to be important public improvements carried out in the town of Constantine, at an expenditure of a million and a half of francs; including the completion of the Hôtel de Ville.

INDIA.—The railway from Calicut to Cannanore has been completed and will shortly be opened for traffic.——The water supply to Rangoon has been considerably augmented by the sinking of two tube wells, which yield freely.——The extension works on the Nilgiri railway from Coonoor to Ootacamund have been commenced.——Traffic has been much interrupted on a portion of the Burma Railway from Mandalay to Kunlon by the destruction of a bridge between Sedaw and Tanbo by floods.——In regard to the Northern Railway of Ceylon, we learn that the laying of rails has been carried for several miles beyond Jaffna, and the ballasting has been done as far as Innuville.——The Brush Co. are preparing to take over the Bombay tramway system and to convert it to electric traction.——The Viceroy contemplates placing a tablet or device, with a suitable inscription, on old houses in Calcutta which have historical associations.

GERMANY.—It is anticipated that the monuments to be erected to the memory of the late Emperor and Empress Frederick in front of the Brandenburg Gate will be unveiled next October. The Empress Frederick will be represented in her coronation robes, and with the crown on her head. Herr Fritz Gerth, the sculptor, is now, or has lately been, in Berlin in order to discuss the plans with Herr Ihne, the Court Architect. The Emperor has decided that busts of Herr Eduard Zeller, the historian, and August Wilhelm von Hofmann, the eminent chemist, shall be placed at the foot of his mother's statue.—— The Emperor Frederick's monument, by Herr Brütt, is nearly finished. He is represented in the uniform of his consort's Cuirassiers. The pedestal of this statue will be adorned with busts of Professor Helmholtz and Field-Marshal Count Blumenthal.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Howgate & Keith, architects and surveyors, have removed their offices from 70, Gower-street to 10, Sackville-street, Piccadilly, W.——Mr. J. R. Elliott, Civil Engineer, Nottingham, has removed to Burton Buildings, Parliament-street, Nottingham.

WORKHOUSE EXTENSION, GRIMSBY.—Messrs. Shorland ask us to mention that in the above-named building, described in our last issue, the wards are warmed and ventilated by means of their Manchester stoves.

NO. 2, PALACE-GREEN, KENSINGTON.—The Crown lease of this house, with some freehold garden ground at the back, will be offered for sale at auction in the course of next month. It stands on the west side, at the south end of the road, formerly Queen's-road, through Kensington Palace-gardens, and is the house, though somewhat altered since, which Thackeray built for his own occupation. He, it is said, made a scheme for the general plan and design. Thackeray removed thither from No. 36, Onslow-square, South Kensington, in 1862, and there he died on Christmas Eve of the following year.

ANCIENT TRADE REGULATIONS AT BEVERLEY.—A report which has just been issued by the Historical Manuscripts Commission on the Manuscripts of the Corporation of Beverley contains many curious and informing extracts from the ordinances in force in the ancient Yorkshire town in the middle of the fifteenth century. Some of them concern individual trades. Here are a few specimens:—No carpenter or tiler (viz., "tilethakker, tilewaller, and plasterer"), who has not a regular apprentice who works with him, to employ a journeyman without the consent of the master of the works with whom he works, and the latter may employ any journeyman he pleases, and finish a job begun by one with another. Carpenters, tilers, and their servants, sawyers, paviours, and their servants and workmen, shall observe these hours:—From Easter to the Assumption (August 15) from 4 a.m. to 7 p.m., with an interval at 6 a.m. of quarter of an hour to drink; at 8 a.m. of one hour for breakfast; at 11 a.m. of one hour and a half to dine and sleep; at 3 p.m. half an hour to drink; otherwise they shall not be tardy, or absent from their work, on pain of 12d. to the community. From the Assumption to Easter they shall begin at daybreak, and leave off when the light fails. At this season they may have at 9 a.m. half an hour to drink or breakfast; 12 noon, one hour to eat; 3 p.m., quarter of an hour to drink. No carpenter, &c., shall refuse to work with any burgess who wants him unless previously engaged on some other work; penalty, 6s. 8d. On account of the stink, fouling of the air, and destruction of fruit trees, none to make a kiln ("thorale") to burn bricks ("tegularem") in or nearer the said town than the kilns are now built; penalty, 100s.

TIMBER EXPORTS FROM THE WHITE SEA.—A report received by the Foreign Office from Sir Capel Wolseley, British Vice-Consul at Archangel, supplements in some respects the more elaborate review of the Russian timber trade sent recently by Mr. Consul Woodhouse from Riga, as already noticed in the *Builder*. Sir C. Wolseley states that the export of timber from all the ports of the White Sea amounted last year to 10,323,085 roubles (1,098,200*l.*), being 2,000,000 roubles in excess of the previous year. The vast forests of the Province of Archangel are its most valuable commercial asset and the principal source of the prosperity of its ports. With occasional fluctuations, the development of the timber trade has been steady and rapid. Between 1862 and 1880 the export nearly doubled in the course of each decade. During the next ten years the increase was about 70 per cent. The export of 1900 was nearly twice that of 1891. Since 1898, which showed a slight decrease as compared with the previous year, the advance has been at the rate of about 200,000 standard dozens yearly, while the increase of value was about 140,000*l.* in 1899 and over 210,000*l.* in 1900,

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the total amount of timber exported in that year being 1,239,068 standards, valued at 1,098,200*l*. The exceptionally high prices obtained for sawn timber in 1899 still continued to prevail last year. The logs having been bought at moderate rates, large profits ensued for the saw-mill owners. A result of this access of prosperity was to cause some owners to start new mills and to bring competitors into the field. The new mills comprise two at Archangel, two at Kovda, one at Umba, one in the Petchora district, and two small ventures inland near the line of the Moscow-Yaroslav-Archangel Railway. Another effect of the two years' run of prosperity was to increase the price of logs. The Russian Government, to whom all the forests belong, only offer a limited number of trees for sale by auction each year. Last year, buyers, anticipating a continuation of the larger demand for sawn goods, strove to outbid each other in order to obtain the greatest number possible of the available trees, the result being that unprecedentedly high prices were paid. As the timber is generally allowed to lie two years in order to become seasoned, the result of this high rate of purchase will not be felt till 1902, when, unless the market improves, it appears inevitable that many owners will suffer loss.

THE MERWARTH METALLIC GASKET.—Gaskets, or joint rings for flanged pipes and unions, are sufficiently familiar to architects and engineers, and of late years the tendency has been towards the employment of metal as the most efficient and serviceable material. The "Merwarth" ring is of somewhat novel construction, consisting of a soft metal ring of $\frac{1}{8}$-in. diameter wire, outside which is soldered a concentric copper ring of $\frac{1}{16}$-in. diameter wire, and to the copper ring short pieces of thinner wire are attached, which can be wound round the bolts for the purpose of holding the gasket in the proper position for making a joint. No doubt in very accurate work there is nothing better than a "metal-to-metal" joint, but in the case of ordinary pipes the flanges always present irregularities, even when machine-faced, and the use of some compressible yet durable material is always necessary. The device with which we are now concerned appears to be a good one, for the inner ring of metal being ductile, is readily squeezed into all the irregularities of the flange surfaces, and thus forms a perfectly tight joint, preventing the leakage of liquid, vapour, or gas, and being reinforced by the outer ring of copper it is capable of resisting injury from expansion, contraction, and vibration. The gaskets are made up to 60 in. in diameter, and it is claimed for them that efficiency increases in direct proportion to the diameter. This is an unusual condition, and one of which we cannot yet speak from practical experience. Other clear advantages are that the rings do not deteriorate and can be used over and over again, whilst they can be removed and replaced in a minimum space of time.

CENTRAL SCHOOL FOR THE BLIND IN LONDON.—A scheme is under consideration for the establishment of a Central School for the Blind in London. Although provincial cities were the first to undertake the instruction of children thus afflicted, the Metropolis subsequently took the lead, and a comprehensive and systematic plan was prepared by the School Board. The blind children attend the schools, but receive special instruction, given by a superintendent and several teachers trained at the Royal Normal College for the Blind. The proposed central school is situated at Bolingbroke-grove, Wandsworth Common, and correspondence on the subject has been passing between the School Board and the Education Department. Some alterations are required on the premises, which are known as Linden Lodge, and when these are completed the Department has undertaken to grant a permanent certificate.—*Daily Telegraph.*

NEW CHURCH FOR SOUTH KENSINGTON.—The Ecclesiastical Commissioners have decreed the union of the two contiguous benefices of All Saints and Holy Trinity, Knightsbridge, and the demolition of the latter church, together with the vicarage adjoining. The united benefices will in future be served by the Church of All Saints, in Ennismore-gardens, which was erected some fifty years ago, and subsequently enlarged. The interior contains some decorative work by Owen Jones. In order that the spiritual needs of the district shall be fully supplied, it has been decided that a new church, together with a parsonage house, shall be built in Prince Consort-road, South Kensington, upon a site purchased from the Commissioners of the Great Exhibition. Mr. G. F. Bodley has been appointed to prepare the plans.—*Daily Graphic.*

GIGGLESWICK SCHOOL CHAPEL.—The Acme Wood Flooring Company ask us to mention that the wood-block flooring in the above-named chapel was laid by them, with the "Immovable-Acme" system of dovetailed blocks.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

11,429.—AN ELECTRO-MAGNET FOR USE IN LIFTING APPARATUS: *M. Vogelsang and F. Lindenstruth.*—An automatical switch and an electro-magnet are so combined that a strong current shall be firstly sent through the coil for starting the motion of the armature, after which the current will be weakened. An extension upon the core or armature, which is surrounded with the coil, will, concurrently with the attraction of the armature, move a switch lever in opposition to the action of a spring, and so effect the insertion of a resistance, which may be inserted either in series or parallel-wise to the coil.

11,438.—JOINTING CASES FOR ELECTRICAL CONDUCTORS: *Siemens Bros. & Co., W. Dieselhorst, and F. J. Budd.*—Two castings fitted together and secured with bolts and nuts constitute a casing for straight, T, or multiple joints. For the first-named the cable is gripped in the lower case or casting, and there are provided an air space for some low-melting-point insulating material, and channels for projections upon the upper casting. One of the channels takes a packing of strip lead, the other takes insulating material. The air holes and filling holes are to be closed with screws.

11,442. — PORTABLE BUILDINGS AND THEIR PARTS: *C. H. Rector.*—These structures, which are intended for use as hospitals and for military and other purposes, have foundation beams, rebated floor sections, wall and roof sections of composition board, and rafters and uprights of T or double-angle iron. Scarfed joints and interlocking lugs and slotted plates join sections of the beams together in line, the rafters being pivoted to triangular brace plates which are riveted to the uprights and are secured to the plates with slotted pins or bolts tightened and locked with slotted wedge plates sliding upon pins of the bolts; to the uprights and rafters are affixed inclined lugs for engagement with the slotted side bars of the frames that support the wall and roof boards; sockets on the king posts at the gable ends carry the brace plates of the end roof trusses, and transport is facilitated by the jointing of the ridge bar. At the ridge are triangular brace plates riveted to the rafters upon one side of the roof, upon the other side they are joined to the rafters with pivots and slotted bolts; pivoted catches or levers passed through slots in the uprights and inserted into inclined wedging-slots in the sash stiles fasten the windows between the uprights. The specification provides for dividing the building into rooms by means of partition plates.

11,453.—KILNS, OVENS, DRYING-FLOORS, &C.: *J. T. Cope.*—A series of hot-air, furnace-gas, or steam-flues or ducts having triangular sections that present a set of furrows, ridges, or corrugations, constitutes an open drying-floor, or the floor of an oven or kiln. The flues may be made in lengths, whereof each is either in one piece or built up with tiles or plates, or they may be formed of some woven material upon ribs or frames. In one shape the flue is made of pierced tiles and is open at the base; clamps or shoes support its lower ends, and pierced filling-pieces lie in the furrow angles, the tiles interlocking at the ridge-tops.

11,510.—SIPHONICAL DISCHARGE: *E. Grube & H. C. M. Sanny.*—To a bell-siphon is attached the open-bottomed float of the supply-cock. When the pull-chain is pulled the float will be pressed downwards until the water overflows for the starting of the siphon. The inventors also contrive that the float shall act as a piston.

11,515.—A PARALLEL RULER: *D. T. Stokes.*—In the body of the ruler are openings in which is fit a shaft mounted with rollers, and a bevelled ruler (to which a combined folding square and protractor may be attached) runs upon the rollers, a spring catch controls the extent of the movement of the ruler between the ruled lines, and the catch is to be moved along a spindle into gear with one of a row of teeth or grooves upon a boss. For use with papers, &c., that have different widths, one roller, or both of them, can be adjusted upon the shaft by means of a spring click in the roller that will engage with scallops cut in the shaft. The rollers are made of side-plates drawn together with a screw-hub upon their middle rubber portions.

11,523.—AN EXHAUST VENTILATING-SHAFT TOP: *J. R. Arnoldi.*—An open-ended draught-tube is placed within a passage which is affixed at 90 deg. to the up-take. The tube and the passage may be flared or may have one continued diameter, and the former will extend from one end of the passage to beyond the opening of the up-take. The draught-tube is lipped, and inside the passage is disposed transversely a raised ridge, groove, or ring for preventing the entrance of rain by the up-take. In another form the passage and tube are set upon a vertical spindle that they may be turned by the wind.

11,543.—DOMESTIC HEARTHS: *W. L. Dennis.*—The hearths consist of enamelled and embossed metallic plates secured on asbestos or other non-conducting pads; their corners are closely pierced in order that portions may be cut off them so as to fit the stove without injury to the enamel. The plate may be fashioned with extensions to be bent so as to make a combined hearth-plate and curb, or it may be affixed on to a fender or curb.

11,553.—LOCKS: *P. Stephens.*—Between the door and the lock is a recess for a plate on which slides another plate that closes the outside keyhole: the latter plate is maintained in its position by means of a bail which is pivoted on to the knob and abuts against the turned-up part of the covering-plate, and it may be caused to slide into its place, when the key is in the lock on the inside of the door, by means of a groove that is cut in its middle.

11,569.—PROCESS OF MOULDING BRICKS: *J. S. Pullan and W. H. Mann.*—A loose cutting ring or frame is fitted on to the feeding-hopper of the machine specified in No. 935 of 1896; its bevelled cutting edge will be pressed downwards against the mould or table by the pressure of the clay; close contact of the cutter against the table is brought about by its being forced down automatically as the underside is worn away.

11,594. — A HAND-TOOL FOR SETTING THE TEETH OF SAWS: *H. U. Kistner.*—Two jaws hold the saw which a gauge adjusts lengthwise; when the handles of one of the jaws are pressed together the jaw will be pressed against the saw, and then punches are forced against the opposite sides of the teeth. A pivoted lever, together with a curved lever, a link, a spring, and a third lever effect the working of the handles upon the jaw, and the pressure is extended to the punches which are joined to the opposite sides of a fulcrum. For saw-jointing purposes a screw is drawn back for the insertion of the saw, and a file is operated within a recess.

11,606.—A LIFT VALVE: *G. O. H. Klopp and Klopp's Patents, Limited.*—For a cock or tap wherein the fluid pressure from below presses a ball-valve against a seating-ring, a ring which is fashioned in one piece with a sleeve keeps the seat in its position, and its turning is prevented by means of a side-lug that engages with a groove in the casing, in which it is held with a cap; water will escape through a channel and a port in the casing and the sleeve, and a rib in the bib or outlet obviates spraying. Confer also No. 8,386 of 1898 for the cock or tap cited.

11,609-10.—PROTECTIVE CONTRIVANCES FOR USE WITH ELECTRICAL CIRCUITS AND SYSTEMS: *P. H. Thomas.*—In order to prevent damage by excessive static potential, the inventor connects the leads of a system with lightning-arresters, which are set in series with earthed impedances; one shunting impedance, or more, can be used in each of the arresters, which consist of a series of spark-gaps variously unshunted, or shunted with impedances. No. 11,610 specifies a system of which the generator has impedances in the leads, condensers, and lightning-arresters that are bridged across the leads and connected to earth. For protecting the transformer from a rise in potential occasioned when the switches are opened are provided impedances and condensers bridged across the leads and connected to the transformer core. For a direct-current system it will be necessary to protect one side only with the impedance and arrester.

11,632.—A SEWAGE STRAINER OR SCREEN: *S. H. Adams.*—A flap is provided for a basket-shaped strainer or screen for the collection of the separated solid matters. The flap can be pulled upwards with chains so as to leave the solid matters in the basket, which also is to be lifted up for the removal of its contents, a screen being then lowered into the place of the basket.

11,638.—CHIMNEY-TOPS: *A. Z. Germains.*—The inventor's object is to supply a chimney-top for use with furnaces in order to save fuel and consume smoke. Between the two parts (covered with a hood) which constitute the upper portion of the top, is a perforated ring-damper, which is worked with a lever and a chain; a set of small rotatory fans are disposed around the upper part, a socket hangs from the lower part into the shaft beneath: the opening between the two portions is regulated with a sleeve to which a lever and a chain are attached. Confer also No. 315 of 1898.

11,666.—A METHOD OF SETTING-OUT CURVES: *H. Fischer.*—The instrument is devised for the setting-out of circular curves. It has a diametrical arm which carries slot-and-wire sights and is pivoted on to a graduated disc which has two fixed base-line sights. For setting-out a particular arc *a b*, one should firstly set out the diameter *a c* (of the circle) in both length and direction, then one should set up the instruments at the extremities *a* and *c*, with the base sights along *a c*, the diametrical arms being set to complementary angles; points along the curve *a b* will then be given by the intersection of the lines of sight.

11,798.—CONSTRUCTION OF BRICK AND OTHER KILNS, RETORT FURNACES, &C.: *E. Böttger.*—The arches are built up with hemispherical bricks at the two ends, segmental bricks at the vault, and recessed bricks, with it may be central key-stones at the crown.

11,852.—KILNS AND DRYING-FLOORS: *Meldrum Bros. and J. S. Orton.*—There are external furnaces in communication with flues beneath the floor, which latter should be constructed of removable slabs or tiles; two or more floors can be laid in series at different levels and be heated by one furnace or by separated furnaces. The invention concerns the manufacture of Parian cements, plaster of Paris, and barytes and china clay.

11,889.—A CONTRIVANCE FOR WORKING VALVES, COCKS, SWITCHES, &C., FROM A DISTANCE: *L. Feldmann and L. Korach.*—A cylinder, which contains a spiral spring, is mounted upon the casing of the pipe, a link joins a bell-crank lever to the valve-handle, its axis being in engagement with one end of the spring; the free end of the lever will engage with a catch upon a pivotted lever supporting a plate. When the former lever is turned through 90 deg. the plate acts as the armature of electro-magnets that are connected to a battery circuit.

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When the circuit is closed with a switch, the electro-magnets will attract the plate for release of the bell-crank lever to enable the spiral spring to return the valve to the closed position. A plate inscribed "closed" may be worked with a shunt circuit joined to an electro-magnet.

MEETINGS.

SATURDAY, OCTOBER 26.

The Builders' Foremen's Association (Memorial Hall, Farringdon-street).—7.30 p.m.

British Institute of Certified Carpenters.—Visit to St. Thomas' Hospital, Albert Embankment. 3 p.m.

TUESDAY, OCTOBER 29.

The Sanitary Institute.—Professor Henry Robinson, M.Inst.C.E., on "Sewage Disposal." Parkes' Museum. 7 p.m.

WEDNESDAY, OCTOBER 30.

Northern Architectural Association. — Students' Sketching Club, Winter Lectures, proposed Association Conversazione, 36, Northumberland-street, Newcastle-upon-Tyne. 7.30 p.m.

THURSDAY, OCTOBER 31.

Carpenters' Hall.—Professor T. Roger Smith on "The Supply, Distribution, and Use of Water in Buildings." 7.30 p.m.

The Sanitary Institute.—Professor Henry Robinson, M.Inst.C.E., on "Scavenging, Disposal of House Refuse." Parkes' Museum. 7 p.m.

FRIDAY, NOVEMBER 1.

Architectural Association. — Mr. A. Wood, M.A., F.S.A., on "Cambridge in Early and Mediæval Times." 7.30 p.m.

Institution of Junior Engineers.—Presidential address by Sir John Jackson F.R.S.E., Westminster Palace Hotel. 8 p.m.

Institution of Mechanical Engineers.—Adjourned discussion on the Second Gas Engine Research Report. 8 p.m.

SATURDAY, NOVEMBER 2.

British Institute of Certified Carpenters.—Adjourned discussion on Mr. Sweett's paper on "Modern Joinery." 6 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

October 8, 9, and 10.—By S. WALKER & SON (at Torquay).

Torquay, Devon.—Hesketh-cres., f.g r.'s 112*l.* 6s., reversion in 43¾ yrs. £4,100
Meadfoot-rd., f.g.r. 8*l.* 10s., reversion in 43 yrs. 390
Park-pl., &c., f.g.r.'s 36*l.* 9s. 6d., reversions from 19 to 42 yrs. 3,380
Hillside Cottages, &c., f.g.r. 5*l.* 2s., reversions in 59 and 66 yrs. 147
Tor Hill-rd., f.g.r.'s 29*l.* 17s., reversion in 36 yrs. 1,250
Bronshill-rd., &c., f.g.r.'s 105*l.* 17s., reversions from 20 to 89 yrs. 5,121
St. Mary's Church, &c., f.g.r. 22*l.* 6s., reversions from 11 to 64 yrs. 997
11, 12, 25, and 26, Torwood-st., u.t. 73 and 86 yrs, and subject to three lives 1,050
2 and 20, Victoria-parade, u.t. 83 and 87 yrs., and subject to three lives 775
1, Strand, u.t. 74 yrs., and subject to three lives 180
East-st., Rose Cottage, u.t. 77 yrs., and subject to three lives 120
East-st., a freehold building site 46
Upton, &c., 18 building sites, 7 a. 3 r. 22 p., f. 2,320
Higher Mount Hermon, &c., 14 building plots, 7 a. 2 r. 2 p., f. 2,000

October 14.—By HENRY HOLMES & CO.

Hampstead-rd.—30, Edward-st., u.t. 23 yrs., g.r. 8*l.*, r. 56*l.* 500

By HUGH SWORDER.

Epping, Essex. — Kendal-av., Gilstead and Elsternwick, f., r. 48*l.* 660

By G. A. WILKINSON & SON.

Hoxton.—63, Britannia-st., f. 360
Regent's Park.—47, York-ter., u.t. 19¾ yrs., g.r. 39*l.* 6s. 900
Chester-pl., i.g.r. 35*l.*, u.t. 23 yrs., g.r. 5*l.* 360
St. John's Wood.—Abbey-rd., &c., i.g.r. 30*l.*, u.t. 16 yrs., g.r. nil 200
Marylebone.—69, Marylebone-lane, f., r. 73*l.* 10s. 1,560
73, Marylebone-lane, f., r. 75*l.* 1,640

October 15.—By DANIEL WATNEY & SONS.

Goudhurst, Kent.—Finchurst and Monk's Farms, 113 a. 0 r. 3 p., f. 4,600
Two enclosures of land, 12 a. 1 r. 38 p., f. 380
A freehold house, cottage, and 8 a. 0 r. 4 p. 650

By ALFRED BEST & ADAMS.

Balham.—21, Cloudesdale-rd., u.t. 89 yrs., g.r. 6*l.* 10s., e.r. 40*l.* 405

By J. & W. JOHNSON & CO.

Enfield.—1 to 4, Fir Tree-villas, f. 1,150

By MIDDLETON & CRACKNELL.

Hampstead.—34, Heathurst-rd., u.t. 94 yrs., g.r. 12*l.* 5s., e.r. 75*l.* 855

By J. W. MORLEY & CO.

Putney.—100, High-st., f. 2,000
102, High-st., with building in rear, f., r. 80*l.* .. 3,000

By WESTON & SONS.

Brixton.—9, 11, 13, and 15, Probert-rd., u.t. 71 yrs., g.r. 21*l.* 1,325

By WM. WEATHERHEAD (at Skipton).

Scosthrop, Yorks.—Dykelands Farm, 271 a. 2 r. 10 p., f. 6,100
Scosthrop Hall Farm, 205 a. 0 r. 20 p., f. 4,550

By ALFRED RICHARDS (at Tottenham).

Tottenham.—1 and 2, Rose-cottages, f. 225
Edmonton.—9, Gloucester-rd., f. 290
Montagu-rd., a freehold building plot 78
Kenningham-rd., a freehold building plot..... 25

By BARKER, CATHIE, & FINCH (at Masons' Hall Tavern).

Whitstable, Kent.—High-st., the Bear and Key Hotel, f., with goodwill 6,700

October 16.—By BAXTER, PAYNE, & LEPPER.

Twyford, Bucks.—Charndon Great Wood and four enclosures, 254 a., f., with the manors of Twyford and Charndon £1,900

By FOSTER & CRANFIELD.

Kensington.—4 and 5, Alma-ter., u.t. 58¼ yrs., g.r. 15*l.*, r. 130*l.* 1,260

By HERRING, SON, & DAW.

Kentish Town.—4, 6, 7, 8, 9, and 11, Belmont-st., f., r. 248*l.* 2,980

By A. MARTIN NEWCOMBE.

Battersea.—Orkney-st., the Royal Albert Park Tavern, u.t. 61 yrs., g.r. 8*l.*, r. 50*l.* 1,470
43, 45, and 47, Chatham-st., f., r. 110*l.* 4s..... 1,800

By PROTHEROE & MORRIS.

Limehouse.—63, 64, and 67, Salmon-lane, and the Earl Cairns Mission Hall in rear, u.t. 22 yrs., g.r. 55*l.*, r. 133*l.* 420
Leytonstone.—51, Birkbeck-rd., f. 500

By DOUGLAS YOUNG & CO.

Wandsworth.—St. Ann's Hill, The Grove, f., r. 87*l.* 10s. 960
The Grove, Moulscombe House, f., r. 42*l.* 580
Deptford.—170 and 172, High-st., a building site, area 3,700 ft., let for 80 yrs., at per annum ... 35

By J. H. BRADWELL & SONS (at Nottingham).

Nether Broughton, Leicester.—A freehold farm, 108 a. 3 r. 14 p. 4,100
A freehold farm, 34 a. 3 r. 33 p. 1,900
A freehold homestead and 23 a. 0 r. 1 p. 1,100
Three freehold messuages and 10 a. 3 r. 22 p..... 800
Seven closes of pasture land, 31 a. 0 r. 1 p., f. .. 1,620
Freehold house, yard, &c. 170

By NOTT, CARTWRIGHT, & ETCHES (at Feltham).

Feltham, Middlesex.—Alfred-rd., 47 plots of freehold building land (in lots) 472

October 17.—By H. J. BLISS & SONS.

Old Ford.—4 to 22 (even), Wendon-st., u.t. 65 yrs., g.r. 40*l.* 1,720
Bethnal Green.—Moss-st., f.g.r. 3*l.*, reversion in 2¾ yrs. 420
Mile End.—26, Allas-rd., u.t. 63 yrs., g.r. 4*l.* 4s. 462

By C. RAWLEY CROSS & CO.

Shepherd's Bush.—126, Coningham-rd., u.t. 63 yrs., g.r. 7*l.* 13s., r. 40*l.* 395
25, 27, and 31, Sulgrave-rd., u.t. 73½ yrs, g.r. 19*l.* 10s., r. 105*l.* 1,205

By FAREBROTHER, ELLIS, & CO.

Whitton, Middlesex.—Nelson-rd., 5 freehold cottages, area 3 a. 1 r. 26 p., e.r. 90*l.* 1,515
Bloomsbury.—18, Woburn-sq., u.t. 27 yrs., g.r. 28*l.* 910

October 18.—By HARDS & BRADLY.

Catford.—49, Holbeach-rd., f., r. 27*l.* 475

By MARTIN, CLARKE & CO.

Feltham, Middlesex.—2, Grove-villas, f., r. 26*l.* .. 275

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 12 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 10 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts	1 14 6	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 6 6	,,	,, ,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 4 0	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
		s. d.	
Thames and Pit Sand		7 3	per yard, delivered.
Thames Ballast		6 0	,, ,,
Best Portland Cement		32 0	per ton, delivered.
Best Ground Blue Lias Lime		25 6	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt.

PRICES CURRENT (*Continued*).

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.	
Bath ,,	1 7	,, ,,	
Farleigh Down Bath	1 8	,, ,,	
Beer in blocks	1 6½	,, ,,	
Grinshill ,,	1 10	,, ,,	
Brown Portland in blocks	2 2	,, ,,	
Darley Dale in blocks	2 2½	,, ,,	
Red Corsehill ,,	2 5	,, ,,	
Red Mansfield ,,	2 4½	,, ,,	
Hard York in blocks	2 10	,, ,,	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt	
,, ,, 6 in. Rubbed Ditto	3 0	,, ,,	
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,	
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,	
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt	
,, ,, 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
,, ,, 3-in. do.	1 2½	,, ,,	

SLATES.

in. in.	£ s. d.		
20 × 10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.	
,, best seconds ,,	10 15 0	,, ,,	
16 × 8 best ,,	6 2 6	,, ,,	
20 × 10 best blue Portmadoc	10 18 0	,, ,,	
16 × 8 best blue Portmadoc	6 0 0	,, ,,	
20 × 10 best Eureka unfading green	11 2 6	,, ,,	
16 × 8 ,, ,,	6 15 0	,, ,,	
20 × 10 Permanent green	10 0 0	,, ,,	
16 × 8 ,, ,,	5 12 6	,, ,,	

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt	
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than best 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine— First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6

[*See also page 375.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Application to be in
*New Art School	Hull Corporation	100*l.*, 60*l.*, and 40*l.	Jan. 31
*New Buildings, and Laying-out and Fencing Field	Governors, Northampton School	25 guineas to second	No date
*Municipal Buildings	Stockport Corporation	Not stated	do.
*New Public Library	Kingston-on-Thames Corporation	Not stated	do.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Designs to be delivered
Raising Boundary Wall at Cardiff Infirmary		E. Seward, Architect, Queen-street, Cardiff	Oct. 28
Road Metal (900 tons)	Pontypridd U.D.C.	E. Rees, Surveyor, Council Offices, Pontypridd	do.
Three Shops, North-parade, Bradford		S. Jackson & Son, Architects, Tanfield Chambers, Bradford	do.
33 Houses, Abercwmboi, Wales	The Building Club	T. W Millar, Architect, Mountain Ash	do.
Additions to Laundry at Workhouse, Fulwood	Preston Guardians	Whitwell, Engineer, Union Offices, Preston	do.
Building at Pumping Station, Whitworth-street West	Manchester Corporation	Waterworks Engineer, Town Hall, Manchester	do.
Street Works, Grange-avenue, &c.	Harrogate Corporation	Borough Engineer, Town Hall, Harrogate	do.
Additions to Hospital, North Prospect	Devonport Town Council	Borough Surveyor, 30, Ker-street, Devonport	do.
Sewerage Works	Selby (Yorks) U.D.C.	B. McG. Gray, Civil Engineer, Town Hall, Selby	do.
Water Supply Works, Cairnbulg, Aberdeen	Deer District Committee	Jenkins & Marr, Civil Engineers, 16, Bridge-street, Aberdeen	do.
Car Shed and Boundary Wall, Caister-road	Great Yarmouth Corporation	J. W. Cockrill, Surveyor, Town Hall, Great Yarmouth	Oct. 29
Additions to Nurses' Home, Isleworth	Brentford Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	do.
Street Works, Folkestone-road	Dover Town Council	H. E. Stilgoe, Civil Engineer, Town Hall, Dover	do.
Sewerage Works	Mountain Ash U.D.C.	H. P. Linton, Town Hall, Mountain Ash	do.
Additions to Small-pox Hospital	Bedford Corporation	J. Lund, Borough Surveyor, Town Hall, Bedford	do.
Filter Beds, Ellastone, Staffs	Mayfield R.D.C.	J. Twemlow, Surveyor, Mayfield Grange, Ashbourn	do.
Sewage Disposal Works, Dipton	Annfield Plain U.D.C.	T. J. Trowsdale, Surveyor, Annfield Plain	do.
Street Works, Ely and Llandaff Yard	Llandaff & Dinas Powis R.D.C.	J. Holden, Civil Engineer, 35, St. Mary-street, Cardiff	do.
Building at Sewage Works, Woolfold	Tottington (Lancs) U.D.C.	L. Kenyon, Surveyor, 33, Chapel-street, Tottington	Oct. 30
Passage Works, Tattersall-road	Litherland (Lancs) U.D.C.	W. B. Garton, Surveyor, 25, Sefton-road, Litherland	do.
Museum, Winchester		Colson & Co., Architects, 45, Jewry-street, Winchester	do.
Additions at Workhouse, Crumpsall	Manchester Guardians	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	do.
Road Metal	Erdington (nr. Birmingham) U.D.C.	H. H. Humphries, Engineer, Public Hall, Erdington	do.
Church, Stonyhill, Blackpool		H. Goldsmith, Architect, 63, Faulkner-street, Manchester	do.
Road Works, Caburn-road and Rutland-gardens	Hove Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove	do.
Boundary Walls, Bowersdale Park, Seaforth	Waterloo (Lancs) U.D.C.	F. S. Yates, Civil Engineer, Town Hall, Waterloo	do.
Gates, &c., Sandheys Park		do.	do.
Additions to Schools, Bedford-road	Bootle (Lancs) School Board	T. Cox, Architect, 11, Dale-street, Liverpool	Oct. 31
Library, North-street	Keighley Corporation	Borough Engineer, Town Hall, Keighley	do.
Sewage Outfall Works, near Stockport	Bramhall U.D.C.	E. Sykes, Civil Engineer, 13, Warren-street, Stockport	do.
Shops, South Kirkby, near Wakefield	Colliery Company, Ltd.	Garside & Pennington, Architects, Ropergate, Pontefract	do.
Creamery, Low Bridge	Kilfinane (Ireland) Co-op. Dairy Soc.	J. C. Bennett, Kilfinane, co. Limerick	do.
Sanitary Fittings, &c., Middle Walk, North Shaw	Blackpool Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Additions to Market House, Market-street	Oxford Corporation	City Surveyor, Town Hall, Oxford	do.
Schoolroom, near Trevethin Church, Pontypool	Church Committee	T. Williams, Architect, Victoria-road, Pontypool	do.
Road Works, &c., Fergusson-road and others	East Barnet Valley U.D.C.	G. D. Byfield, Council Offices, Station-road, New Barnet	do.
Drainage Works, Hillingdon East	Uxbridge Guardians	Engineer, Corn Exchange, Uxbridge	do.
Well Sinking, High Hesket	Penrith R.D.C.	J. W. Smith, Council Offices, Penrith	do.
Water Supply Works	Knottingley U.D.C.	J. Richardson, Civil Engineer, East Parade Chambers, Leeds	do.
*Sorting Office for Postmen, Brockley	Commissioners of H.M. Works, &c.	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	do.
Outfall Sewer and Sea-wall, St. Aldan's-by-the-Sea	Lord Crewe's Trustees	F. H. Anson, Civil Engineer, 15, Dean's-yard, Westminster	Nov. 1
Laboratory at County School, Cardigan		J. Stephens, 3, Queen-street, Cardigan	do.
Chapels, &c., Ballycraigy	Larne (Ireland) U.D.C.	W. G. Young, Town Hall, Larne	Nov. 2
Additions to Schools, near Doncaster	Stainforth School Board	H. B. Thorpe, Architect, Goole	do.
Road Works, Chingford Green	Chingford U.D.C.	W. Stair, Surveyor, 14, The Parade, Chingford	do.
Sewerage Works	Cowbridge (Wales) R.D.C.	G. E. Morris, Civil Engineer, St. Quintins, Cowbridge	do.
Arching over the Beck, near Market	Dewsbury Corporation	Borough Engineer, Town Hall, Dewsbury	do.
Villa, Forteath Avenue, Elgin		Sutherland & Jamieson, Architects, Elgin	do.
Underground Lavatories, Market Place	Carlisle Corporation	H. C. Marks, Civil Engineer, 36, Fisher-street, Carlisle	do.
*Paving Works, Southend	Essex County Council	Chief Surveyor, County Offices, Chelmsford	do.
*Road and Sewer Works	Hornsey U.D.C.	E. J. Lovegrove, Southwood-lane, Highgate, N.	Nov. 4
Sewers, South Church	Bishop Auckland Rural Council	C. Johnston, Surveyor, Bishop Auckland	do.
Sewerage Works, &c.	Romford U.D.C.	J. Turvey, Surveyor, Market Place, Romford	do.
*Wrot-iron Fencing, Wandsworth Park	London County Council	Parks Department, 11, Regent-street, S.W.	do.
*Tarred Road Paving, &c.	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington, W.	do.
*Surface Water Drainage	Bromley U.D.C.	Surveyor to Council, Bromley, Kent	Nov. 5
*Making-up Harold-road	Tottenham U.D.C.	W. H. Prescott, Engineer, 712, High-road, Tottenham	do.
Cottages	Mallow R.D.C.	Maurice Regan, Board Room, Mallow	Nov. 6
Sewers, Irishtown, Ireland	New Ross U.D.C.	J. W. Gardner, Civil Engineer, Council Offices, New Ross	do.
Drainage Works, Busby, Lanarkshire	Middleton (Lancs) Corporation	W. L. Douglass, Civil Engineer, 3, Clydesdale-street, Hamilton	Nov. 9
Paving Works, &c., Highfield-street, and others	Mansfield Town Council	W. Welburn, Borough Surveyor, Town Hall, Middleton	do.
*Electricity Works	Aston Manor U.D.C.	Vallance & Westwick, Architects, Mansfield	Nov. 11
*Electric Power Station	Ilford U.D.C.	R. P. Wilson, Engineer, 66, Victoria-street, Westminster	do.
*Tramway Car Sheds, Workshops, &c.	Commissioners of H.M. Works, &c.	Surveyor to Council, 7, Cranbrook-road, Ilford	Nov. 12
*New Public Offices, Westminster	Dover Union	Secretary, H.M. Office of Works, Storey's Gate, S.W.	do.
*Infirmary and Nurses' Home	Deal & Walmer Joint Water Board	Cresswell & Newman, 54, Castle-street, Dover	do.
*Additional Buildings at Pumping Station	Rev. J. Ferguson	H. & C. Hawksley, 30, Great George-street, S.W.	Nov. 13
*Iron Mission Church	Hull Joint Dock Committee		Nov. 15
*New Dock	Winchester Corporation	Sir John Wolfe Barry, 21, Delahay-street, Westminster	Dec. 6
*New Museum Buildings		Colson, Farrow & Nisbett, 45, Jewry-street, Winchester	No date
*Residence and Stabling, Farnborough	Nottingham School Board	W. E. Trevena, Architect, Farnborough, Hants	do.
Additions to Schools, Stanley-road		J. N. Bromley, Architect, Queen-street, Nottingham	do.
Weaving Shed, Holbeck, Leeds		W. A. Hobson & Co., Architects, 82, Albion-street, Leeds	do.
Alterations to Cory's Corner, Bute-street, Cardiff	Messrs. N. Rees & Sons	Jones, Richards & Budgen, Architects, 95, St. Mary-st., Cardiff	do.
Restoration of Warehouse, Working-street, Cardiff	Hambledon (Surrey) R.D.C.	do.	do.
Cottage at Sewage Disposal Works, Cranleigh		E. L. Lunn, Surveyor, 36, High-street, Guildford	do.
Eight Houses, South Moor-lane, Stanley		T. E. Crossing, Architect, Front-street, Stanley	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Tenders to be delivered
*Town Hall Keeper	Finsbury Council	2*l.* per week, &c.	Oct. 30
*Clerk of Works	Stafford Union	Not stated	do.
*Sanitary Inspector	Lambeth Boro' Council	120*l.*	Oct. 31

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv.* *Contracts, pp. iv. vi. viii. x. & xxii.* *Public Appointments, pp. xix. & xxii.*

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PRICES CURRENT (*Continued*).

WOOD.

	£	At per standard. s. d.	£	s. d
Dantzig and Stettin Oak Logs—				
Large, per ft. cube	0	2 6	0	3 0
Small " "	0	2 3	0	2 6
Wainscot Oak Logs, per ft. cube	0	5 0	0	5 6
Dry Wainscot Oak, per ft. sup. as inch	0	0 8	0	0 7
in. do. do.	0	0 7	-	- -
Dry Mahogany—				
Honduras, Tabasco, per ft. sup. as inch	0	0 9	0	0 11
Selected, Figury, per ft. sup. as inch	0	1 6	0	2 0
Dry Walnut, American, per ft. sup. as inch	0	0 10	0	1 0
Teak, per load	16	0 0	20	0 0
American Whitewood Planks—				
Per ft. cube	0	3 0	0	3 6
Prepared Flooring—		Per square		
1 in. by 7 in. yellow, planed and shot	0	13 6	0	16 6
1 in. by 7 in. yellow, planed and matched	0	13 6	0	17 6
1¼ in. by 7 in. yellow, planed and matched	0	16 0	1	1 0
6 in. at 6d. per square less than 7 in.				
1 in. by 7 in. white, planed and shot	0	11 0	0	13 0
1 in. by 7 in. white, planed and matched	0	11 6	0	13 6
1¼ in. by 7 in. white, planed and matched	0	14 0	0	16 6
6 in. at 6d. per square less than 7 in.				

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £	s. d.	£	s. d.
Rolled Steel Joists, ordinary sections	6	15 0	7	15 0
Compound Girders " "	8	15 0	10	0 0
Angles, Tees and Channels, ordinary sections	8	12 6	10	12 6
Fitch Plates	8	15 0	9	10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7	5 0	9	0 0

METALS.

	Per ton, in London. £	s. d.	£	s. d.
Iron.—				
Common Bars	8	0 0	8	10 0
Staffordshire Crown Bars, good merchant quality	8	10 0	9	0 0
Staffordshire "Marked Bars"	10	10 0	-	- -
Mild Steel Bars	9	0 0	9	10 0
Hoop Iron, basis price	9	5 0	9	15 0
" " galvanised	16	0 0	-	- -
(* And upwards, according to size and gauge.)				
Sheet Iron, Black.—				
Ordinary sizes to 20 g.	10	0 0	-	- -
" " to 24 g.	11	0 0	-	- -
" " to 26 g.	12	10 0	-	- -
Sheet Iron, Galvanised, flat, ordinary quality.—				
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12	10 0	-	- -
" " 22 g. and 24 g.	13	0 0	-	- -
" " 26 g.	14	0 0	-	- -
Sheet Iron, galvanised, flat, best quality.—				
Ordinary sizes to 20 g.	16	10 0	-	- -
" " 22 g. and 24 g.	17	0 0	-	- -
" " 26 g.	18	10 0	-	- -
Galvanised Corrugated Sheets.—				
Ordinary sizes, 6 ft. to 8 ft. 20 g.	18	10 0	-	- -
" " 22 g. and 24 g.	13	0 0	-	- -
" " 26 g.	14	0 0	-	- -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	5 0	-	- -
" " 22 g. and 24 g.	13	5 0	-	- -
" " 26 g.	14	5 0	-	- -
Cut nails, 3 in. to 6 in.	9	10 0	10	0 0
(Under 3 in. usual trade extras.)				

LEAD, &c.

	Per ton, in London. £	s. d.	£	s. d
Lead—Sheet, English, 3 lbs. & up.	14	10 0	-	- -
Pipe in coils	15	0 0	-	- -
Soil Pipe	17	10 0	-	- -
Zinc—Sheet—				
Vieille Montagne ton	24	10 0	-	- -
Silesian	24	0 0	-	- -
Copper—				
Strong Sheet per lb.	0	1 0½	-	- -
Thin "	0	1 2	-	- -
Copper nails "	0	1 2	-	- -
Brass—				
Strong Sheet "	0	0 11	-	- -
Thin "	0	1 1	-	- -
Tin—English Ingots "	0	1 3½	-	- -
Solder—Plumbers' "	0	0 6½	-	- -
Tinmen's "	0	0 8	-	- -
Blowpipe "	0	0 9	-	- -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d. per ft. delivered.
" " fourths	2½d. " "
21 oz. thirds	3½d. " "
" " fourths	3½d. " "
26 oz. thirds	5d. " "
" " fourths	4½d. " "
32 oz. thirds	6d. " "
" " fourths	5½d. " "
Flatted sheet, 15 oz.	3½d. " "
" 21 "	4½d. " "
½ Hartley's Rolled Plate	2½d. " "
⅝ " " "	3½d. " "
¾ " " "	3½d. " "

PRICES CURRENT (*Continued*).

OILS, &c.

	£	s. d.
Raw Linseed Oil in pipes per gallon	0	2 9
" " " in barrels "	0	2 10
" " " in drums "	0	3 0
Boiled " " in pipes "	0	2 11
" " " in barrels "	0	3 0
" " " in drums "	0	3 2
Turpentine, in barrels "	0	2 3
" in drums "	0	2 5
Genuine Ground English White Lead per ton	22	0 0
Red Lead, Dry "	22	10 0
Best Linseed Oil Putty per cwt.	0	9 0
Stockholm Tar per barrel	1	10 0

VARNISHES, &c.

	per gallon. £	s. d
Fine Elastic Copal Varnish for outside work	0	16 0
Best Elastic Copal Varnish for outside work	1	0 0
Best Elastic Carriage Varnish for outside work	0	16 0
Best Hard Oak Varnish for inside work	0	10 0
Best Extra Hard Church Oak Varnish for inside work	0	10 0
Fine Hard Copal Varnish for inside work	0	16 0
Best Hard Copal Varnish for inside work	1	0 0
Best Hard Carriage Varnish for inside work	0	16 0
Extra Pale Paper Varnish	0	12 0
Best Japan Gold Size	0	10 6
Best Black Japan	0	16 0
Oak and Mahogany Stain	0	9 0
Brunswick Black	0	8 6
Berlin Black	0	16 0
Knotting	0	10 0
Best French and Brush Polish	0	10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERCARN.—For the erection of chapel, caretaker's house, &c., for the Urban District Council. Mr. George Stevens, Surveyor, Council Offices, Abercarn:—

Ledbeter Bros.	£2,659	J. Jenkins	£2,579
Davis Bros., Abercarn*	2,648		

ASPATRIA (Cumberland).—For the execution of water supply works for the District Joint Water Board. Messrs. Pickering & Crompton, C.E., 11, Lowther-street, Whitehaven. Quantities by the engineers:—

First Section of Works.

Contract No. 1.—Supply of Cast-iron Pipes.

D. Y. Stewart, St. Rollox, Glasgow* £6,127 0 9

Contract No. 2.—Construction of Reservoir and Laying and Jointing Pipes.

John Laing, Melbourne-street, Carlisle* £5,524 13 9

Contract No. 3.—Stand-post and Lattice Bridge, Valves, Hydrants, &c.

Blataborough & Sons, Brighouse, Yorkshire* £265 6 3

CARDIFF.—For widening three bridges, for the Corporation. Mr. W. Harpur, C.E., Borough Engineer, Town Hall, Cardiff. Quantities by the Engineer:—

Heenan & Froude	£5,707 3 9	Dawnay&Sons	£4,967 15 1
Handyside&Co.	5,545 10 0	Baker & Co...	4,698 11 4
Finch & Co...	5,323 12 11	Westwood & Co.,Millwall*	4,366 14 5

CATERHAM-ON-THE-HILL (Surrey).—For alterations and additions to the Clifton Arms public-house, for Messrs. Page & Overton, Ltd. Mr. A. Broad, architect, 22, George-street, Croydon. Quantities by the architect:—

G. Cheeseman	£811	W. Potter	£630
W. Harman	796	C. E. Scrivener	614
Vaughan	690	D. W. Barker, Croydon*	613
Akers & Co.	655		

CROYDON.—For additions to Lansdown, No. 28, Wellesley-road. Mr. A. Broad, architect, 22, George-street, Croydon. Quantities by the architect:—

E. J. Saunders	£429	Akers & Co.	£367
W. Potter	382	D. W. Barker*	360

GREAT BERKHAMSTED.—For the erection of five residences, North-road and Charles-street, for Mr. William Dwight. Mr. Charles H. Rew, architect, Berkhamsted:—

C. Brightman	£4,075	Honour & Son	£3,497
T. Tirrell	3,950	Jones & Sons, Berkhamsted*	3,305
H. & J. Matthews	3,895		
Nash, Young, & Horne	3,866		

[Architect's estimate, £3,300.]

GREAT YARMOUTH.—For the supply of hardwood road paving blocks for the Town Council. Mr. J. W. Cockrill, C.E., Borough Surveyor, Great Yarmouth:—

For Jarrah Wood.

	Price per 1,000. £	s. d.
Acme Wood Flooring Co., Ltd.	12	2 3
Burt, Boulton, & Haywood, Ltd.	11	3 9
W. Griffiths & Co., Ltd.	11	0 0
Chateau & Co.	10	10 0
M. Butcher	10	10 0
Jarrah Timber and Wood Paving Corporation, Ltd.	10	10 0
M. C. Davies Karri and Jarrah Co., Ltd	10	9 9
Millar's Karri and Jarrah Forests, Ltd.	10	8 5
Graham & Co.*	9	17 6
Millar's Karri and Jarrah Forests, Ltd., 3 in. by 7 in. by 4 in.	7	19 7
Millar's Karri and Jarrah Forests, Ltd., 3 in. by 6 in. by 4 in.	6	16 9

For Red Gum Wood.

Hemingway, Thomas, & Pierce	10	0	0
M. Butcher	9	10	6
E. Alcott	9	10	0
Acme Wood Flooring Co., Ltd.	9	0	0

GREAT YARMOUTH.—For the supply of granite setts for tramways, for the Town Council. Mr. J. W. Cockrill, C.E., Borough Surveyor, Great Yarmouth:—

	Price per ton. £	s. d.
Sanitary Pavement Co., London, S.W.‡	3	1 9
T. Moy	1	19 2
Do.	1	15 3
United Newry Granite Co.	1	15 0
London Basalt Stone Co., Ltd.	1	15 0
Macleod Edwards	1	14 8
Richfeldt & Co.	1	13 9
Rowley Regis Granite Co., Ltd.	1	13 6
Dickson & East	1	13 6
Griffiths & Co.	1	13 0
R. Tate	1	13 0
J. Ross	1	12 9
Brooks, Ltd.	1	12 3
H. Cooper	1	11 9
M. Butcher	1	11 6
Illingworth	1	11 6
Sommerfield & Mead	1	11 6
Burgess, Burgess, & Co.	1	11 0
Watson & Co.	1	10 0
Manuelle (Aberdeen stone)	1	10 0
M. Butcher (Norway stone)	1	9 6
Manuelle (Norway stone)	1	9 0
Skjelsbos Stonhaygen	1	9 0
Van Praagh & Co.	1	7 11
J. Brunton	1	7 9
A. Brunton, Hull*	1	5 6

‡ Accepted for 700 yards.

GREAT YARMOUTH.—For the supply of Portland cement in connexion with tramway works, for the Town Council. Mr. J. W. Cockrill, C.E., Borough Surveyor, Great Yarmouth:—

	Price per ton. £	s. d.
Earl & Son	2	18 4
Do.	2	11 0
Burstall & Co.	1	19 0
Forder & Son	1	19 0
Barton Cement Co.	1	17 0
Coles, Shadbolt, & Co.	1	17 4
J. Brunton	1	16 0
Sommerfield & Mead	1	16 0
Sussex Portland Cement Co.	1	16 0
Bishop, Pratt, & Co.	1	15 0
Saxon Cement Co.	1	14 8
East Anglian Cement Co.	1	13 6
McEuen & Co.	1	13 3
Henthorne & Co.	1	13 0
Kaltenbach & Schmitz	1	13 0
Garson Blake	1	12 10
Macleod, Edwards, & Co.	1	12 9
Pattrick	1	12 6
De Wolf	1	12 6
Smeed, Dean, & Co.	1	12 6
Brunton & Son	1	12 3
Tolhurst & Son	1	12 0
Shackleton & Son	1	11 6
Trechmann Weekes	1	11 6
Associated Portland Cement Co.*	1	11 6
Louis Volkverts	1	11 0
E. J. & W. Goldsmith	1	10 9
Formbys Cement Co.	1	10 5
Dawber	1	10 0
Furness	1	10 0
Peters Bros.	1	10 0
Worcester Cement Co.	1	10 0
Duckett & Son	1	9 6
Jacobs Bros.	1	6 0

GREAT YARMOUTH.—For the erection of cemetery chapel, superintendent's house, &c., Caister, for the Town Council. Mr. J. W. Cockrill, C.E., Borough Surveyor, Great Yarmouth. Quantities by the Borough Surveyor:—

Eastoe	£1,987 0	Bray	£1,783 0
Potter	1,925 0	Grimble	1,760 0
Gunns	1,907 10	Harman	1,754 0
Cafley	1,898 0	Balls	1,742 0
Carter & Wright	1,866 0	Wright	1,740 0
Banyard	1,825 0	Beech, Hemsby, Norfolk*	1,704 0
Smith	1,816 10		

[See also next page.

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HASTINGS.—For laying sewers, &c., Hollington-lane, for the Corporation. Mr. P. H. Palmer, Borough Engineer, Town Hall, Hastings :—

C. Marchant, Hastings*.....£308 18 7

LEICESTER.—For the erection of a warehouse, Charles-street, for Messrs. Davies & Co., Limited. Mr. Chas. Kempson, architect, Corporation-buildings, Leicester. Quantities by the architect :—

Herbert & Sons	£3,623 0 0	F. Elliott	£3,314 0 0
T. R. Tebbatt	3,483 0 0	W. Haddon ..	3,314 0 0
Bentley & Co.	3,400 0 0	Mason & Son	3,245 7 0
H. Bland	3,377 0 0	Bradshaw Bros.	3,245 0 0
F. Rudkin....	3,366 14 6	J. H. Clayton	3,241 0 0
Clarke & Garratt	3,330 0 0	Beck & Co.*..	3,221 0 0

[All of Leicester].

LONDON.—For alterations and additions to Charing Cross Hospital. Mr. A. Saxon Snell, architect. Quantities by Messrs. Northcroft, Son, & Neighbour :—

Howard & Co.	£92,772	Trollope & Sons ..	£86,470
Patman & Fotheringham	89,300	Higgs & Hill	85,844
Bywaters & Sons ..	87,500	B. E. Nightingale..	85,767
H. Lovatt	87,000	Holloway Bros., Lambeth*	82,730
Spencer, Santo, & Co.	86,775		

LONDON.—For additions to the North-East London Institute, Dalston-lane, N.E. Mr. A. W. Cooksey, architect, 4, Adam-street, Adelphi, W.C. :—

Foster Bros.	£12,378	Davis & Leamy....	£10,985
Pollard & Brand ..	12,270	W. Shurmur	10,980
H. H. Hollingsworth	11,933	Sabey & Son	10,895
B. E. Nightingale .	11,695	Kilby & Gayford ..	10,840
Perry Bros.....	11,657	G. Parker	10,830
Josolyne & Young .	11,350	Chessum & Sons, Bow*	10,826
H. L. Holloway ..	11,072	J. Appleby	10,790
Roome & Co.....	11,067		
W. Wallis	10,997		

LONDON.—For fitting up new premises, 41, 42, and 43, Grand Parade, Harringay, for Messrs. W. Thomas & Co. :—

Cadman & Son	£1,070	Jewuck & Crocker....	£744
Marchant & Hirst*	998		

NEWQUAY (Cornwall).—For the erection of new infant school buildings, alterations and additions to existing girls' school, &c., for the St. Columb Minor School Board. Messrs. Cowell & Cowell, architects, Central Chambers, Newquay :—

C. Carrwick.....	£3,975	W. S. Tippett	£2,630
Cocking & Jenkin ..	2,863	Trehane & Son†	2,600
Hobbs & Son	2,800		

PORTSMOUTH.—For additions to schools, Church-street, Landport, for the School Board. Mr. A. H. Bone, architect, Cambridge Junction, Portsmouth :—

Clark & Son	£3,700 0	H. Jones.....	£3,176 0
M. Coltherup....	3,515 0	J. W. Perkins ..	3,149 0
W.W. Learmouth	3,509 12	C. M. Dash	3,089 0
H. H. Hall.....	3,449 0	J. Crockerell, Southsea*	2,977 0
S. Salter	3,288 0		
W. T. Dugan....	3,201 19		

SILLOTH (Cumberland). — For additions to cocoa house, for Silloth Cocoa House Company. Mr. G. Armstrong, architect, 24, Bank-street, Carlisle :—

Building.—W. Leighton, Carlisle*....	£188	4	0
Joinery.—J. R. Thomson, Silloth*....	175	5	0
Slating.—F. Hart, Carlisle*	19	5	0
Plastering.—Johnston Bros., Silloth*	58	17	6
Painting.—T. Mackay, Silloth*.. ..	24	10	0

SOUTH SHIELDS.—For the erection of a dwelling-house for Mr. R. Brown at Westoe. Mr. H. Grieves, architect, Albany-chambers, South Shields :—

W. J. Robertson	£850	0	0
R. Allison	845	0	0
J. Young, Tyne Dock *.....	843	16	9

STONEHAVEN (N.B.).—For the execution of water supply works, Drumiithie, for the District Committee of the County Council of Kincardineshire. Mr. Jno. Graham, engineer, Stonehaven. Quantities by the engineer :—

W. Roe.....	£496	0	2
J. Murray	434	7	5
J. Ross	415	0	0
W. Robertson ..	388	16	4
Colin Wood & Co.	364	5	1
J. Warden	£358	10	0
A. Mathieson, Stonehaven*	357	15	4
R. Mitchell	357	5	8

WIMBLEDON.—For the erection of office building, Station Approach, for Messrs. Rickett Smith & Co., Ltd. Mr. A. Broad, George-street, Croydon, architect. Quantities by the architect :—

Somerford & Son . ..	£589	Lorden & Son.....	£544
Garrett & Son.....	575	Akers & Co.....	496
E. J. Burnand.....	570	W. Potter, Croydon*	490
D. W. Barker.....	559		

WOODFORD (Essex).—For the execution of sewerage works, Snakes-lane, for the Urban District Council. Mr. Wm. Farrington, Surveyor, Council Offices, Woodford Green :—

W. & C. French, Buckhurst Hill* £141 2 4

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The Builder.

VOL. LXXXI.—No. 3765. NOVEMBER 2, 1901.

ILLUSTRATIONS.

Selected Design for the Queen Victoria Memorial.—Mr. Aston Webb, A.R.A., Architect :—
View from West End of the Mall, facing Buckingham Palace ..... *Extra Large Photo-Litho.*
View from Buckingham Palace, looking down the Mall ..... *Extra Large Photo-Litho.*
Illustrations of Old Chelsea and Millbank ..... *Double-Page Ink-Photo.*

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The Queen Victoria Memorial Designs.

THE designs for the Queen Victoria Memorial have been exhibited this week in a room in St. James's Palace. Of the selected design, by Mr. Aston Webb, we have already expressed an opinion (see the *Builder* for August 3), and in the present issue we are enabled to give the plan and two perspective views; one looking along the Mall eastwards from Buckingham Palace, the other looking towards Buckingham Palace from the west end of the Mall.

On now having the opportunity, for the first time, of comparing the selected design with the others, we are decisively of the opinion that Mr. Webb has fairly won his position on the ground of the superiority of his plan. In a matter of this kind it is the plan, the mode of laying out the ground, that gives the key of the position. This is especially to be remarked in the manner in which the east end of the Mall is connected with Whitehall. It is at this point that all the other competitors have comparatively failed. They have nearly all got a weak junction of the Mall with Whitehall. The difficulty at this point arises from the fact that the Mall has to be brought into Whitehall at an oblique angle. Mr. Webb has hit upon the only means of getting over this inherent defect of the site, by inserting a circle at the junction—a feature which masks the irregularity of line of Pall Mall and Whitehall. Moreover, he has found out, what no other competitor seems to have discovered, that the central axis of the east Strand, produced, can be made to meet the central axis of the Mall at the centre point of his circular court. Thus the entrance to the Mall is made to centralise with the line of the Strand, instead of opening obliquely upon the line of Whitehall.

In the treatment of the semi-circular forecourt in front of Buckingham Palace one or two important alterations have been made in Mr. Webb's design since it was exhibited at the Foreign Office three or four months ago. The screen between Buckingham Palace court-yard and the semicircular court-yard is treated in a more monumental manner, being transformed into an entirely masonic colonnade, in place of the iron grille and gates shown in the centre portion in the original design. This treatment gives a more homogeneous character to the screen in front of the palace, and also makes it more of a real and effective screen between the immediate courtyard of the Palace and the semicircular ornamental garden or parterre into which the public would have access. In the outer semicircular screen the pavilions on each side of the central entrance have been suppressed, and their place is taken by a lower screen wall with obelisks flanking the entrance; the object of the alteration being to clear the view of the actual monument as seen from the Mall, and leave it more open to the road. The flights of steps which, in the view we publish, are seen on the outer side of the quadrant, descending to the level of the walk by the St. James's Park lake, though retained in this drawing, are to be abandoned, as the architect considered (and we quite concur with him) that they broke the curve of the retaining wall in an undesirable manner, and were unnecessary in a practical sense, as the broad flight of steps opposite the end of Buckingham Palace-road give all the access necessary to the Park walks. As now intended, the curved retaining walls will rise directly out of the Park lake, and be reflected in its waters. Another point which is gained is that it is proposed to remove the lodge now standing at the south-west angle of the Park, and which is not central with anything, and to place there a small monument of some kind, with a parterre of shrubbery in front of it, past which there will be a direct vista along the Park water to the Horse Guards. The whole of this design, in fact, is calculated to secure centralised lines of vista; and that is one of its great merits—it is all laid out on a symmetrical system. The semicircular enclosure in front of the Palace-yard screen is laid out, as will be seen in the view, with a pavilion and a fountain half way along the quadrant, and a decorative arrangement of parterres internally, following out the design of the semicircular screen, and connected with it. A small portion of the Green Park is cut away by the screen, but as much as is taken away from the public in this way with one hand, is given back to them with the other, as they will be freely admitted to this decorative *place* within the semicircular screen.

In regard to the central monument by Mr. Brock, as to which we remarked in a former article that the architectural competitors seem to have been left to work up to a sculptural monument without having any notion of its design, it appears that there was a conference between the sculptor and the architects, in which the former described in a general way his intended design, and the proposed disposition of the sculpture, and gave the architects a base of 50 to 60 ft. to work to. But it was subsequently found that this base was quite insufficient, and the actual width of the base of the monument is over 100 ft. Mr. Webb has from the first assumed that a central exit from the Palace yard, against the back of the monument, would be out of the question, and has accordingly carried the screen of the Palace yard across the back of the monument, in a curve following the lines of its plan, and made two entrances, or rather an entrance and an exit, one on each side of it.

The general details of the design are of a quiet and unpretentious Classic type. The dignified effect of the whole arises from the *ensemble*, and from the admirable and consistent manner in which the whole is planned. One could not find a better example of the principle that plan is the basis of design.

No other competitor has achieved such an architectural connexion of the Mall with Whitehall as we see in Mr. Webb's plan. Both Mr. Jackson and Mr. Ernest George leave what we call a *delta* between Whitehall and the real commencement of their processional road. Mr. Jackson commences his processional road just west of the York column steps; which, failing a direct connexion with Whitehall, was perhaps the best and most obvious point to commence. He erects there a large and fine arch, of severely treated Classic style, crowned with a bronze group of fine outline, and with a bronze bas-relief inserted near the foot of the large plain masonry piers on each side. The design for the wrought-iron gates looks as if it would work out into something fine and sumptuous on full size scale. The central archway gives access to a central avenue 40 ft. wide, bordered by tolerably wide strips of lawn which are backed by trees, while along each side of the margin of the road are a series of statues at regular intervals, each on a pedestal at the back of a small semi-circular *exedra* cutting into the

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grass lawn. All this would have a very good effect. We observe that the *Times* objects that one could never find enough good statues to fill up the scheme; but that is quite a mistake; it would be only a question of commissions and money. There is enough talent among the younger generation of English sculptors to supply any amount of good statues, if the Government would only give them the opportunity. In regard to the road, we may observe that every competitor has perceived that, as a matter of course, the axis of the road along the Mall must align with the centre of Buckingham Palace; which means that the existing trees must either be destroyed or moved, as we pointed out from the first.

Mr. Jackson's decorative forecourt at the end of the road, and in front of the Palace railing, is laid out in a most effective manner. It is a parallelogram flanked by a colonnade, which is returned at the east side to make an angle emphasised by a picturesquely designed pavilion on each side, with curved pediments and crowned by an obelisk finial, and seated bronze statues at the four angles. The bronze statues would perhaps, in this position, detach themselves a little too strongly from the stonework, and one is doubtful whether the effect would not be better, because more homogeneous, if the statues were of the same material as the rest of the pavilion. The side portions of the space within this screen, the width of which is defined by the return screen, are laid out in a most artistic manner as an ornamental parterre, the centre being accentuated by a large bronze fountain on the margin of each parterre, while two subcentres, as we may call them, in each parterre are marked each by a group of white marble statuary on a large pedestal of the same material; the four groups symbolising respectively South Africa, Canada, India, and Australasia. A brilliantly executed water-colour drawing, somewhat too profusely peopled with nurse-maids, shows well the sparkling effect of the white statuary groups with the stone screen as a background. This design contains many fine suggestions, and the monumental arch forming the entrance to the road is perhaps the best example in the competition of this type of erection, owing to its mass and simplicity of outline.

Mr. Ernest George's design also shows many fine points in the architectural detail. Like Mr. Jackson, he leaves a *delta* between his monumental road and Whitehall. Considering that one point in regard to the scheme was the opening out of the Mall into Whitehall, it seems odd that three out five of the competitors have left this junction of the two roadways practically to take care of itself. Having found our way from Whitehall through the *delta*, we come upon a graceful monumental arch with centre and side openings, much lower in proportion than one is accustomed to see a monumental arch, and therefore not so imposing as some of the others; but a very pleasing and harmonious composition. The road is treated very simply, with a row of trees on each side, which is "stopped" to the west of the Duke of York steps, and on either side of the opening to Marlborough Gate, by a pedestal placed longitudinally in line with the line of trees. Mr. George's ornamental court in front of Buckingham Palace is of longer proportion than the others, and carried further eastward into the Mall; it is a parallelogram terminating eastward in a semi-circle. The monument is placed in the centre axis of this court, in a smaller parterre of its own, running lengthways and parallel with the outer screen of the court, and terminated at each end by a fountain with a circular basin. As the entrance to the court is central in the middle of the semi-circular screen, the traffic enters facing the monument and fountains, and then divides on each side of them, the north side leading to an opening into Constitution Hill, the south side to one into Buckingham Gate. Thus the traffic is taken *inside* the monumental court, and diverges close past the enclosure railing of the Palace itself, instead of being kept, as in the selected plan, entirely outside the monumental court and therefore further away from the Palace. This seems a decided mistake as to traffic planning, but there is plenty to admire in the architectural details of the design. The fountains at the back and front of the monument would have a fine effect. The semi-circular screen which bounds the court eastward is a double colonnade with domed pavilions at intervals. At the north and south sides of the court the screens are treated in a simple but exceedingly graceful manner. On the south side we have at intervals a group of four columns close together on the corners of a square, carrying entablatures and statues, and based on a projecting rusticated pier in the masonry below; on the north side we have similar groups of four columns, with a light iron railing between them, about two-thirds the height of the shaft. The effect of this, as shown in the geometrical elevation, is very refined; and the effect of the screen in the general view, with the masses of foliage outside it, is very good. In the interior of the court, it should be added, the parallelism of line east and west and is kept up and emphasised by a formal row of trees on each side of the monument site and parallel with it and with the outer screens.

Sir Thomas Drew, like the two last-named competitors, avoids attempting any special treatment of the junction of the Mall with Whitehall; he says that sufficient cannot be obtained by any triumphal arch brought forward "to the frontage of buildings in Charing Cross incongruous with it," but he is not content to leave a *delta*, and in this respect his design is more carefully considered than most of the others. He provides, as soon as we are clear of the street buildings, a forecourt of architectural dignity, 110 ft. wide and flanked by buildings of stately character, which is to form a kind of vestibule to the monumental arch and road, a transition between the common street and the State road. This is a fine idea, but the monumental gateway itself we cannot like; it seems to us quite out of proportion—too high for its width, and not fortunate in its sky line. The Mall is made to take one straight line from a point north of Drummond's Bank (so as to avoid the cost of buying that out), and as the trees of the Mall must be displaced in any case, not being central with the axis of the Palace, the line can just as well be turned a little as not. Sir Thomas Drew is the only one of the competitors who tries to insist on remodelling the front of the Palace. Others probably saw the desirability of this as fully as we did, but did not perhaps feel justified in offering what they were not asked for. Sir Thomas Drew says in his report on the design:—

"The front of Buckingham Palace, built in 1842, cannot be said to be a work of fine architecture or a background of dignity for the great memorial. A memorial composition standing, say, 60 ft. high would not eclipse the Palace front, but would somewhat subordinate the central entrance as its leading feature. My proposition is to recast the façade architecturally without changing its fenestration or altering the internal arrangement. I would raise a pavilion block at each end, advanced from the building, which would give cast shadow to break the monotony of the elevation. The front I would remodel—accepting the present floor levels and window spacing—by applying a Corinthian order elevated on a rusticated or coursed basement, as an improvement of the present lowest story. I submit a detailed elevation for an architectural front."

With this we entirely agree; and we may add that the treatment of the Palace façade, considering that the author has felt bound to retain the windows as existing, is very successful and quite worth consideration, while it is not such as to entail any exorbitant outlay.

Dr. Rowand Anderson's design is, at the Buckingham Palace end, much slighter and more unpretending than any of the others; he seems to have assumed that the monument should dominate everything at this part, and that there should be no important architectural features to compete with it. Consequently we have only a balustraded semicircle as a plateau for the monument, with a smaller plateau at the re-entering angle at each side, containing ornamental fountains. In his Report on the design,* he seems to assume that he was to make a design for the monument itself, which we take it is Mr. Brock's commission; the architects were only to furnish the frame for it, though it will no doubt be better if the architect who carries out the work assists the sculptor in the architectural details of the monument. Dr. Anderson's proposed treatment of the roadway, and of the decorative sculpture connected with it, is of considerable interest; we have not space to go into it fully, but the arrangement of the sculpture is intended to illustrate historically the title of the present sovereign to the throne. The statues of English sovereigns are arranged in historical order, and opposite Marlborough Gate is a special feature in the shape of a balustraded semicircle, laid out as a parterre, with an equestrian statue of Queen Elizabeth at the crown of the semicircle, and statues of great men of the Elizabethan period on subordinate pedestals in and at the extremities of the balustrade. This is a fine idea. At the commencement of the monumental road, where, like other competitors, the author makes no attempt at a definite architectural connexion with Charing Cross, there is an elaborate and graceful two-storied triumphal arch of Renaissance type, the upper arch containing an equestrian statue—in whose honour is not suggested. This arch is a very pleasing design in itself, but it is set in the middle of a space so that people can walk round on each side of it; a treatment which always looks rather unmeaning in the case of an arch which is intended as a gateway.

* Sir T. Drew and Dr. Anderson each kindly sent us a copy of his Report. The other competitors' Reports on their designs we have not seen.

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THE WORK OF THE LOCAL GOVERNMENT BOARD IN 1900.

THE work of the Local Government Board is singularly characteristic of the English Constitution, for it has to do with the most diverse matters, and in most cases it is merely an addition to each Local Authority. It advises, condemns, and adjudicates, but the actual working machine is in some form or another the Local Authority, the County, the District, or the Parish Council, or the Guardians of the Poor. And it says much, on the whole, for the tact of English administrators that this "meddling" function, so to say, is discharged in such a manner that there is scarcely any friction between the Local Government Board and the many Local Authorities scattered from one end of England to the other. But with so varied and large a mass of work it is impossible for us to do more than note some portions of it.

At the present time one of the subjects uppermost in the public mind is that of taxation; it may be desirable, therefore, to touch on the subject in regard to local loans. For every loan to a Local Authority means sooner or later, additional taxation to the inhabitants of the locality. It will, we think, somewhat startle the ratepayer when he is told that during the year ending December, 1900, the Local Government Board has sanctioned loans to Town Councils and to Urban District Councils under the Public Health Acts which in the aggregate amount to nearly six and a half millions (6,304,217*l.*). But this expenditure represents, large as it is, an equally large advance in the public well-being, and shows that, in spite of the sanitary shortcomings which are still to be found, the country is making distinct progress towards a more satisfactory situation. The objects of the expenditure are not classified in the Report* before us, but in all cases they tend to the material and intellectual benefit of the ratepayers, and the latter undoubtedly in exchange for the expenditure obtain substantial results. Street improvement appears to be the most important head, but sewerage is much in evidence, water supply, lighting, hospitals, fire-stations, public libraries and reading-rooms, public walks or pleasure grounds, are all subjects which are to be found in this table. And it is specially satisfactory that the expenditure should not be confined to purely utilitarian purposes, and that considerable sums should be spent on such work as public walks and pleasure grounds. Lancaster, for example, required 4,500*l.* for this purpose, Glamorgan 5,093*l.*, South Shields 2,000*l.*, and Stockport 6,881*l.* None of these places are tourist resorts; they are busy commercial towns; and the expenditure is not for the benefit of holiday-makers, as at Scarborough and Southend, but for those who are living lives of toil.

When we come to the question of artisans' dwellings, we do not find so large an expenditure by borrowing as might have been expected—the total is 608,512*l.* Burton-on-Trent was one of the largest borrowers, since this town required 33,000*l.*, a point which is of some interest, since there is an idea that the housing problem is a serious one only in a few large towns. It is interesting to refer to the results of the Small Dwellings Acquisition Act, 1899, which was a pet scheme of Mr. Chamberlain, and which some Government supporters are in the habit of referring to as one of the great social reforms of the present Administration. At present the legislative mountain has produced an infinitesimal mouse, for only 1,830*l.* has been raised by loans for the purpose of this Act, an amount which, unless largely increased in subsequent years, shows that the Act is of no value at all.

In the foregoing remarks we have been concerned only with towns and urban districts. What has been done in the country villages? The amount of loans by Rural District Councils which has been sanctioned was 623,067*l.* To a certain extent it would appear that the term "Rural District Council" is not an accurate description of this Authority, since some of the districts—as, for instance, Merton, and Mitcham, and Pinner—have a good deal of the suburban character about them. The purely rural districts do not seem to have needed money. Most of the loans have been required for purposes of sewerage and sewage disposal, but occasionally highway and street improvements have been the objects on which money has been spent. Improvements in rural districts are less costly than in urban districts, and therefore we may probably be satisfied with the progress which is shown by the character of these statistics. If we add the amounts sanctioned both in the case of town and country we arrive at a total of over seven millions, nearly all of which represents money which has to be spent either in materials or labour, and a great deal of which goes into the pockets of artisans. Before leaving this subject we may conclude with the following figures: In the year 1874-75 the National Debt of the United Kingdom was, in round figures, 768,000,000*l.*, and the amount of total outstanding loans of Local Authorities was 92,000,000*l.*, which gives a percentage proportion of Local and National Debt of 12·07. In 1898-99 the National Debt had fallen to 627,000,000*l.*, while the Local Debt had increased to 276,000,000*l.*, and their proportion to 44·02—figures which we think justify the Local Government Board in not making borrowing by Local Authorities too easy.

One of the most important functions of the Local Government Board is its supervision of the poor law administration of the guardians. With this we are scarcely concerned, though one point should be noted, and that is the extension of cottage homes for pauper children. The planning of these homes to keep them as nearly as possible like private dwelling-houses would seem to give occasion for careful architectural thought, for it is essential that, whilst containing a reasonable number of children, they should at the same time be domestic in their character. One of these cottage "settlements" is thus described which belongs to the Rochdale Union. It consists "of a superintendent's house, a receiving home, eight homes holding twelve children each, and arranged in pairs, together with a home used temporarily as an infirmary." In the Blackburn Union these homes have been so planned that if for any reason it was desired to change their use, each home can, by very slight alterations, be converted into two ordinary cottages. A larger extension of this system is extremely desirable.

As we said at the commencement of this review of the work of the Local Government Board, they have, so to say, to "condemn" Local Authorities for neglect of duty. On the whole, though individual inspectors have strongly criticised the inaction of various Authorities, it does not appear that the Board itself has done very much. A complaint, it seems, was made against the Urban District Council of Farnborough that it did not provide sufficient sewers, and after a local inquiry the Board found that the complaint was duly substantiated, and accordingly called on the Council "to take the question of the execution of a proper scheme of sewerage into immediate consideration," and they have since submitted a scheme. The same result has arisen from a complaint against the Rural District Council of Halesowen and also against the Town Council of Truro. We suspect, however, that if inhabitants and ratepayers would more generally make complaint of local shortcomings, whether in regard to sanitation or housing, more Local Authorities would be found to be in default. But, unfortunately, few persons are willing to take such individual responsibility, especially if it is to result in higher rates, for there are many who would rather run the risk of illness than take the certainty of an increased rate.

We note that the Board print in this report various circulars and also abstracts of recent statutes; one of these is the ancient Monuments Protection Act, 1900, which empowers County Councils to become the guardian of any historical monument situated in their county or in an adjacent county, or to contribute towards the cost of maintaining or managing such monument, which is defined as being "any structure, erection or monument of historic or architectural interest." We could have wished that a circular had been issued to every County Council drawing their attention to this statute. It was but a week or two ago that we published an appeal for funds to preserve a monument of undoubted architectural interest in the West of England. It is very desirable that this statute should be fully made known, and we can see no reason why, as the Local Government Board call attention to it in their report, they should not also do so by circular letter. Their powers and responsibilities are very extensive, and it may be that they draw the line at exercising any of the functions of a ministry of fine arts. We may in that case ask, Why was it thought desirable to refer to the Report to this statute at all?

* Thirtieth Annual Report of the Local Government Board, 1900-1901.

NOTES.

Liverpool Cathedral.

To the surprise of every one, and certainly much to their own credit, the Liverpool Cathedral Committee, as will be seen from their advertisement in our present issue, have accepted the criticism of the architects as to their false position, and have withdrawn any requirement as to the copying of a particular historical style of architecture in the designs for the proposed cathedral. We say it is to their credit, for it is not every day that we meet with a committee in connexion with an architectural scheme who will have the candour and good sense to own that they have been proved

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to be in the wrong, and to act accordingly; and we might name more than one public body in London, entrusted with important public works, which has been as unmistakably shown to be in the wrong, but has adhered to its mistake out of sheer obstinacy and a refusal to give way. We think also that the architectural profession owe their thanks to the *Times* for its able and cordial support in the controversy. We observe also that the Committee have undertaken unreservedly to employ professional advice in making their selection for the final competition. We think it would have been much better if, instead of asking for portfolios of specimen drawings, they had organised a regular sketch competition for this cathedral in the first instance; the sketch designs to be publicly exhibited, and from them a limited number to be selected for the final competition. We should then have some idea what each of the selected competitors meant to do with the actual site, which under the present arrangement may remain a mystery until the final designs are actually sent in. However, we must hope that under the present better auspices there may be a good result in the end. At all events, there can be no doubt that the controversy which has arisen on the subject has done a great deal of good; it has compelled many persons, probably, to think about the real meaning of architecture in a way they never thought before, and has excited a great deal of public interest in the cathedral scheme; so that on the whole we may think that the initial mistake was a fortunate one, which led to so useful a discussion of the subject.

The Duke of Devonshire on Education.

THE Duke of Devonshire's speech at Liverpool on Saturday last explains very clearly why so little progress has been made by the Government in organising secondary and technical education; it is because the head of the Education Department—the Duke of Devonshire—has not the necessary courage and constructive ability. He complains that the schemes and the suggestions of technical experts are not clear. Of course, educational experts differ as to details, but it is for the statesman to choose among these methods. The Duke also complains of apathy on the part of the people. If he refers to the more ignorant of the electorate he is right; but there is abundant desire among all thinking people to see education improved. It never can be a subject on which the ordinary elector will grow warm, and it is the business of a statesman to follow the lead clearly given to him by the more thoughtful portion of the community and to endeavour to carry measures through Parliament. Of course, if the chief of the Education Department is afraid to act, the educational obstructives will soon put an end to any measure which the Government may propose. That County Councils, District Councils, and other Local Authorities are jealous of each other and have conflicting claims difficult to reconcile is, we think, untrue. But no Local Authority with a sense of business desires to have the law in such a state that it raises disputes among different authorities. To carry out a thorough system of technical and secondary education requires, we fear, men at the head of the Education Department stronger, more enthusiastic, and more clear-sighted than its present chiefs.

The London Building Act.

NEITHER decisions of County Court Judges nor magistrates are binding as legal precedents, but they are useful indications of the manner of interpreting statutes. The recent judgment, therefore, of the magistrate at Marylebone should be noted, since he held that where a building which could be inhabited in separate rooms came within section 74 of the London Building Act, if in other respect as regards size, it was covered by the words of the section. To say that the words "separate set of chambers, offices, or rooms" did not include separate and single rooms, would obviously have been contrary to the whole object of the section, which clearly is to protect the inmates of these large modern buildings, whether the inhabitants dwelt in flats or in single houses.

Domestic Filters.

IN the *Times* of Saturday last Dr. Priestley, the Medical Officer of Health for the Borough of Lambeth, draws attention to the "need that exists for domestic filters and a strict standard in connexion therewith." He points out that sand-filtration on a large scale does not always yield a pure water, and that, even if it does, the water may be subsequently contaminated in the mains and in storage tanks; hence the necessity for domestic filters. The well-known tests carried out at the conjoint laboratory of the Royal College of Physicians (London) and Surgeons (England) are briefly noticed, and interesting particulars are given of the surprising reduction of typhoid fever in the French army which followed the use of Pasteur (Chamberland) filters. Dr. Priestley considers these filters to be much superior to those made of infusiorial earth, and to be, indeed, the only filters which are really satisfactory. There is little that is new in Dr. Priestley's letter, but its insertion in the columns of the *Times* may do something to dispel the ignorance which prevails as to this important subject. Filters are still sold in great numbers which are worse than useless for purifying water, and the public cannot be too often reminded of the dangers of such appliances. At the same time, where a Public Authority supplies water for domestic purposes, the consumers may reasonably claim that the water shall be sufficiently pure without recourse having to be had to private filtration.

Ecclesiastical Dilapidations.

THE season of diocesan conferences has now nearly concluded. It has been noticeable for the fact that in almost every one of these gatherings ecclesiastical dilapidation has formed a prominent subject of discussion. Unfortunately, however, no clear solution of the present difficulties has been universally agreed on. We have already pointed out that the businesslike way of dealing with dilapidations is to exact that there shall be periodical surveys of clerical buildings, so that they may never be allowed to fall into the bad condition which is now so common. At the present time when a clergyman is offered a living one of his first considerations is the state of the parsonage and the adjoining premises. Over and over again a living is declined because of the amount which must be spent in putting the parsonage into repair. In many cases the retiring vicar or rector or his representatives are quite unable to meet the demand on them. This state of things can only be prevented by not allowing dilapidations to grow up, and this result will never be attained unless repairs even of a small kind are done at necessary, and it may be, frequent intervals. But business capacity is not characteristic of the clergy, and there is something pitiable and a little contemptible in observing the incapacity of the clergy to place the question of dilapidations on a reasonable footing.

Proposed Memorial to Mr. James Brooks.

THE Vicar of St. Faith's, Stoke Newington, writes that there is a feeling—with which we entirely sympathise—that some steps should be taken to erect a suitable memorial to the late Mr. James Brooks, especially in consideration of the work which he did in church architecture. With this idea, such a monument would fittingly be raised in some one of the churches for which he was architect, and the fact that Mr Brooks was for twelve years churchwarden of St. Faith's renders it suitable that this church should be the one to contain his monument. It is true that Mr. Brooks was not the original architect of the church, which was designed by Burges (not "Burgess," as the Vicar's circular spells it); but he added largely to it, besides being connected with it in the manner already mentioned. Any one who wishes to subscribe to such a monument is invited to communicate with the Rev. C. H. V. Pixell, St. Faith's Vicarage, Stoke Newington. As to the form of the memorial various suggestions have been made—a chancel screen, a stained glass window, a screen between the church and chapel &c.; and the Vicar would be glad to have suggestions from any of Mr. Brooks's friends. We should say that the memorial ought certainly to be in architectural form—a screen or other such object rather than a window. With this suggestion we are glad to express our entire concurrence in the proposal. Monuments are erected to many who have far less claim to them than Mr. Brooks had.

The Safety of Theatres.

THE "Old Playgoers" Clubmet at the Criterion, London, on Wednesday evening last to debate upon "The L.C.C. and the Safety of Theatres." The discussion was opened by Mr. E. O. Sachs, who expressed the opinion that good planning in the arrangement of theatres is of more importance than the use of fireproof materials or the adoption of a system of surprise inspections. He considers that the new regulations issued by the L.C.C. may be taken as a model of what such regulations ought to be, but advocates an extension of the powers of the Council. He remarked that the vacillation in the policy and requirements of the Council has made that body unpopular with the managers of old theatres, and thinks that the managers would have less cause for complaint if the London County Council and its Committees would leave matters more in the hands of its permanent officials, and especially to the superintending architect, instead of allowing every succeeding election and every change in the composition of its Committees to exert an influence upon the policy of the Council. Mr. Sachs further suggests that the Local Authorities should be relieved of their responsibilities with regard to theatre construction, and that one central authority, such as the Home Office or some other Government

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Department, should be charged with the superintendence of theatre construction throughout the whole of the United Kingdom. Several speakers pointed out that many provincial and foreign theatres possess better accommodation and more efficient arrangements for preventing the spread of fire than can be found in any London theatre. Most of the members of the club who took part in the discussion regarded the London County Council as the most suitable authority to have control over the construction of London theatres; but of eight theatre managers from whom replies to questions had been received, seven considered that the authority should be vested in the Lord Chamberlain, who already acts as censor of plays, rather than in the London County Council.

Architectural Association Conversazione.

THE annual conversazione of the Architectural Association was held on Friday evening last week at the rooms of the Institute of Painters in Water-colours—an excellent place for the purpose, as not only is there a large and fine suite of rooms, but the pictures on the walls—in this case the collection of the "International" Society—afford in themselves a very valuable addition to the entertainment. The visitors were received by the President and Mrs. Seth-Smith. The band of the Imperial Orchestra, in the East Gallery, played during the evening a selection of instrumental music, varied by the interpolation of songs by Miss Lilian Corner and Mr. Avalon Collard. In addition to the pictures on the walls, there were on view on screens the drawings by Mr. F. T. Green which obtained the Banister Fletcher Bursary; some water-colour sketches taken during the Association excursion to Cirencester by Mr. A. W. Hennings; architectural photographs by Mr. Wonnacott; some excellent work executed in the School of Design; and the design for a boys' school, by Mr. Drysdale, which obtained the Association Silver Medal. The large and commodious tea-room attached to the gallery enabled refreshments to be secured with more comfort and less crowding than on some other occasions. The attendance was large and the whole entertainment very successful.

The Fine Art Society.

AT the Fine Art Society's Galleries is to be seen a collection of water-colour drawings by Mr. Alberto Pisa, exhibited under the title "The Cities of Central Italy." The artist, though for many years a resident in London, is a native of Ferrara, and has returned to his native land for the subjects of this collection of seventy-one drawings. The interest of the collection is perhaps architectural and topographical rather than artistic; that is to say, the drawings do not display any special power as examples of water-colour art, but they form an interesting series of illustrations of ancient architectural monuments of Italy, treated with a style which is sufficiently truthful in representation without becoming hard or realistic. Among the best are several of the illustrations from Perugia, especially "Roman Aqueduct, Perugia" (16), "Porta S. Susanna" (19), and the Arch of Augustus, in the same venerable city. Several illustrations of Siena Cathedral are very good; also "The Duomo, Orvieto" (25), the "Marcella Fountain at Assisi (40), the Brick and Marble Arcade in S. Maria Novella, Florence (42), the view of San Francesco, Assisi, and "The Back of the Church of Santa Maria Novella" (48), with its curious octagon brick columns with shields on the capitals. In the view of the "Piazza San Marco, Venice" (29), in which the lower portion of the campanile is seen, the long narrow pilasters are hardly sufficiently defined to give the impression of the structure. But architects should find much to interest them in the collection.

Messrs. Tooth & Sons' Gallery.

THE winter exhibition at Messrs. Tooth & Sons' Gallery in the Haymarket includes one of the finest works by M. Harpignies that we remember to have seen—"Château Gaillard" (29), a foreground of trees and foliage beyond which is a river and the old château, light in the sunshine. The building is not *quite* upright—even the greatest landscape painters do not seem to get over that little difficulty, but it is only a minor feature in the composition. The other central work on the walls is M. Bouguereau's "L'Élégie" (43), seen some two or three years ago on the Academy walls; a picture which represents the best of Bouguereau's art, full of the superficial beauty of colour and sentimentality, but totally devoid of feeling. Then there is M. Seignac, whose "Craintive" (4) is Bouguereau at second hand; equally sentimental and conventional, and not so fine in technique. A comparison with Millais' "Castaway," which hangs a few feet from this, affords a good example of the difference between first-class and second-class painting. Landscapes are the strong point of the collection. Oakes's "Fording the Tidal Creek" (5) is rather mannered in the foreground, but is a fine work as a whole. It is interesting to compare Mr. H. W. Davis's early and late style of work in "A Siesta" (1) and "East of the Sun" (70); the former, in spite of a little hardness, is a picture with more earnestness in it than the later and more sentimental picture. Among other things is a powerful brown landscape by M. Jacque (21); Mr. Crofts's spirited and real "Hougoumont" (41); a capital bit of Venice by M. Gallegos (44); one or two heads by M. Henner and another (a better one) by M. Dagnan-Bouveret; one specimen of Herr Israels (77); a fine landscape by M. Lhermitte (76), and various perfect pictures of dogs by Mr. Blinks. There are too many of Mr. Leader's tame conventional landscapes, but in the largest work, "Hills and Crags of North Wales" (63), he rises above his usual level.

Maclean's Gallery.

THE most noteworthy things in the exhibition at Mr. Maclean's Gallery in the Haymarket are a large landscape by M. Harpignies—"Early Autumn," which we seem to remember at one of the Paris Salon exhibitions, and the late J. C. Cazin's beautiful and poetical work "A French Homestead," a landscape of quite unusual power and originality in style and colour, and which is alone well worth a visit to the exhibition. M. Lhermitte's "Noonday Rest" is a good example of his broad and masterly style, and there is a fine landscape by Wimperis. Among less important works the small landscapes by M. Lamoriniere are worth attention. The first room is occupied by a collection of etchings and slightly sketched crayon portraits of ladies by M. Helleu, who seems to be anxious to establish a *clientèle* here, as it is stated in the catalogue that he will visit London shortly to execute any commissions that may be received for portraits, so tha this exhibition is evidently a kind of display of his faculty in feminine portraiture. Whether he will be able to render the style of the London lady as faithfully and characteristically as he portrays the Paris lady, or whether English ladies will not find themselves too much Frenchified in his portraiture, is perhaps a matter of question, for the resolution of which we must wait till some of these hoped-for London commissions have been executed.

The Goupil Gallery.

THE Goupil Gallery has changed hands, and is now to be under the direction of Mr. William S. Marchant, late manager to Messrs. Boussod & Valadon; and the exhibition now on view is the first under the new management. It is not a very exciting one, unless for those who have a peculiar taste for what may be called the dark or smudgy school in landscape. The names however are good enough, including Mauve, Israels (who shows us, under the title "The Bather," the unwonted experiment of a nude figure), Maris, Corot, Bastien-Lepage, Harpignies, Troyon, &c. The Corots, however, are very small sketches, not of great value apart from the name. There is, however, a perfectly beautiful little Diaz, "The Forest Pool" (35), in his finest style; a fine work by Herr Israels, "Maternity," and two or three admirable pictures of winter effect by Mr. Fritz Thaulow. But on the whole a row of eminent names does not do away with the fact that most of them are attached to comparatively unimportant works. Bastien-Lepage's small but highly finished head of the present Sovereign, painted of course when he was Prince of Wales, is a remarkable work. But we shall hope to see better exhibitions than this in Mr. Marchant's gallery.

Socialist Art.

A CORRESPONDENT writes to us to know what the Editor of this journal meant, in his address to the Architectural Association School of Design published in our last issue, by his reference to the lamentations "of what may be called the Socialist school of critics" over the supposed death of architecture. The use of the word "Socialist" *en passant* was not intended with reference either favourable or the reverse, to any political or social theory of life, which was not the business of the address. It was merely used as characterising those who seem to think, as William Morris certainly professed to think, that architecture was an art emanating solely from the people; the work of associated craftsmen, in fact. That might very well be termed a Socialist view of art, as opposed to the view of an artistic conception as the work of an individual mind. The use of the word had no reference to any "platform" whatever.

THE GLASGOW EXHIBITION BUILDINGS.—A meeting of a special committee of the Corporation was held on the 23rd ult. to consider a proposal to retain permanently a portion of the exhibition buildings. There is a feeling that the Concert Hall and the Machinery Hall might be retained, and the committee decided to have a report prepared on these buildings.

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LETTER FROM PARIS.

THE "Vieux Paris" Committee has asked for the rebuilding of the monument erected in 1802 on the Place Dauphine to the memory of General Desaix, which was demolished in 1875 when Alphand undertook to clear the place in front of the façade of the Cour d'Assizes, which had just been completed from the designs of Duc. This monument, very dilapidated—a mediocre work by Percier—had been relegated to the storehouses of the Beaux-Arts, and its restoration, at a cost of 18,000 fr., would have made it a new monument of no historic interest. The financial argument has convinced the Committee, which has asked the Prefect of the Seine to arrange with the State to exchange the remains of the Desaix monument for the curious plans in relief which are preserved at the Invalides, and would be much more at their place in the Carnavalet Museum. Unfortunately, it is to be feared that these historic relics, especially the figure of the warrior with the Roman helmet who crowns the bust of the conqueror of Marengo, will not bear transport and will fall to pieces on the road.

For one monument disappeared how many others rise up on all hands against which the "Vieux Paris" Committee might well protest! While on the Champs Elysées, which the statue-mania has hitherto spared, they are erecting the monument of Alphonse Daudet, the garden of the Luxembourg continues to be encumbered with the effigies of authors and poets, some of whom little merit such an honour. Thus Ferdinand Fabre, author of some tolerable romances, who died recently, has already become a great man worthy of a marble statue. On a pedestal, designed by M. Pujol, a Languedoc peasant girl is seated at the foot of a column supporting the bust of the author (by M. Marqueste). It is sad to have to confess that Corneille and Racine are still forgotten.

The monument to Charles Garnier, who was a figure essentially Parisian, will not encroach upon any public garden. It will be placed in its right position adjoining the Opera House, which was his great work, and which will always be connected with his name. This monument is in progress, and will probably be placed in position next year, for the granite pedestal is to be sent from Scotland completely finished at the end of the present year; and M. Germain, the sculptor, has already modelled the ornaments for it, which will be cast by Messrs. Christiofle, and M. Thomas has just completed the two accessory statues.

At the Luxembourg Museum M. Bénédite is preparing an exhibition of the works of Félix Buhot, the engraver. It is a good idea, for this artist left a number of drawings, engravings, and etchings which are little known and are of great merit. Among them are some beautiful Normandy landscapes, picturesque corners of Paris, and also some interesting views of London, including some drawings of the Houses of Parliament. Besides this exhibition the Curator of the Luxembourg is arranging in the gallery of foreign painters a selection of works by English and American artists.

The Union Centrale des Arts Decoratifs has at last officially taken possession of the Pavillon Marsan, and will be able next spring to open the first part of its new museum.

At the Trocadéro Museum the gallery of megalithic and prehistoric monuments has recently been opened, and in a few days the public will be admitted into the ethnographic gallery, consecrated to France and her colonies.

Puvis de Chavannes has been dead for three years, and the mural paintings in the Pantheon after his cartoons are not yet finished. Cazin, who had been commissioned to finish them, has in his turn died, since when the cartoons have remained in the ateliers of the Louvre without any further decision being come to with regard to them. The selection of an artist to complete the work is no doubt a very difficult matter, but it is one which ought to be undertaken, and the Directeur des Beaux-Arts should inquire among the artists who were the constant assistants of the master, such as Alexandre Séon, the dreamy and mystical painter who was his favourite pupil, and whose works, recently collected in a private exhibition, impressed every one with their poetic charm as well as their purity of line.

As is well known, the painter Chenévard has instituted at the Ecole des Beaux-Arts some prizes of great value to be competed for, and which in the eyes of the young artists are almost as important as the "Concours de Rome." The twenty-five pupils whom the jury selects to take part in the final competition receive each a subsidy of 2,000 fr. independently of the prizes awarded in the final competition. The prizes are awarded for painting, sculpture, medal work, copper-plate engraving, and architecture. In this last division are five candidates, MM. Coutan, Ferret, Janssely, Prévot, and Hubanié.

M. Detaille is executing for the Hôtel de Ville two large paintings for the Salle du Budget, the sketches for which he has just submitted for approval. The first of these represents a scene of volunteer enlistment under the First Republic. The scene is on the Pont Neuf, where the volunteers are being enrolled in the midst of popular acclamations; the picture forms a kind of restoration of this corner of old Paris, with the red brick houses of the Place Dauphine, the Henri IV. statue surrounded with scaffolding, the quays lined with the old houses which have now disappeared. The other painting shows the Barrière de la Villette, at the moment when the Imperial army brings to Paris the standards taken from the enemy, and is received in state by the municipal authorities. This decoration, which will certainly rank among the finest of M. Detaille's works, will be completed by a ceiling with an allegorical design, a kind of equestrian trophy symbolising France triumphing over her enemies; a design which will exhibit the genius of M. Detaille in a new light.

CHELSEA, LITTLE CHELSEA, AND BROMPTON.

1801-1900.

No longer a "village of palaces" separated from the town by the Neat Gardens and the gently flowing West Bourne, Chelsea can now boast of three river bridges, a new parish church, a public free library, a polytechnic institute, barracks, a riverside embankment, and a theatre; it returns one member to Parliament and five to the School Board for London; we may epitomise its more modern history by saying that it is constituted a Metropolitan Borough under the London Government Act, 1899. Lysons records that in 1795 about 1,240 of the 1,350 houses in the parish were inhabited, the rest being for the greater part unfinished.

The earliest building project that comes within our theme consists of the laying out in 1800 of Chelsea Common, about 37 acres, for Whitehead's-grove (named after George III.'s builder), Waterloo-place, Marlborough-square, College and Blenheim terraces, and Leader, College, Francis, Oakham, and Keppel streets. Twelve years later a new burial ground was formed, and on October 12, 1820, was laid the first stone of the new parish church of St. Luke, built of Bath stone in the Late Gothic style, at a cost of about 30,000*l.*, by James Savage, *obiit* 1852, whose designs were chosen out of those of more than forty competitors. It has 2,000 sittings, is 187 ft. long, the stone roof is groined, and the pinnacled tower rises to 140 ft. On January 15, 1887, the late Metropolitan Board of Works agreed to contribute one-half of the net cost, being about 2,000*l.*, of the conversion by the Vestry of the disused graveyard into a public recreation ground.

Counter's Creek, Kensington Canal, Stanley Bridge, World's End, and Cremorne. — On November 30, 1897, the London County Council resolved to expend 60,000*l.* upon the construction of a pumping station at Lot's-road, named after "the Lots" or allotment grounds, for dealing with the flow of the low-level and Counter's Creek sewers, and relieving them in times of heavy rains. Counter's, correctly Caunter's, brook or creek ran from its source at the "Red House" on the Harrow-road, a few yards west from St. John's Church, Kensal-green, along the eastern side of the West London Railway, with tributaries from ponds at Portobello Farm and Notting Hill Barn, joined the Eel Brook at the Swan, Walham-green, and flowed into the basin of the Kensington Canal, south-west of Edwardes-square, and so along the south-eastern side of Lot's-road into the Thames opposite Battersea parish church. Known also as the Stanford brook, it is depicted in Joseph Salway's plan and profile survey of the Kensington Turnpike Trust, completed in 1811, as crossed by Stanley Bridge carrying Bridge-street (now Fulham-road) at an altitude of only 8 ft. 11 in. above high-water level. The Kensington Canal, opened in 1826, and closed in 1860 for an extension of the West London Railway, formed a boundary between Kensington and Fulham. Counter's Bridge has given place to Addison-road Bridge, between which and West Brompton station lay the great basin. Stanley Bridge is named after Stanley, or Stanley Grove, House, the home in 1815-22 of Sir William Richard Hamilton. In 1840 the National Society bought the house for their St. Mark's Training College, to which Blore added a quadrangle in about 1850. On the left hand of one going westwards from the bridge that crosses the railway is the site of Sandford Manor House, a home of Nell Gwynne, which, having been converted into a cask manufactory, was taken for the Imperial Gas and Coke Company's works. World's End, a favourite place of entertainment *temp.* Charles II., appears to have been a precursor of Cremorne Gardens, originally Chelsea Farm, and owned by Sir Richard Lyttleton, *obiit* 1774. The property then passed to Thomas, Viscount Cremorne, who died in 1813. Cremorne Gardens, situated between Battersea Bridge and Counter's Creek, were opened in 1843, and, after a not very reputable career, closed on October 5, 1877. Most of the ground was then taken by Mr. W. J. Bull, the orchid-grower and nurseryman, and having been sold in November, 1897, is now covered with streets. Sir Thomas More's epitaph in the (old) parish church no longer testifies to the dread in which he was held by heretics; in May, 1808, Cardinal Vaughan opened a church, the Convent of Adoration Reparatrice, erected on the reputed site of More's house in Beaufort-street, and gave it to the charge of a community of nuns that they might there pray day and night for the conversion of England to the Roman Catholic faith.

Cheyne-walk and the Embankment. — In Salway's Survey we see that Cheyne-walk then lay between the end of Robinson's-lane (Flood-street) and the engine-house opposite the (old) parish church, the present portion south-westwards to Battersea Bridge being named Lombard-street and Duke-street, with houses on both sides of the road, and one of them standing, within our own memory, across Lombard-street, two doors from Church-lane (Church-street). The road, having along the riverside a row of trees, wooden rails, and several sets of steps and "stairs" leading to the water, varied in altitude from 1 ft. 8 in. (south-west) to 4 ft. 9 in. (north-east) above high-water mark, and at high flood-tide presented a charming prospect. "Don Saltero's" is plotted as between the old Nos. 17 and 19; between Nos. 27 and 31 are the Bishop of Winchester's house and grounds; next to No. 35 is the Magpie tavern; the opening of Cheyne-row is between Nos. 44 and 45, and just opposite is the stone marking two miles from Buckingham Gate. Between the end of Lawrence-street and the churchyard wall stand the five houses of Prospect-place, on the site of the china factory. At the meeting of Lombard and Duke streets is Chelsea Ferry Stairs, nearly opposite the end of Danvers-street; beyond the bridge-foot are Lindsey-row and Davies-street, since incorporated with Cheyne-walk. Close to the former Bishop's Stairs is the present Oakley-street, of which the lower end has been opened out with a crescent (Pennethorne) as an approach to Albert Bridge. Alston, formerly Shrewsbury, House, built about 1540 and pulled down in 1813, at the remoter end of Cheyne-walk had been during a long period a residence of the Earls of Shrewsbury, and was devised by "Bess of Hardwick" to her younger son William, from whom it passed to Joseph Alston, created a baronet in 1682. The house, which was commonly, albeit erroneously, identified as Sir Thomas More's, was subsequently converted into a stained-paper factory. At the corner (south-west) of Lawrence-street is the Cheyne Hospital for Sick and Incurable Children (Mr. Beasley, architect, 1888), which occupies the site of the china manufactory which William Duesbury, agreeably with the covenants of his lease, demolished in 1784 when he removed to Derby. The ovens of his predecessor Nicholas Spremont were in the present Lawrence-street, and the warehouse in Justice-walk. Duesbury's showrooms were taken in 1786 for Echardts and Woodmason's stained and stamped paper manufactory, and afterwards by Harwood & Co. In 1791 Echardts established at Blacklands House their factory of painted silk, varnished

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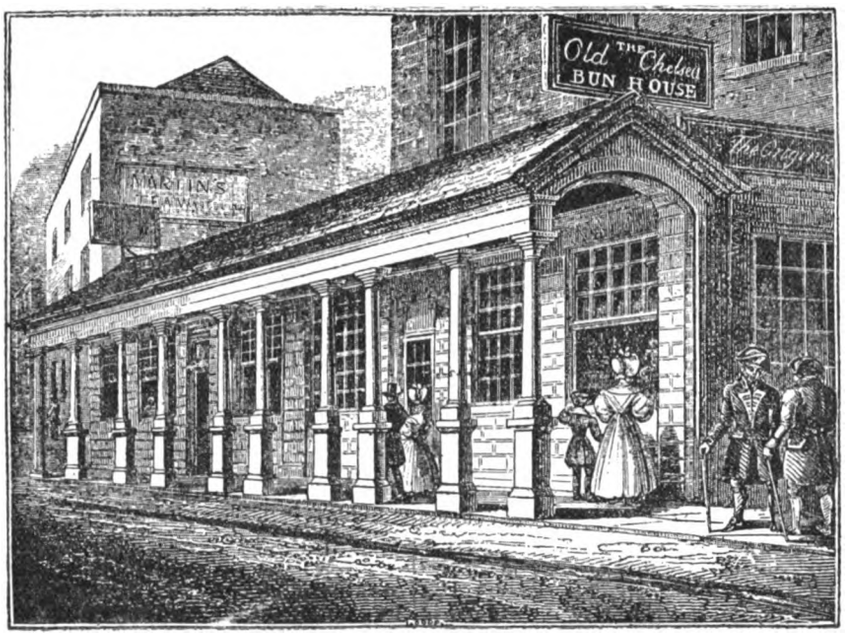
cloths, &c., since Cooke & Hinchcliffe's stained-paper works. Nos. 7-11 [August 11, 1888*] were rebuilt after Mr. F. Heming's plans and designs, upon the site of the great garden of Winchester House and of some old and historical houses, one of them being the Gothic House as altered and remodelled by the elder Pugin; the house [January 2, 1897; No. ix., "Sketches of London Street Architecture"] on the site of the old Magpie and Stump, formerly the Magpie, burned down in 1886, and Nos. 38-9 [January 19, 1901], their decorative frieze being by Mr. F. C. Varley, are by Mr. C. R. Ashbee. Mr. E. T. Hall is the architect of the Children's Home, in Milman's-street, for the St. George, Hanover-square, Guardians, built by Messrs. Foster & Dicksee, of Rugby, who contracted for 12,917*l.*, on the site of Nos. 35-7-9-41, Milman's-street, and Nos. 5-6-7, Eign-cottages.

The embankment of the Thames between the Royal Military Hospital and Millbank was carried out about fifty years ago. Under their Act of July, 1868, 31-2 Vic., cap. 135, the late Metropolitan Board of Works obtained powers for a continuation westwards to Battersea Bridge. The work, begun in July, 1871, and finished in May, 1874, was executed by W. Webster, contractor, at a net cost of 269,591*l.*, and forms a dam for the low-level sewer to Barking Creek. The south-western portion absorbed most of Lombard-street and Danvers-street, with Danvers and Old Ferry wharves. The new road from Cheyne-walk to Victoria Bridge, being rather more than three-quarters of a mile long and 70 ft. wide, passes along the verge of the Physic Garden and the Royal Hospital grounds, which until that time had formed the fore-shore of the Thames. It completes a riverside road which, with a break at Westminster, extends for four and a half miles from Battersea Bridge to Blackfriars Bridge. The London County Council's Bill of 1897 for lengthening the Embankment in a curve to the east ends of Cremorne and Lot's roads, at an estimated cost of 64,000*l.*, was strongly opposed, mainly upon æsthetical grounds, before a Select Committee of the House of Commons, who unanimously decided against the measure. In August, 1899, the London County Council agreed to contribute 4,400*l.*, being one-half of the net cost of widening Cheyne-walk between Beaufort and Milman's streets, as undertaken by the Vestry, whose scheme provided for setting forward the river wall so as to increase by 25 ft. the width of Cheyne-walk at the end of the Embankment, the additional width gradually decreasing to 6 ft. at Lee and Jerdein's Wharf.

Queen's-road West and the Physic Garden.—On March 3, 1900, the London County Council agreed to contribute one-half, or not more than 1,000*l.*, of the net cost of the widening to at least 40 ft. of Queen's-road West at the Physic or Botanic Garden as undertaken by the Vestry. The road has absorbed Paradise-row and Royal Hospital-row, and separates the hospital from the open space of Burton's Court so as to form a continuous thoroughfare from Pimlico-road, formerly Grosvenor-row, and Queen-street to Cheyne-walk. At its south-western end and near the site of the Swan riverside tavern is the Physic Garden, a freehold of three and a half acres originally leased to the Apothecaries' Company in 1693 by Lord Cheyne for a barge and boat-house, and conveyed to them by gift of Sir Hans Sloane by an indenture of February 28, 1721-2, for the cultivation of medicinal herbs and simples. In 1898 the Company applied to the Charity Commissioners for relief from their trusteeship of the garden, valued at 30,000*l.*, finding themselves unequal to the charge upon their exiguous resources. In December of that year the Charity Commissioners framed a scheme for the administration of the charity and its endowments, which yield about 950*l.* per annum, and established a committee of fifteen persons to maintain and equip the garden as a place of scientifical instruction and research in systematical botany and vegetable physiology. The greenhouse and library were built in 1732 by Edward Oakley.

Gordon House.—In the Stableyard adjoining the Royal Hospital, south-west, stood the house inhabited by Sir Robert Walpole, who enlarged the property by purchasing some land from the Gough family. In 1808 the Government repurchased the property and built a large infirmary there after the designs of Sir John Soane, who, as Surveyor of the Hospital, had an official residence exactly opposite No. 4, Paradise-row (Queen's-road West). The greater portion of the remaining grounds had been leased in 1791 for a term of ninety-nine years by George III. to his Equerry, General Gordon, who built the house. When the lease expired in March, 1890, the estate reverted to the Hospital Commissioners. In that year the Royal Military, and in 1891 the Royal Naval, Exhibitions were held in the grounds (three and a half acres) of Gordon House and in an adjoining plot of four acres. After the sale in December, 1891, of the materials of the two exhibitions, Gordon House became an infirmary of the Royal Hospital; the grounds were taken for the erection, 1895-8, of twenty-three houses, Chelsea Embankment-gardens, by Messrs. J. Allen & Sons, at a cost of 92,000*l.*, and a block of eighteen sets of flats, Chelsea Embankment-court, by Mr. H. Lovatt, at a cost of 41,000*l.*, from Mr. Delissa Joseph's plans and designs [February 5, 1898].



The Old Chelsea Bun-shop. [From a print in *The Mirror* (1839).

Ranelagh.—In its course from Knightsbridge to Grosvenor, also known as Bloody, Bridge on the east side of Sloane-square (formerly Blacklands), and thence to the river, the placid West Bourne entered the Thames at Ranelagh Stairs, close to where is now the disused Victoria steamboat pier. Upon its right bank stood until 1806 Ranelagh Gardens—watered with a canal from the stream—on the site of the present "Old Men's Ground" (next, south-east, to the pensioners' graveyard), which was added in that year to the Royal Hospital grounds. The "Old Men's Ground" lies along the south-west side of Chelsea Bridge-road, which separates it from the Guards' Barracks, behind which is the course of the West Bourne. A painting by Canaletto, and engraved by Parr in 1751, of the interior of the Rotunda was acquired for the National Collection in January, 1895. It is one of the three that he is known to have painted of the Rotunda. The picture is of intrinsic interest inasmuch as it delineates the original orchestra, octagonal on plan and supporting the flat roof, after its conversion into a fireplace; and the later orchestra, which, with the organ, by Byfield (1746), was built over one of the four entrances, 1769. William Jones, architect to the East India Company, designed the Rotunda for William Crispe and James Myonet; his adopted designs, with sections and a plan, engraved by F. M. La Cave, were published on June 30, 1742. The Rotunda, being somewhat similar in appearance to General Scott's Royal Albert Hall, had an exterior diameter of 185 ft., a rusticated arcade on the ground level carrying a gallery, and a truncated roof, apparently of slate, sloping to the clearstory. The pediments of the four entrances, after the Doric order, rose to the base of the top story. The interior diameter was 150 ft. Over the forty-eight open boxes—Walpole calls them "little ale-houses"—was a gallery, and above that the clearstory, lighted with sixty round-headed windows. The flat ceiling, coved at its edges, was groined over each of the windows and the eight sides of the central orchestra, which rose in two stages. La Cave's later "Perspective View of the Amphitheatrical Building . . to be erected at Chelsea, designed by Wm. Jones, archit., 1748," seems to be a design for altering or rebuilding the original structure, for it depicts the central orchestra as rising by a lantern and a cupola through a large round opening in the roof, and the roof as raised upon an added story. La Cave's later view shows Ranelagh House due north of the Rotunda, the "Great Barr," a covered way which joined the two, and, on the north-west, "boxes for gentlemen to smoak in."* The centre of the Rotunda lay 350 yards due north from the river-end of the broad walk which leads to the central front, facing south-east, of the Hospital. The gardens had belonged to the house which Richard, third Viscount and first Earl of Ranelagh, Paymaster-General to the Forces, designed and built for himself in 1690, having obtained from the Crown two leases of about 25 acres at a total rent of 45*l.* 11s. 6d. per annum, which eight years afterwards he exchanged for a grant in fee at an annual rent of 5*l.* James Hamilton's Survey of 1664, as corrected to 1717, plots the "Earl of Ranelagh's house and gardens." The house appears in the background of the view in our illustration of July 6 last, and its oaken staircase is refitted in No. 51, Harley-street [Mr. F. M. Elgood, July 27, 1895]. An Act of 1730 vested the estate in trustees; in 1733 the house and grounds were sold in lots; two builders, Swift and Timbrell, bought most of the property for 3,200*l.*, and leased their purchase to Lacy, patentee of Drury-lane Theatre, and Solomon Rietti, who intended to open the garden as a kind of winter Vauxhall. Myonet and Crispe revived the scheme, and on April 5, 1742, opened the Rotunda as a morning resort. In May the evening concerts began, with two ridottos weekly, a ticket costing one guinea. The building and disposition of the gardens (by Capon) cost 16,000*l.*, writes Walpole to Mann in that year. Dr. Burney was organist in 1760. On June 29, 1764, Mozart, being then eight years old, played some of his own pieces upon the organ and the harpsichord for a charity. In May, 1767, the Catch Club gave their first entertainment, for which Arne composed the choral and instrumental music. Ranelagh attained its highest fame in the period 1775-85, under the patronage of Georgiana, Duchess of Devonshire and the Duchess of Ancaster, when the visitors used to arrive at mid-day and passed most of their time in walking round and round inside. Ranelagh was opened for the last time on July 8, 1803, and on September 30,

* Dates within *square* brackets relate to illustrations in the *Builder*.

* See also the large views by Rooker, after Canaletto, 1751; W. Newbond's perspective of the interior, 1761; in the Soane Museum, "a perspective view as intended to be finisht," and "a geometrical section with the orchestra and orthographical plan of the amphitheatrical building;" and the view reproduced in the *Builder* of July 6 last.

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1805, an order was made for pulling down all the buildings, the organ being removed to Tetbury Church, Gloucestershire. Until recent years some of the old lamp-irons still remained upon the trees. In 1854 were pulled down a large house, built over part of the site in the south-east corner, and Clarence House, for the laying out of the new road to Victoria Bridge. In Hamilton's plan, 1664-1717, which we illustrate, will be noticed the Creek (West Bourne), the Earl of Ranelagh's house and gardens, Stone-bridge, the stable-yard, College-court, Chelsea-common, and several other places we mention.

The Bridges.—In 1881 the late Metropolitan Board of Works obtained powers to pull down Battersea Bridge, as being unsafe. The design of the wooden bridge, being very similar to that of old Putney Bridge [January 7, 1888], has been attributed to Cheselden, surgeon of the Royal Military Hospital; he, however, died in 1752. The bridge was built in 1771-2 to replace Chelsea Ferry, established *temp.* James I., for John, first Earl Spencer, Lord of the Manor of Battersea and Wandsworth to which the ferry belonged, and fourteen other proprietors, who subscribed 1,700*l.* apiece, after the designs of Henry Holland (*obiit* 1806), at a cost of about 23,000*l.*, by Phillips, George III.'s carpenter. On May 24, 1879, Battersea and Albert Bridges were freed from toll at an outlay of 170,000*l.* In May, 1886, Messrs. Williams, Son, & Wallington ratified their contract for 143,000*l.* to build the new bridge, designed by Sir Joseph Bazalgette and Mr. E. Bazalgette, and opened on July 21, 1890; we illustrated and described a portion of the working drawings on July 26 of that year. Chelsea, or Victoria, Suspension Bridge, by Page, engineer to the Office of Works, was constructed in Edinburgh and built in 1856-7, at a cost of 80,000*l.* It was freed from toll, for 75,000*l.*, on May 24, 1879. The southern abutment marks the site, in Battersea Fields, laid out by the late Arthur Cates as Battersea Park, of the old Red House. Albert Bridge, opened on August 23, 1873, was taken over in or about 1881 by the late Metropolitan Board of Works, who replaced its steel-wire cables with solid steel links. Pennethorne made the approach from the northern bank, designing the pleasing feature of a spacious crescent at the end of Oakley-street. Messrs. Henderson & Fox built the Victoria railway bridge, since widened, for carrying the London and Brighton line to Victoria from the former terminus between Victoria-road and the Vauxhall and Southwark Waterworks.

Queen's-road, Burton's Court, Franklin's-row, &c.—Paradise-row, where many of the old houses yet survive, is now Queen's-road West; Queen's-road has been laid out through the Hospital grounds, and between the two hospital gates, so as to run in alignment with Paradise-row and Royal Hospital, since Jews', row (now the south-western part of Pimlico-road). In Royal Hospital-row, along the side of the pensioners' burial-ground, and Paradise-row were as many as ten public-houses—mainly supported by the pensioners and their friends.* Franklin's-row, depicted in Wilkie's painting of the pensioners reading the Waterloo gazette, and Garden-row, separated by Turk's-row, lay along the north-eastern side of the present open space named Burton's Court. Garden-row, formerly the hospital of the Royal Military Asylum, and Franklin's-row have lately disappeared, forming the sites of two blocks of residential flats, Burton-court, separated by Turk's-row—Mr. Paul Hoffmann. On the northern side of Turk's-row is St. Jude's Church, by Basevi, 1842. In 1887 the War Office, at an outlay of 800*l.*, converted the large open space of Burton's Court into a recreation ground for the Guards quartered in London. Burton's Court, about twelve acres between Queen's-road and St. Leonard's-terrace, was formerly known as Great, or College, Court, constituting, until the laying out of Queen's-road, the main approach to the Royal Hospital from the north-west. The trees in Royal-avenue, formerly White-stiles, beyond, support the tradition that Queen Anne intended to lay out an avenue of lime and chestnut trees through Burton's Court and the fields to Kensington Palace gates. Looking up the avenue, one sees in the distance the tower of the Imperial Institute. The hospital buildings gave meaning and dignity to the garden, whose broad gravel-walk was a chosen resort of the pensioners; but they and the public alike are now excluded from a space that was bought in 1662 with public money, by a high-handed ordinance similar to that by which several acres of the once public grounds of the hospital grounds have been—in violation of an arrangement made in 1850—appropriated for the private enjoyment of the hospital governing staff. The adjacent Royal Military Asylum, renamed in October, 1892, the Duke of York's Royal Military School, was built in 1801-3, John Sanders being the architect.

Horwood's and Salway's surveys show *two* Chelsea Bun-houses, Nos. 7 and 10 on the north-western side of Grosvenor-row, and each with its colonnade over the footpath. Grosvenor-row (since Pimlico-road) extended from Royal Hospital-row to the south-western end of Ebury-street; on its south-eastern side, close to the left bank of the West Bourne, stood the Nell Gwynne tavern, opposite the Cheshire Cheese; at its north-eastern end was the watch-house. What is commonly described as the old "original Bun-house," whose renown had been established before the close of the seventeenth century, survived until the sale of its materials and "museum" on April 13, 1839; see the *Gentleman's Magazine* of May, and the wood-cut in the *Mirror* of April 6, of that year.

On July 23, 1891, the King laid the first stone of the South-West London Polytechnic Institute in Manresa-road—J. M. Brydon, *obiit* 1901 [March 21, 1891], the total estimated cost of the scheme amounting to 100,000*l.*, towards which several contributions were made by private individuals and public bodies, including the site, valued at 10,000*l.*, by Lord Cadogan, and a conditional grant of 50,000*l.* by the Charity Commissioners out of the City of London Parochial Charities Fund. To the building, which cost about 25,000*l.*, a new wing was recently added by Mr. F. G. Knight. The Public Library—J. M. Brydon [January 24, 1891], built by Messrs. Holloway Bros., and opened on January 21, 1891, stands on the site (Lord Cadogan's gift) of the studio of the late J. B. Philip, sculptor. In the Queen Victoria Gallery—J. M. Brydon, added in commemoration of Queen Victoria's Diamond Jubilee, and opened on December 4, 1899, is a valuable collection formed by the Commissioners of Public Libraries of portraits and other memorials associated with bygone Chelsea. The Vestry Hall, built at a cost of about 15,000*l.* by Mr. Charles Wall, after J. M. Brydon's designs, upon a site given by Lord Cadogan, is illustrated, with sections and details, in our columns of May 2, 1885.

Sloane-street, Hans-place, Cadogan-square, Sloane-square, and the Cadogan Estate.—Sloane-street, Hans-place, and Upper and Lower Cadogan-place were laid out by Henry Holland along the eastern side of what appears as open ground as late as the time of Mogg's map of 1841. Holland built the Pavilion in Hans-place for his own occupation, and died there on June 17, 1806. Holy Trinity Church, Sloane-street, 1828-30, by James Savage, has been replaced with a notable and characteristic example of the inventive genius of J. D. Sedding—*obiit* April 7, 1891—built by Messrs. Higgs & Hill, and consecrated on May 13, 1890 [October 6, 1888; October 12, 1889 (bay of nave arcade); January 4 and June 21, 1890.] Lord Cadogan, patron of the benefice, contributed 22,000*l.* towards the cost of the fabric begun, on the site of the former church, in 1888. The nave and chancel, 60 ft. wide, extend to an unbroken length of 180 ft.; the south and north aisles are 12 ft. and 40 ft. wide respectively; an arcade of six lofty arches, spanning 30 ft., is carried by stone piers, 4 ft. in diameter, and a range of pillars, of fine red brick, divides the north aisle, appropriated for daily services, into two sub-aisles. The cost of fully completing and decorating the edifice is computed at 72,000*l.* Some of the original houses in Sloane-street have been rebuilt—Nos. 27, 28, 29, 30, for instance, are by Mr. Frederick G. Knight; others have been re-fronted; of the latter we may cite No. 64, re-faced in Portland and blue Pennant stone, and No. 63, of which the stock-brick walls remain (a not unwelcome relief from the mania for red brick), Monk's Park stone having been used for the window dressings, and massed at the entrance and in top story—both by Mr. Fairfax B. Wade [January 29, 1898, and February 27, 1897; Nos. xxiii. and x., "London Street Architecture"]. Some houses on the southern side of Pont-street, occupying the site of old "Prince's Ground" [November 27, 1886], are by Mr. E. T. Hall, who also planned and designed the houses in Cadogan-square and "The Mansions," Sloane-gardens, built by Messrs. Foster & Dicksee, and Messrs. Langdale, Hallett, & Co., which we illustrated on June 2, 1888, January 19, 1889, and (plan) January 26, 1901. St. Columba's Church of Scotland in Pont-street [March 29, 1884], built by Mr. E. Lawrence, is by Mr. J. MacVicar Anderson. In Cadogan-square Messrs. Ernest George & Peto were architects of two houses [May 15, 1886] built by Messrs. J. Simpson & Son for Colonel Thynne and Mr. T. A. De la Rue, the Gothic house is by G. E. Street (*obiit* 1881), and Lord Albemarle's, with others, are by William Young (*obiit* November 1, 1900), who also planned and designed Chelsea House, in Cadogan-place, for Lord Cadogan, with several mansions upon the Cadogan estate. In 1805-7 were built the Hans Town Assembly Rooms in Cadogan-place, by P. F. Robinson (1776-1858); the Racquet Court and most of "Prince's" were pulled down in 1886, and twelve years ago the club settled at Knightsbridge; St. Saviour's Church, Hans-place, is by George Basevi the younger, 1840. In this quarter several houses, including a row of eight in Hans-crescent, by Messrs. Read & Macdonald [March 20, 1897, No. xi., "London Street Architecture"], were built for the Belgravian Land Company, who have made extensive improvements, pulling down "slums," widening streets, and building houses of good design. A corner house in Cadogan-gardens, a new thoroughfare, is by Mr. MacMurdo [October 7, 1899, No. xxxiv. of our Series]; Farm House in Pont-street (1885) is by Mr. C. W. Stephens [August 7, 1897, No. xvi.]; Hans-crescent Hotel, opened in May, 1896, and since enlarged, is by Messrs. Read & Macdonald, the builders being Messrs. Stephens, Bastow, & Co., of Bristol. In Hans-road are two houses by Mr. C. F. A. Voysey, and No. 12, built in 1893 by the then firm of MacMurdo, Hornblower, & Walters [September 19 and August 29, 1896, Nos. iv. and v. of our Series]. The theatre, opened in the former chapel in Lower George-street, Sloane-square, on January 25, 1871, by the late Miss Litton, gave way in 1887 to extensive improvements on Lord Cadogan's estate, and was replaced with the Court Theatre designed by Mr. Walter Emden and Mr. W. R. Crewe, jointly, for Mrs. John Wood and Mr. Arthur Chudleigh, and opened on September 24, 1888. For rebuilding, with new streets, on the Cadogan estate, begun in 1886, were removed many thoroughfares, comprising George's-place, Leete-street, Grove-place, Blackland's-street, Walker's Cottages, Blackland's-court, Moss-place, Lower Sloane-street, Chelsea Market, Little and Lower George-streets, Evans' Cottages, Union-place, Wood-buildings, and a part of King's-road. All that property, together with the Manor of Chelsea, became vested in Charles, second Baron Cadogan, on his marriage with Elizabeth, daughter and co-heir of Sir Hans Sloane. A group of twenty-eight mansions and seventy flats in Sloane-court [February 4, 1899] and the flats, Nos. 21 and 23, Cadogan-gardens, are by Messrs. Rolfe & Matthews; for another block of flats in Sloane-court—Mr. Paul Hoffmann, the tender of Messrs. J. Grover & Sons, for 18,178*l.* was accepted in February, 1898.

Notabilia.

Churches.—St. Simon Zelotes, Cadogan-square, 1858-9—Peacock. St. John, Ashburnham-road, 1876—Newman & Billing. Christ Church, 1839, new chancel, organ chamber, and choir vestry—Mr. J. A. Reeve. Our Most Holy Redeemer, Upper Cheyne-row [October 12 and 19 and November 16, 1895]—Mr. E. Goldie. Holy Trinity, Sloane-street; east window—Sir Edward Burne-Jones; most of the metal work, the lectern, front panels of choir stalls, and statuettes of saints—Mr. F. W. Pomeroy; scheme of decoration, Lady Chapel—Mr. C. Whall, Mr. H. Wilson, and Mr. L. Davis. St. Luke (new) altar-piece—James Northcote, R.A.; the painting of "Time, Death, and Judgment" (a replica)—Mr. Watts, R.A.; windows—Mr. E. Frampton. St. Matthew, Oakley-square, 1856—J. Johnson; and memorial window to the late Rev. E. Phillips—Mr. E. Frampton. Park Chapel, originally built for French Protestant refugees, since enlarged, restored in 1880 by S. Bannister;

* In Paradise-row: the Fox and Hounds, Green Dragon, and George and Dragon. In Royal Hospital-row: the Royal Hospital (at the corner of Franklin's-row), General Howard, Snow Shoes, General Elliot, Recruiting Sergeant, Mermaid, and Duke of York (by the corner of White Lion-street).

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stained-glass windows—Gibbs & Steward; to be rebuilt.

Infirmary, Chelsea Hospital, 1809—Sir John Soane. The Jenner (incorporated in July, 1891, as the British) Institute of Preventive Medicine, 1895-6—Mr. A. Waterhouse, R.A. The Clock House and the Old Swan House—Mr. R. Norman Shaw, R.A. River House, completed in 1879—Messrs. Bodley & Garner. Sir Florence Shelley's Theatre, west side of Tite-street (formerly Calthorpe-place), sold in October, 1896, and the site taken for Shelley-court. Victoria Hospital for Children, established in Tite-street in 1866; the out-patients' department and nurses' home, opened in July, 1896 [June 27, 1885, and July 3, 1886], built by Mr. Chas. Wall—Messrs. H. Saxon Snell & Son. Cheyne Court, 1891-2—Mr. F. Hemings. The White House, rebuilt; confer Thomas Girtin's water-colour view which Turner considered as excelling his own work. Memorial tablet in lead to Turner at No. 119, Cheyne-walk—Mr. Walter Crane. Cheyne-row (built in 1708), No. 24 bought for 1,750*l.* as a memorial to Carlyle and his wife, marble bust—D. W. Stevenson, R.S.A.; statue in public garden—Sir J. E. Boehm. Memorial fountain to D. G. Rossetti in the public garden opposite Queen's House, No. 10, Cheyne-walk—Mr. J. P. Seddon; the quarter-length bronze figure, in alto-relievo—Ford Madox Brown [April 17, 1886]. Bull-alley, renamed, 1845, Stamford-road. Princes-street, renamed Rawlings-street; Old Church House [February 5, 1890]; the Artists' Houses, studios—E. W. Godwin. Markham-square, site of Morris's nursery, formerly Box Farm; eight studios, Chelsea-reach—Mr. W. I. Chambers. Improvement and enlargement of the Chelsea Hospital for Women, 1899—Mr. Wm. Emerson. Extensive business premises for Mr. Peter Jones, King's-road, Sloane-square, and Symons-street—Messrs. Perry & Read [January 19, 1889]. Guinness Trust Buildings, 1893—Mr. M. E. Macartney. Additions to Whitelands Training College, 1890-1—Mr. C. Pemberton Leach. Chelsea Conservative Club, 193, King's-road, 1887-8—Messrs. Karslake & Mortimer. Blocks of residential flats, east side of D'Oyley-street, 1898, and on site of Nos. 10-4, Sloane-terrace, 1896—Messrs. Bourchier & Galsworthy.

Brompton and Little Chelsea.

An excellent map of London, published in 1836 for the Society for the Diffusion of Useful Knowledge, delineates a few scattered houses in Little Chelsea, Brompton, and Earl's Court. Those houses excepted, nearly all the land on the remoter side of Fulham-road as far as Knightsbridge, Kensington, and the Kensington Canal is open ground, consisting mainly of nursery and market gardens. Redcliffe-gardens has replaced Walnut Tree-walk; Roland, Cranley and Drayton gardens, with the Boltons, are built over Brompton Heath. Between Marlborough-road (formerly Blacklands-lane) and Hans-place are a long pond (Cadogan-square), the Wellington cricket-ground and extensive nursery gardens, now traversed by Pont and Walton streets. Horwood, 1794, shows all vacant ground beyond King's-road, with Blacklands (Sloane-square) and the Marlborough tavern and its cricket-ground. In 1819 he plots the beginning of some houses on Chelsea Common, which covered thirty-seven acres south of Blacklands-lane, together with Marlborough-square, College-street, and Keppel-street (Blacklands-lane) as then laid out. The Hermitage where lived Mme. Catalani, was pulled down in 1844 for Grove-place. In that same year, on July 11, the late Prince Consort laid the first stone of the Consumption Hospital (by Francis), built upon the site of Curtis's botanical garden, and enlarged about twenty years ago. Curtis was the author of "Flora Londinensis" and projector of the *Botanical Magazine*. A plan of his garden, in the space between Sloane-street and Cadogan-place, is in the *Gentleman's Magazine* of August, 1810. The new hospital buildings on the south side of Fulham-road were erected from the designs of T. H. Wyatt, *obit* 1880 [November 22, 1879]. Opposite Trafalgar-square is the block comprising the home for nurses, probationers, and servants, Mr. E. T. Hall [August 19, 1899]. Pelham-crescent, Sydney-place, Thurloe-square, Brompton (now Egerton) crescent, &c., were laid out by George Basevi the younger (*obiit* October 16, 1845), after his appointment in 1829 as surveyor to Smith's Charity estate and the adjoining Alexander estate. The Cancer Hospital, founded in Cannon-row, Westminster, by Dr. Marsden in 1851, was removed to Hollywood-road, Brompton, and thence to the buildings erected by Messrs. Lawrence at a cost of about 7,000*l.* from John Young & Son's plans and designs, Mr. D. Mocatta being honorary consulting architect [April 28, 1860]: Mr. Alexander Graham's additions are illustrated in our columns of September 26, 1885. We may here mention that No. 24, Alexander-square, built 1827-30, was the residence of George Godwin, *obit* January 27, 1888, during a considerable portion of the time he edited this journal. He was architect of Brompton Parochial Schools [January 4, 1845]; of St. Mary Church, with the sedilia, in the Boltons [October 19, 1850], enlarged in 1872 by Peacock; and, in conjunction with his brother, Henry Godwin, of Redcliffe-mansions [February 11, 1871], upon an estate laid out by Cubitt and McClymont in 1861-71.

In Fulham-road, at the corner of Church-street, is the burial-ground of the Westminster congregation of Jews, established there in 1816, and improved by the Metropolitan Public Gardens Association in 1898. Opposite stood, until 1848, the Queen's Elm turnpike, named, it is said, after an elm tree beneath which Queen Elizabeth took shelter from a shower when walking with Lord Burleigh, who lived at Brompton Hall. The parish records of 1586 cite "the Queen's tree at the end of the Duke's-walk," and in 1687 the highway surveyors are amerced five pounds for not sufficiently mending the highway from the Queen's Elm to the bridge and from the Elm to Church-lane. The crossroads were subsequently called "Nine Elms" from some trees planted by one Bostocke around the older one. About a furlong distant are Elm Park-gardens, laid out over the site of Chelsea Park, plotted in Crosse's map, 1836, which formed part of the Sand Hills, an unenclosed tract that belonged to Sir Thomas More. In 1625 the Lord Treasurer Cranfield, Earl of Middlesex, enclosed about 32 acres with a brick wall. Having belonged, in 1717, to the Marquis of Wharton, the park (see Hamilton's plan, in our sheet of illustrations), was leased for 122 years to, and planted with mulberry trees by, a company for rearing silkworms and manufacturing silk under a patent taken out by John Appleton in 1718. The scheme soon came to nought. The mansion (standing in 1860) was built for W. Broomfield, an eminent surgeon, and latterly belonged to Sir Henry Wright Wilson, Bart. Drayton-gardens, opposite Chelsea Park, has supplanted Thistle-grove, where lived John Burke, the genealogist, and J. P. Warde, the actor (*obiit* 1840), whilst just beyond, at the corner of Park, formerly Lovers', walk, where began the village of Little Chelsea, the Goat in Boots public-house—whose sign Morland reputedly repainted—was rebuilt, together with three adjoining houses and shops, in 1888-9, Mr. T. H. Smith being the architect and Messrs. Turtle & Appleton the contractors [January 19, 1889]. Brompton Manor House, afterwards Manor Hall, where Mme. Vestris had her education, was standing sixty years ago on the north side of the road to Fulham, at the corner of the present Redcliffe-road. Having been occupied some thirty-five years since as St. Phillip's Orphanage, it has been rebuilt.

The Oratory.—In May, 1899, the Fathers of St. Philip Neri celebrated the first jubilee of their labours, which they had begun in two houses rented by Father Gordon, Father Faber (*obiit* 1863), and others in King William-street, Strand, where they converted the back premises into a chapel, of which the site was afterwards taken for Toole's Theatre, that has lately been demolished for an extension of Charing Cross Hospital. Three or four years afterwards they migrated to Brompton, where, on the site of Blemell's House, along the west side of the avenue of lime trees leading to Holy Trinity Church (1820-9, Professor Donaldson, restored 1880 by Sir A. W. Blomfield), new buildings had been built for them by Scoles, and opened on March 22, 1851. In April, 1884, was opened the permanent Oratory Church, erected after the designs (selected in competition) of H. A. K. Gribble, *obit* March 26, 1895. The south front, begun in 1892, was finished, the two towers excepted, in 1895 by Mr. Shaw, clerk of the works for carrying out Gribble's original designs, which included a stone lantern as the crowning feature; but the outer dome, having a framework of steel, is by Mr. George Sherrin, the architect nominated, we gather, by the donor of that portion of the fabric. The figure, 9 ft. high, of the Virgin above the central gable is by Mr. Collett.

In 1856 the St. George, Hanover-square, Union Guardians pulled down Shaftesbury House for their workhouse buildings. Mr. E. T. Hall was the architect of the new infirmary, for the enlargement of which was scheduled in February, 1898, some adjoining property in Fulham-road and Victoria-grove. The St. George, Hanover-square, Vestry had bought the property in 1787, from William Virtue, for an additional workhouse, the Act in that behalf declaring the house and grounds should be in St. George Parish so long as it served that purpose. The house, notable for its interior and charming old-fashioned garden (see the cuts in the "Art Union," 1848, and those by F. W. Fairholt in Croker's "Walk from London to Fulham," edit. 1860), was purchased by the third Earl of Shaftesbury, author of "Characteristics," in 1699 from the Bovey family, heirs of the widow of Sir James Smith, who, it is believed, built it in 1635. Brompton Cemetery, which formerly belonged to the West London and Westminster Cemetery Company, incorporated on June 12, 1840, was laid out between Honey-lane (Ifield-road) and the Kensington Canal. The chapel and catacombs were designed by Benjamin Baud.

Notabilia.—West Brompton: The Church of the Sacred Hearts of Jesus and Mary, with the lady-altar, and the monastery for the Servite Fathers of St. Mary's Priory in Fulham-road—J. A. Hansom (*ob.* April 29, 1882) and his son, Mr. J. S. Hansom [April 21, 1883]. Walton-street police station, 1894—Mr. R. Norman Shaw. Adrian-terrace and Ifield-road, on site of Honey-lane; Redcliffe-gardens, on site of Walnut Tree-walk; Thistle-grove, on site of Brompton Heath. Buildings, south side of Park-walk, between Chapel-street and Winterton-place, 1898—J. T. Wimperis & Arber; block of flats, Park-walk—Mr. C. W. Stephens. St. Mark's College Chapel, windows in nave—Wailes. The Oratory; white marble statue of Cardinal Newman, unveiled July 15, 1896, modelled by M. Chavalliaud, the memorial designed by Messrs. Bodley & Garner, executed by Messrs. Farmer & Brindley. The Grange (near Alexander-square), pulled down in 1842—built for himself by Michael Novosielski, who built also Michael's-place, 1786, pulled down in 1886 and partly rebuilt. Michael's-grove, renamed Egerton-place; Brompton-crescent, renamed Egerton-crescent. London and Joint Stock Bank, Onslow-square—Mr. R. Creese Harrison. Basil-street (west side), at the corner of New-street, shops and flats, 1898—Mr. C. W. Stephens. Drayton-gardens, block of flats on site of No. 59—Mr. J. Norton. The Admiral Keppel, next, south, to which was Chelsea Pound, rebuilt 1856-7.

THE BRITISH SCHOOL AT ATHENS.

The Annual Meeting of the British School at Athens, held at the Society of Antiquaries' room on the 24th ult., was well attended. Sir Richard Jebb occupied the chair; and Mr. Mayor, the acting Hon. Secretary, read the annual Report, from which we extract the following passages:—

"The work of the School, both on its teaching and on its exploring sides, has been energetically carried on during the past session under the newly-appointed director, Mr. Carr Bosanquet. The number of students in residence was five, as compared with six in the previous session. One of these, Mr. J. H. Marshall, scholar of King's College, Cambridge, had been already admitted for the session 1898-99, and came out now with the Prendergast Travelling Studentship; and a second, Mr. J. H. Hopkinson, scholar of University College, Oxford, had been already admitted for the session 1899-1900, and came out again for a second session as Craven Fellow of the University of Oxford. The three newly-admitted students were Mr. K. T. Frost, of Brasenose College, Oxford, who held the studentship offered by the Managing Committee to the University of Oxford; Mr. R. D. Wells, of Trinity College, Cambridge, who was appointed by the Committee to the Architectural Studentship on the recommendation of the President of the Royal Institute of British Architects; and Mr. J. H. Baker-Penoyre, of Keble College, Oxford. . . . .

The new director, Mr. Bosanquet, reached Athens at the end of October and returned to England at the end of August, thus residing altogether ten months in Greece, of which about six months were spent at Athens and about four in Crete. Mr. Bosanquet has marked the beginning of his term of office by submitting to the Committee some valuable suggestions for the guidance of students at the School, which will, it is hoped, help to increase its usefulness as a teaching institution. These suggestions were printed in the last number of the 'Annual,' and are at the disposal of intending students on application to the Secretary.

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Excavations were undertaken this year by the School at Praesos, situated on the central plateau of Crete, and at Petras on the coast a few miles to the north. The work was conducted by the director with the assistance of Mr. Marshall and Mr. Wells. Praesos was in historic times the chief centre of the Eteocretans, who represented the most primitive element in the population of ancient Crete, and it was therefore hoped that the excavations here might bring to light traces of civilisation of the Mycenaean epoch, together with inscriptions in the non-Hellenic and presumably Eteocretan language, of which one specimen had previously been found in this neighbourhood. The first hope was not fulfilled, for on the site of Praesos itself only one product of Mycenaean art was discovered, a gem found embedded in the mortar of a late Greek house, into which it must have been accidentally brought with the earth from some neighbouring tomb when the house was built. About a mile away, however, a large house of late Mycenaean work was discovered in a valley near a spring, and somewhat nearer the city were found two tombs of the same period, one a square chamber with a dromos, and the other a well-built beehive tomb. In the same neighbourhood a number of later tombs were opened, ranging from the Geometric period to the fourth century and containing a large quantity of vases of various periods.

Praesos itself appears from the remains discovered to have been an important place from the eighth or seventh century downwards. The most interesting objects were brought to light in a *temenos* on the top of a crag near the town. Here Mr. Bosanquet was fortunate enough to discover an inscription seventeen lines long in the non-Hellenic language referred to above and written in Greek characters of the fifth century B.C. In the same place were found a series of votive offerings in bronze and terra-cotta. The terra-cottas, which range from the sixth to the fourth century, reveal the existence of a vigorous native school of art, and include the upper part of a fine archaic statue of a young god, half life size, and a well-preserved head with fragments of the body of a couchant lion. The remains of three other sanctuaries were also investigated. On a saddle below the Acropolis was discovered a large and solidly-constructed building of late Greek workmanship, with a front 75 ft. long, which may, it is suggested, have been an 'Andreion' of the kind in which the Cretan citizens met for common meals.

The excavations at Petras on the sea coast brought to light considerable quantities of pottery of the Mycenaean period. The site appears, however, to have been systematically turned over and terraced by its owners a few years ago, and it was therefore not thought worth while to undertake here work on a large scale. Accounts of the discoveries at Praesos and Petras will be published in the forthcoming number of the 'Annual.'

Supporters of the British School will be interested to hear of the work that has been done in the other parts of Crete during the past season by the Cretan Exploration Fund. At Knossos Mr Arthur Evans, an associate of the School, assisted by two former students, Dr. Mackenzie and Mr. Fyfe, has continued the excavation of the great prehistoric palace which has been associated with the legends of Minos and the Labyrinth. The whole northern end of the palace and an extensive eastern quarter have been uncovered during the past year. Shortly before the close of the season a triple flight of stone stairs was brought to light, leading down from an upper corridor to a suite of halls, showing remains of colonnades and galleries. As it appears that the principal staterooms were situated on this lower level, it is possible that the results of next season's work may surpass in interest even those which have already been obtained. Mr. Hogarth, the late director, has also been enabled by a grant from the Cretan Exploration Fund to explore an ancient site at Zakro, in the extreme east of the island. He has there laid bare a small Mycenaean town with well-preserved remains of the lower part of the houses and magazines, and has discovered some fine examples of early pottery and an interesting deposit of clay impressions of Mycenaean gems and signets, including 150 different types. Mr. Hogarth was assisted by Mr. Wells in mapping, and by Mr. Marshall in classifying pottery. Through the kindness of Mr. Evans and Mr. Hogarth accounts of these various discoveries will appear in the next number of the School 'Annual.' . . .

Three open meetings of the School were held in Athens during the past session, and were well attended. The Committee are glad to record, as a sign of the friendly relations existing between the School and its neighbours, that at one of these meetings a paper was read by Dr. Wilhelm, Secretary of the Austrian Institute at Athens, on an inscription formerly in Mr. Finlay's house and now in the collection of the British School; while at another meeting a paper was read by a Greek scholar, M. Clon Stephanos, director of the Anthropological Museum in the Academy at Athens, on the ethnology of prehistoric Greece. . . .

The repairs to the School building, which were stated in last year's Report to be urgent, were successfully carried out during the autumn of 1900 under the direction of Mr. Fyfe, who held the Architectural Studentship last year. The principal matter requiring attention was the reconstruction of the roof, but the opportunity has been taken to carry out a number of minor improvements and repairs which have added greatly to the appearance as well as to the comfort and convenience of the School building. The precinct in which the School and hostel stand has also been much improved during the past year, by means of private subscriptions generously contributed by the director and a few other friends of the School. A new carriage road has been constructed giving access to the School from the street on the south; several hundred trees have been planted; and a terraced walk has been made along the upper northern end of the School grounds. It is proposed next year to complete the work by laying out the ground on the south-east side of the hostel.

The Committee point out with satisfaction that the cost of the very considerable repairs to the School, amounting to over 450*l.*, has been defrayed out of the revenue of the last two years, without any inroad upon the small invested capital of the School. This result has been obtained mainly by the special grants for the Praesos excavations made by the Society of Dilettanti (50*l.*) and the Cretan Exploration Fund (200*l.*), together with one of 40*l.* from the Cambridge Prendergast Fund made to the director for the same purpose. . . . .

The monograph on St. Luke's Monastery at Stiris, on which Messrs. Schultz and Barnsley have so long been engaged, has now been published, and has been generally recognised as a most valuable contribution to the study of Byzantine architecture. Friends of the School are reminded that Mr. Schultz still has a good deal of material in his hands if funds could be provided for publication, while the Committee would gladly set other students to work in this important field if they were in a position to do so. Subscriptions to the Byzantine Architecture Fund for this purpose would be gladly received by the treasurer. There are still some copies on hand of the monograph on St. Luke's, which can be obtained on application to the publishers, Messrs. Macmillan & Co., or from any bookseller.

Considerable progress has been made with the scheme for establishing a British School at Rome, to which reference was made in the last Report. . . . The work of the school has already begun. The director has written a full report on the recent excavations, which appeared in the *Times* of January 9, and has delivered a lecture, which will shortly be published, on the ancient Church of Santa Maria Antiqua. A monograph on the Roman Roads in the Campagna, by Mr. T. Ashby, late Craven Fellow in the University of Oxford, and now a student at the school, is also nearly ready for publication. Additional funds are, however, urgently needed, if the work of the school is to be properly developed. It should be remembered that the work of the school will not be confined to classical archæology. It is intended to be a centre for all British students in Rome; and the provisional scheme, approved by the General Committee, provides that every period of the language and literature, antiquities, art, and history of Rome and Italy shall be considered as falling within its province.

In conclusion, the Committee think that they are entitled to say that the British School at Athens is every year fulfilling more successfully the objects for which it was founded. In the work of excavation it has, even with the scanty means which were at first at its disposal, done much—as much, it may confidently be said, in proportion to its funds, as has been done by any of the other schools in Athens; and, in view of the somewhat greater financial stability which it is now beginning to enjoy and the opportunities available for work both in Crete and elsewhere, it may be hoped that results as interesting as any of those secured in the past will be forthcoming in the next few years. On the side of education, too, the school has done most valuable service in providing a centre for classical students who wish to supplement their work at the Universities by one or two years' work in Greece, while it has also been of great assistance to British travellers in Greece generally. There is, however, one thing which the school still urgently needs, namely, some provision for advanced students of archæology, by which their services might be secured to the school for a series of years. In this respect the British school is at present weaker than any of the foreign schools in Athens, all of which include on their staff either an assistant director or one or more such advanced students."

Sir R. Jebb, in moving the adoption of the Report, described the British School at Athens as being intended to furnish a permanent station from which explorations could be conducted, and also a kind of archæological consulate for visitors to Greece. Referring to the archæological work of the year, he mentioned especially Professor Furtwängler's discovery that the temple in Ægina was dedicated to a local goddess named Aphaia, soon after 490 B.C., on the site of a sixth-century Doric temple. He thought they wanted something in the nature of an archæological fellowship in connexion with the School, tenable for a term of years, as an object to which a student might look forward, and as helping to make a career for a man who had a special ability in archæological investigation. This would render the institution more of the nature of an archæological college; a character which the French School at Athens did to some extent possess.

Mr. Bosanquet made a statement as to the work of the school during the season, and announced that Mr. Marshall had been selected by the Government of India as Director-General of the Archæological Survey of India.

On the motion of Mr. Penrose, seconded by Mr. F. E. Thompson, the following list of officers were elected for the ensuing year:—Committee: Professors Ernest Gardner, Percy Gardner, and Pelham, and Dr. Waldstein (re-elected); hon. treasurer: Mr. Walter Leaf (re-elected); hon. secretary: Mr. W. Loring; Lord Lingen and Mr. F. Pollock as auditors (re-elected), and Mr. Edwin Waterhouse as an additional auditor.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The annual general meeting of this Institution was held at the Westminster Palace Hotel on October 25, the Chairman, Mr. Percival Marshall, presiding. After the usual preliminary business had been disposed of, the Council's Report on the work of the past year and accounts relating to that period were presented and adopted. The Report stated that there had been 103 elections, bringing up the total membership to 652. The names of Professor G. F. FitzGerald, F.R.S., hon. member, of Dublin, Mr. Louis F. Awde, of London, and Mr. E. H. S. Cooper, of Rugby, members, had been removed by death. In addition to the seven monthly meetings, a meeting had been held under the title of "Engineering Question Night," when a number of different engineering questions were dealt with, this new feature in the programme proving very successful. The Institution premium had been awarded to Mr. Samuel Cutler, jun., for his paper on "Carburetted Water-Gas." The Council had accepted the offer of the sum of five guineas made by Mr. W. H. Northcott, hon. member, to be competed for by the members in the preparation of a paper on "The Mutual Relations of Employers and Employed," and the three adjudicators, consisting of Mr. Northcott himself, Mr. J. A. F. Aspinall, and Mr. Archibald Denny, had awarded the prize to Mr. William Powrie. Reference was made to the opening last June of the Institution offices at 39, Victoria-street, the rooms having been suitably furnished as library, reading and writing rooms, &c. There had been eleven visits to engineering works in London and the vicinity, and during the summer meeting at Plymouth the Government establishments at Devonport and a number of engineering and other works had been inspected. Acknowledgments of the courtesy met with on all these occasions were recorded in the Report. Reference was also made to the Engineering Congress at Glasgow, which the Institution had been invited to take part in, a number of the members being present. To the provincial technical societies an invitation had been addressed enabling any of the members who might be temporarily resident in London to attend the meetings of the Institution. The Council were co-operating with the German Society of Engineers in the compilation of a German-English-French technical dictionary. It was announced that the premier position in the Whitworth Scholarship Examinations for 1901 had been obtained by a member of the Institution, Mr. C. E. Hardy, of Plymouth. Allusion having been made to the appointment register, the utility of which was being much improved; to the library, which, now that the Institution had offices, would be considerably developed; and to the accounts, which showed that the finances were in a satisfactory condition, the Report concluded with some observations as to future arrangements, including the delivery of a Presidential Address by Sir John Jackson, F.R.S.E., to inaugurate the new session. The election of officers was announced as follows:—Chairman, Mr. P. Marshall; Vice-Chairman, Mr. Kenneth Gray; Hon. Librarian, Mr. L. H. Rugg; Members of Council, Messrs. S. Cutler, jun., Adam Hunter, C. J. McNaught, and H. C. Reid, in addition to those remaining in office; Secretary, Mr. W. T. Dunn.

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THE LONDON BUILDING ACT, 1894:

THE TRIBUNAL OF APPEAL AND THE BUILDING LINE.

THE Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institute, Westminster, on the 25th ult., to hear an appeal by Mr. C. W. Matthews against the certificate of the Superintending Architect of Metropolitan Buildings under Sections 22 and 29 of the Act, defining the general line of buildings on the western side of West Hill, Highgate, between Millfield-lane and Parliament Hill Fields in which he certifies the building in question to be situate. The members of the Tribunal sitting were Messrs. J. W. Penfold (chairman), A. H. Hudson, and A. Gruning.

Mr. Macaskie, barrister, appeared for the appellant, and Mr. Andrews, from the Solicitor's department of the London County Council, represented the superintending architect.

The appellant is the owner of the houses and premises, 1 to 5 (odd), West Hill, and of 1 to 4, Brookfield, and the two-story house lying between 4 and 5, West Hill. The houses on West Hill and Brookfield have been erected within the last three years without any objection on the part of the County Council or any other authority. On October 16, 1900, a plan of buildings in four blocks—namely A to F—proposed to be erected by the appellant at West Hill, was submitted to the District Surveyor, and notice was at the same time given to him of the appellant's intention to commence building blocks A and B at once. The plan showed blocks A and B to be within the general line of building as defined by the superintending architect. This notice was forwarded by the District Surveyor the same day to the County Council, with a letter stating that he presumed that no question could be raised as to the general building line owing to the position of the existing buildings. Objection was taken to the proposal to lay out a new street as shown in the plan to connect blocks C, D, E, and F. No objection at all was raised as to the building line, nor as to erection of blocks A and B. On April 2 the appellant saw the Solicitor of the London County Council with reference to the proposed scheme for laying out a new street, but no question was raised as to the building line, and appellant, at his request, sent him a tracing of the proposed scheme, which was again placed before the Building Act Committee, and still no objection was taken to the building line.

The appellant, believing he was well within the building line, knowing that no objection had been taken as to the building line, but to the formation of the street only, and believing that no objection as to the building line would or could be taken, did, shortly after the date of giving notice of his intention so to do, begin building operations in respect of block A according to plans deposited on October 6 last, and had spent upward of 3,000*l.* to the date when he received the first intimation that it would be objected that block A was within the general building line. The appeal was, therefore, lodged on these grounds:—First, that the superintending architect was wrong in defining the general building line as he did; secondly, that he was wrong in defining the general line for so much of the street as he did, it being contended that he should not have defined it so as to include or have regard to the buildings between block A and Millfield-lane, but that he should have defined it so as to include and have regard only to the buildings 1 to 4, West Hill, 1 to 4, Brookfield, the buildings marked X, and the sites and blocks A and B. Thirdly, it was urged that alternatively the superintending architect was wrong in not including or having regard to the houses on West Hill, lying to the north of Millfield-lane; and, fourthly, it was submitted that the application to the superintending architect to define the general line of buildings was made too late, having regard to the fact that the delay of the London County Council had led the appellant to expend large sums of money in the belief that the line was fixed as the appellant contended it to be.

Mr. Macaskie submitted that the superintending architect had put the general building line too far back. He proceeded to narrate the history of the case in so far as it related to the erection of the buildings already in existence.

Mr. Andrews, however, objected to the appellant going behind the superintending architect's certificate.

Mr. Macaskie insisted that the County Council, by their conduct, had objected too late.

Mr. Andrews urged that it was not too late for the superintending architect to be called in to give a certificate at that point. It had been clearly laid down that a certificate might be made after a building was up. He believed the appellant had been invited to make an application to the Council for permission to build in advance of the line. On the other hand, he contended that he was not bound to make such an application. If that was his (appellant's) view the Council could not help themselves.

Mr. Macaskie said he was instructed that no invitation was sent to the appellant. But even if it had been, that was no security that the owner would be allowed to build in advance.

Mr. Andrews again submitted that the point now before the Tribunal was whether the superintending architect's certificate was right. He cited the case of Spackman *v.* Plumstead Board of Works.

The Tribunal, having deliberated in private, declined to hear evidence on behalf of the appellant relating to the fourth ground of appeal, stating that the Tribunal could only deal with the appeal against the decision of the superintending architect's certificate.

Mr. Macaskie thereupon complained that the certificate was an extraordinary one, inasmuch as the superintending architect had drawn the building line more than 50 ft. from the highway, and behind existing buildings, which were set up without objection.

Mr. Andrews contended that the general building line as laid down was strictly in accordance with the Act and precedent, and after hearing evidence the Tribunal intimated that they would consider their judgment and communicate it to the parties in due course.

APPLICATIONS UNDER THE LONDON BUILDING ACT.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated consent was given on conditions. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Strand.—Iron and glass shelter in Windmill-street, at the London Pavilion Music-hall, Piccadilly Circus (Messrs. Wylson & Long).

Hampstead.—Dwelling-house with two wood and brick porches, a verandah with wooden supports, and a projecting bay-window, on the east side of Finchley-road, Hampstead, at the corner of Platt's-lane (Messrs. Kidner & Berry).

Hampstead.—Wooden porch at the entrance to 78, Fitzjohn's-avenue, Hampstead (Messrs. Maple & Co.).

Lewisham.—Extension of the period within which the erection of houses with shops on the north side of Sydenham-road, Sydenham, between Silverdale-buildings and Mayow-road, was required to be completed (Messrs. I. Edmondson & Son).

Islington, North.—Iron and glass shelters at the Holloway Empire Palace, next Holloway-road and Manor-gardens, Islington (Mr. F. Matcham).—Consent refused.

Hackney, North.—Two-story building at the rear of No. 87, Reighton-road, Upper Clapton (Mr. H. Dyball).—Consent refused.

Strand.—The retention of a metal sign in front of the Windsor public-house, 427, Strand (Electrical and General Engineering Co.).—Consent refused.

Width of Way and Lines of Frontage.

Hackney, Central.—Iron and glass shelters at the Hackney Empire Palace, Mare-street, Hackney, in front of the portions of the building next The Grove (Mr. F. Matcham).

Space at Rear.

Hampstead.—Modification of the provisions of that Section with regard to open spaces about buildings, so far as relates to the proposed erection of two blocks of residential flats on a site on the west side of West End-lane, Hampstead, between Douglas Mansions and Carlton Mansions, with irregular open spaces at the rear (Messrs. Palgrave & Co.).—Consent refused.

Means of Escape from the Top of High Buildings.

Westminster.—On the fifth and sixth floors of a block of residential flats to be known as Stafford Mansions, and to be erected on the west side of Stafford-place, near its junction with Palace-street, Westminster, the upper surfaces of which floors will be above 60 ft. from the street level, for the persons dwelling or employed therein.

Formation of Street.

Greenwich.†—Formation or laying out of a new street for carriage traffic to lead out of Cedargrove, Charlton (Mr. J. Ellis).—Consent refused.

Alteration of Building.

Hampstead.—The retention of a bedroom and boxroom constructed in the roof of No. 48, Belsize-park, Hampstead, of a less height than required by Section 70 of the Act, and by reason of the construction of which bedroom and boxroom the walls of the building are of less thickness than required by the first schedule of such Act (Mr. J. W. Stevens).—Consent refused.

The recommendation marked † is contrary to the views of the Local Authority.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this body was held at Spring-gardens on Tuesday, Mr. A. M. Torrance presiding.

Loans.—The following loans to public bodies were granted:—3,000*l.* to Bermondsey Borough Council for paving works; 6,700*l.* to Finsbury Borough Council for paving and sewer works; 2,545*l.* to Shoreditch Borough Council for paving works; 1,940*l.* to Woolwich Borough Council for various purposes; 2,909*l.* to Kensington Borough Council for paving works; 2,190*l.* to Poplar Borough Council for baths and washhouses; 22,365*l.* to Guardians of Stepney Union for erection of schools, &c.; and 5,970*l.* to Wandsworth Guardians for various purposes.

Chief Engineer.—The General Purposes Committee submitted a recommendation that the appointment of Sir Alexander Binnie be terminated from December 31, and that Mr. Maurice Fitzmaurice be appointed as from and including January 1, 1902, at a salary of 2,000*l.* a year. The Committee stated that the applications were thirty in number, and the sub-committee to whom they had referred the matter had had a personal interview with seven of the candidates. The sub-committee submitted three names to the Committee—Mr. Charles Elwin, general and Parliamentary assistant in the Engineer's Department of the Council; Mr. Maurice Fitzmaurice, chief engineer of the Assouan Nile reservoir (Egypt), and formerly resident engineer for the Council on the Blackwall Tunnel; and Mr. E. G. Mawbey, Engineer and Surveyor of the County of Leicester.

The recommendation of the Committee in favour of the appointment of Mr. Fitzmaurice was adopted.

The Southwark Clearance Scheme.—The Improvements Committee reported that in connexion with the Long-lane and Tabard-street improvement the Council had acquired from the Bridge House Estate Trustees a site in Leroy-street, Old Kent-road, and had prepared a draft scheme for the erection of dwellings for the accommodation of persons to be displaced by the improvement. They recommended that in the event hereafter of the Council approving the scheme that the expenditure of 1,443*l.* be charged to the account. This was adopted.

SCHOOL BUILDINGS, WOLVERHAMPTON.—These premises, which were recently opened, have been erected in Old Hall-street on a site containing 900 square yards. The accommodation, which occupies the whole of the ground floor, consists of a central hall, 28 ft. by 22 ft., with two classrooms, 22 ft. by 20 ft., to hold twenty in each room. Separate entrances are provided for boys and girls on either side of the building, with separate yards and out-offices, also separate hat and cloakrooms, lavatories, and bathrooms. A kitchen, scullery, and pantry are provided, also private room for head mistress. The several rooms are all fitted with open fireplaces in addition to hot-water apparatus. The first floor is to be used as a school for practical science, in connexion with the pupil teachers' centre on the opposite side of the street. The accommodation consists of a chemical laboratory 40 ft. by 22 ft. to accommodate thirty students, also a lecture theatre 23 ft. by 22 ft. Lavatories for boys and girls are provided on the mezzanine floors. The hot-water apparatus was supplied and fixed by Messrs. Killick Cochrane, of Liverpool. The electic lighting has been fixed by the District Electric Lighting Co. The fittings and furniture have been supplied by Messrs. Fisher, Son, & Weaver, of West Bromwich, and Messrs. Speake & Son are the general contractors for the work. The total cost of the buildings and fittings has been about 4,000*l.* The whole was carried out from the designs of Mr. T H. Fleeming, architect, of Wolverhampton.

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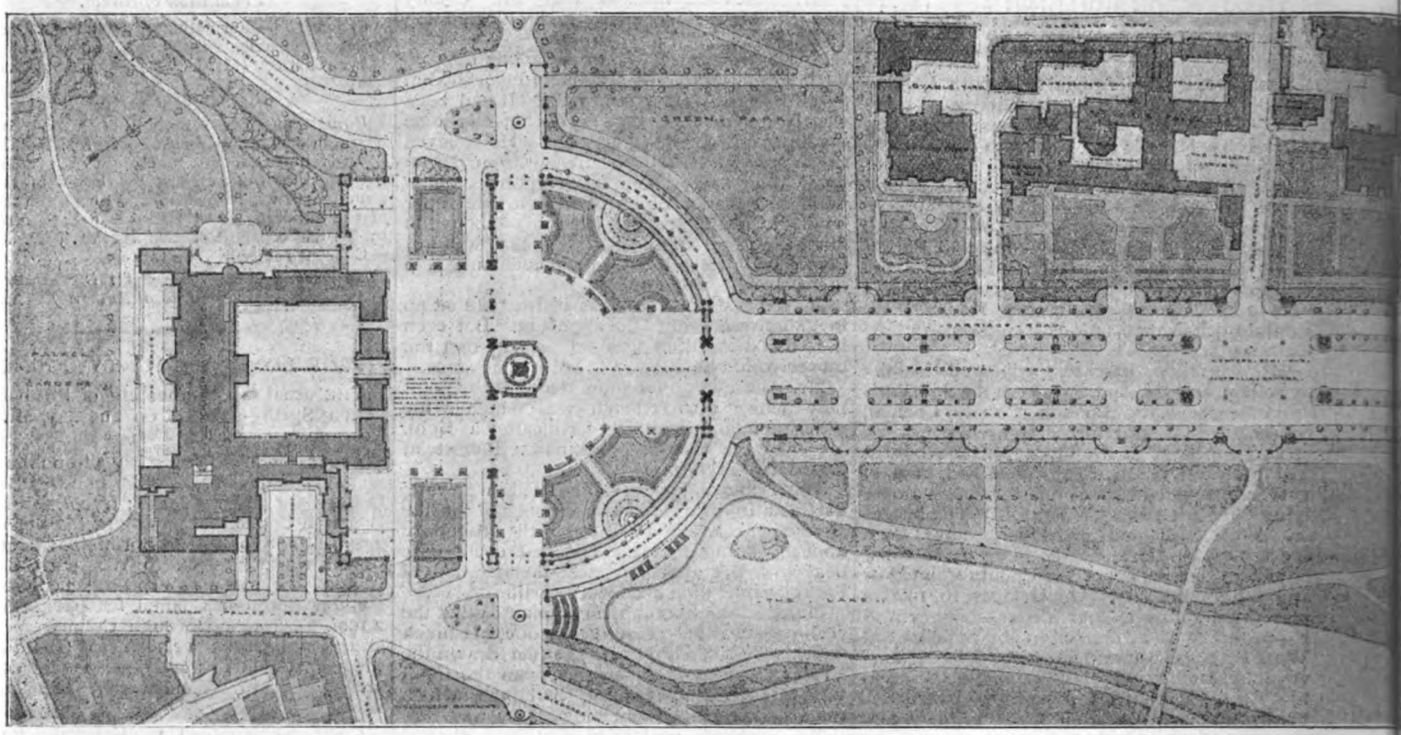

The Queen Victoria Memorial: Plan of the

Illustrations.

THE QUEEN VICTORIA MEMORIAL: SELECTED DESIGN.

We give here the plan and two views of Mr. Aston Webb's design for the Queen Victoria Memorial, which has already been the subject of a descriptive article in our columns when it was first exhibited at the Foreign Office, and of which some further description, in regard to some modifications now made in it, will be found in the first article in the present issue.

The plan shows the ingenious connexion with Charing Cross by means of a circle, to which we have elsewhere referred. The actual entrance from Charing Cross will be by a decorated gateway without an arch.

The points opposite to the Duke of York steps and Marlborough Gate are emphasised, as will be observed, by the formation of an octagonal *place* at each point, with pedestals arranged for special sculpture subjects.

ILLUSTRATIONS OF OLD CHELSEA AND MILLBANK.

These illustrations, from some old maps and sketches in the Print-room of the British Museum, are published in connexion with the article on Old Chelsea on another page, and some of them are specially referred to there.

The bird's-eye view of Beaufort House does not directly come into the scope of the article referred to, but is of much interest in itself. The original "View of the House at Chelsey" is a fine print, on a large scale, engraved by Kip, after a drawing by Knyff, 1707. The house, which stood until 1740 where is now Beaufort-street, was, as some say, originally the "Great More House"—"my powre howse in Chelcith," of Sir Thomas More. Having been granted by Edward VI. to his Lord Treasurer, Sir William Paulet, first Marquis of Winchester, it passed by purchase to Gregory, Lord Dacre, whose widow devised it to Lord Burghley, whose son, the Earl of Salisbury, sold it to Henry Earl of Lincoln. In 1625 Charles I. bought the house, with its fifteen acres, from Sir Lionel Cranfield (Lord-Treasurer Middlesex) and gave it to the Duke of Buckingham. Whitelocke resided there during the time of the Commonwealth; the second Duke of Buckingham recovered possession at the Restoration and sold it in 1664 to John Godden. Then it belonged to George Digby, Earl of Bristol, who died there in 1677 leaving it to his widow, Anne, on whose behalf Evelyn effected its sale to Henry, first Duke of Beaufort. The Duke of Beaufort removed thither in 1682 from his town house in the Strand (see our "Note" of October 26), and, as Evelyn also records, "made great alterations, but might have built a better house with the materials and cost he had been at." Henry, the third Duke, sold it, about 1738, for 2,500*l.*, to Sir Hans Sloane, who, four years afterwards, pulled the house down. Sloane, however, gave the gateway which Inigo Jones had built for Lord Middlesex to Lord Burlington, who set it up in his garden at Chiswick. Knyff's drawing shows the old houses in Duke and Lombard streets, by the waterside, to which we refer in our article, and Lindsay House, the iron gate of which we illustrated on November 28, 1891.

Correspondence.

To the Editor of THE BUILDER.

SHOREDITCH TOWN HALL.

SIR,—Referring to your criticism of my arrangement of the cloakrooms and lavatories in this building in your issue of the 19th inst., it was not my intention to reply to same, as I considered the plan spoke for itself; but, as the chief officials at Shoreditch have signified their wish that I should do so, I venture to point out to you one or two facts which you have evidently overlooked or were unaware of. In the first place, both the ladies' and gentlemen's cloakrooms and lavatories are in the old building, and do not therefore form part of my new extension; they are old rooms altered and adapted as required.

There is a vestibule about 24 ft. wide, with a separate staircase up to large hall on each side. At the foot of each staircase is a door, that on left to ladies' cloakroom (from which their lavatory and crush cloakroom are approached), and that on right to gentlemen's cloakroom (from which their lavatory is approached). The other doors to the ladies' crush cloakroom and the gentlemen's lavatory are arranged so that these particular rooms may also serve other purposes—an arrangement adopted in most London town-halls.

The ladies' crush cloakroom will only be required to be used *as such* on very exceptional occasions; possibly twice or three times during the year, when the door you object to (which is an *existing* one) would be fastened. At other times this room will be used as an extra clerk's office by the Town Clerk (as might have been conjectured by the door leading from that official's department), when the door from vestibule will also be used. The door from vestibule will probably be used in the day-time only, when the cloakroom doors will be closed. In the evening, when the large hall is being used, the before-mentioned door would be closed, and the lavatory approached from cloakroom only.

I am sure you will admit after this explanation that your very severe remarks were at least unjustified, and I should have thought that any expert would have seen and fully appreciated such an elementary but important point in a plan as the existence of alternative doors and the occasions on which the same would be in use or fastened. This would have at once disposed of your objections.

As your condemnation was so strong, I trust you will, in fairness to my clients and myself, find space for this letter in your next issue.

WILLIAM G. HUNT.

*** It is rather absurd for our correspondent to say that "the plan spoke for itself," as there was nothing in it to show which were old rooms and which were new, and no explanation as to the use made of the door of the ladies' crush cloakroom. On the face of it, and without explanation, the plan fully justified our observations; and we cannot but think that if the architect had been more fully alive to the importance of this point in planning he would not have allowed such a plan to be published without an explanation. The position of the cloak-room entrances is still, we think, open to criticism. The doors are too close to the foot of the stairs, and the plan represents the mistaken principle, which we have often protested against, that the entrances to ladies' and gentlemen's cloakrooms should be planned *symmetrically*, one answering to and facing the other. That is exactly what should not be done.—ED.

RE AMERICAN RED GUM.

SIR,—As use has been made of the name of one of our Committee, viz, Sir J. F. L. Rolleston, M.P., we wrote him on the subject, and he replies as follows:—

"In reply to your letter, the impression you received as to the effect of our Report is altogether a mistaken one, as we expressed no opinion whatever as to the Red Gum Wood, and were not asked to do so."

J. MACCONNELL,
Hon. Sec. The Westminster Rate-payers' Committee.

DEAL FLOORING.

SIR,—Will one of your readers kindly tell of a treatment of flooring of deal boards which will render it impervious to dirt, of a good colour, and readily cleaned? D. J.

NEW CHURCH, AWSWORTH, NOTTS.—On the 19th ult. the foundation-stone of the new parish church which is being erected at Awsworth was laid. The edifice will be of red sand bricks, with facings of Coxbench stone, and a roof of blue slates. The portion of the old church which has been left standing will be utilised as a temporary chancel, and the internal fittings of the new portion will be of pine. The cost is estimated at 2,000*l.* The architects for the work are Messrs. Naylor & Sale, of Iron-gate, Derby, and the contractors are Messrs. Walker & Slater, of Derby.

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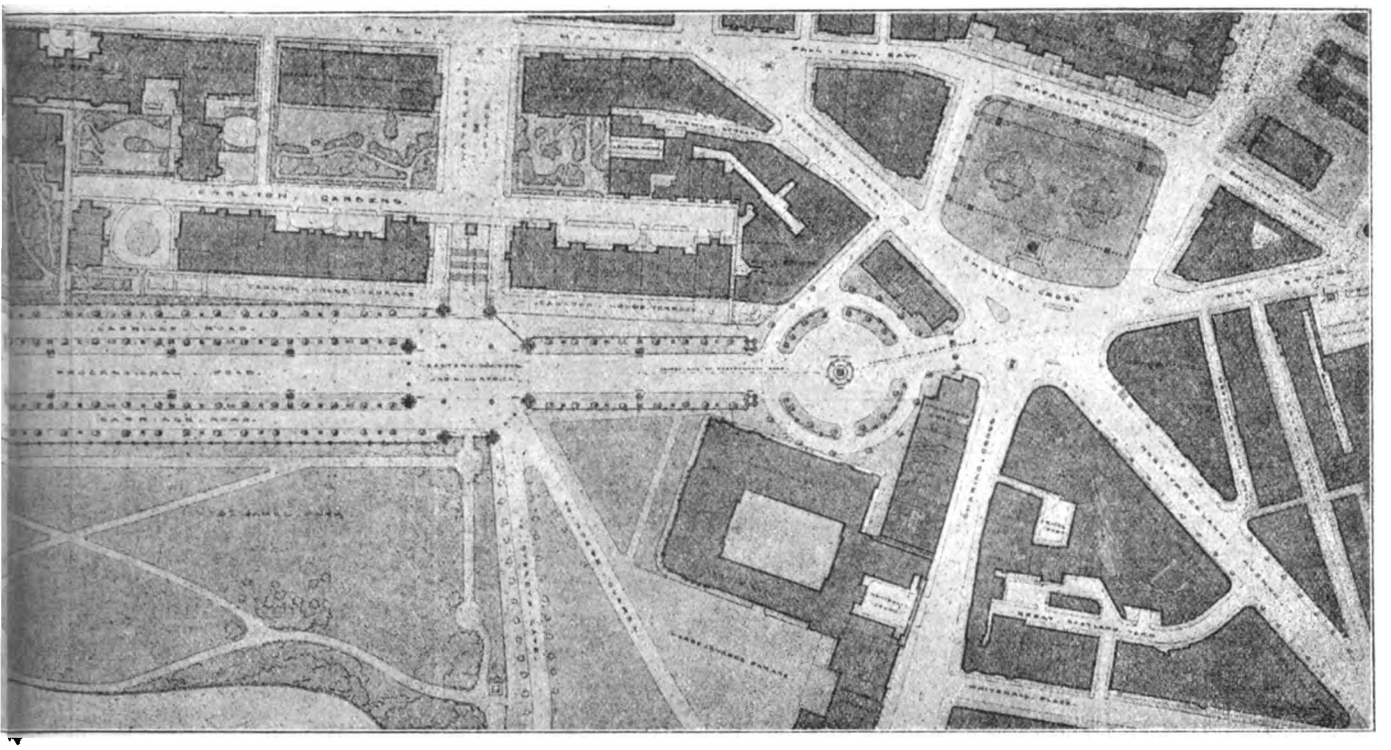

Design. *Mr. Aston Webb, A.R.A., Architect.*

The Student's Column.

GAS AND GAS FITTINGS.

18.—Gas Leakages—Explosive Mixtures of Gas and Air — Detection of Small Proportions of Inflammable Gas or Vapour in Air—Determination of the Heating Power of Gas.

WHEN a strong odour of gas is perceptible in the atmosphere of a room or building, all lights should be immediately extinguished, all windows should be opened, and unless the leakage of gas is occurring at some point where the cause of leakage is obvious, and where it can readily be stopped, as, for example, when a cock has been accidentally turned on, the gas should then be turned off at the meter.

After shutting off the gas at the meter, and when the odour of gas is no longer perceptible, an inspection should be made of all the pipes and cocks in the neighbourhood of the leakage, and if no defect can be detected the consumer should then seek the aid of the officers of the gas company, or send for an experienced gas-fitter.

Cheap brass pendants constructed of thin brazed tube, instead of thick drawn brass tube, should be avoided. They have a dangerous habit of splitting longitudinally. A long but hardly perceptible crack suddenly occurs in the tube and allows the gas to escape in large volume. Also the cheap ball-and-socket connexions are frequently defective and allow gas to escape, particularly when the pendant becomes slightly tilted from the vertical position.

Explosions have sometimes been caused by the accumulation of gas in the space enclosed between the floorboards of a room and the ceiling of the room beneath. Gas confined in this space often fails to be detected until it is present in sufficient volume to form an explosive mixture, especially when the greater part of the floor is covered with carpet or linoleum; and when a naked light is taken near a crack between the boards, or a board is removed for examination of the pipes and a match is ignited to illuminate the space, a disastrous explosion occurs.

To ascertain whether any leakage is occurring in any part of a building, all the cocks to the burners should be closed, while the meter tap is left full on. Most meters have a dial situated above the ordinary recording indices which has a pointer which will make a complete revolution for every 2, 5, or 10 cubic feet (varying with the size of the meter) which pass through the meter. If a record be made of the position of this pointer when all the burner cocks are closed, and if, during a period of fifteen minutes, it be found that the pointer remains quite stationary, the consumer may be satisfied that the fittings are gas-tight.

Explosions have occurred through two or more small gas jets being left burning in a room exposed to draught from a window. One of the jets has been extinguished by the draught, and sufficient gas has accumulated in the room, in spite of the open window, to form an explosive mixture, which has then been ignited by the jet not extinguished by the draught.

Leakages have occasionally occurred from sliding pendants provided with water seals, owing to neglect of the precaution to periodically add water to compensate for that lost by evaporation. This danger may be avoided by using glycerine, instead of water, in the water reservoir, as glycerine does not evaporate, and will, therefore, act as a permanent seal. If the use of glycerine be considered too costly, the rate of evaporation may be retarded by pouring a layer of lubricating or other suitable oil on the surface of the water until the layer is about ½ in. in depth.

Explosive Mixtures of Gas and Air.—The most important experiments which have been made to ascertain the proportions of air required to form explosive mixtures with different gases are those carried out by Dr. Frank Clowes, the present chemist to the London County Council, in 1895 and 1896. Some of the results of his investigation are shown in the following table, and it will be noticed that the explosive limits vary widely with different gases, the danger of the formation of an explosive mixture being, for example, greater with acetylene than with coal-gas :—

Explosive Limits of Mixtures of Gas and Air.

A mixture of—

Coal gas and air will not explode if it contain less than 5 per cent. or more than per cent. of coal gas.

Water gas and air will not explode if it contain less than 5 per cent. or more than 55 per cent. of water gas.

Hydrogen and air will not explode if it contain less than 5 per cent. or more than 72 per cent. of hydrogen.

Carbon monoxide and air will not explode if it contain less than 13 per cent. or more than 75 per cent. of carbon monoxide.

Acetylene and air will not explode if it contain less than 3 per cent. or more than 82 per cent. of acetylene.

Methane (fire-damp) and air will not explode if it contain less than 5 per cent. or more than 13 per cent. of methane.

Detection and Estimation of Small Quantities of Inflammable Gas or Vapour in Air.—Coal-gas cannot always be detected by its odour. By passing through a bed of gravel or other soil it may be deprived of its characteristic odour, and may accumulate in its odourless condition in an enclosed space in sufficient quantity to form an explosive mixture. It has been suggested that the mysterious explosions which have upon several occasions occurred in culverts containing electric lighting cables may have been due to leakages from neighbouring gas mains, the gas being deprived of its odour before reaching the culverts by passage through the interposing soil.

It has long been known to miners that when the atmosphere in a mine contains inflammable gas, but in too small a quantity to form an inflammable lor explosive mixture, and a lighted candle is exposed in this atmosphere, a pale flame, or "cap," may be seen surmounting the candle flame.

When a Davy safety lamp is taken into an atmosphere of this description the presence of inflammable gas in the air is indicated by the presence of a pale flame filling the gauze chamber and eventually causing extinction of the lamp flame, or if the quantity of inflammable gas be insufficient to produce a mixture which burns within the gauze chamber it may yet be present in sufficient quantity to cause the oil flame to "spire" or become elongated and smoky. If the wick of the lamp be turned down until the oil flame has become almost non-luminous, the presence of as small a proportion as 3 per cent of fire-damp in the atmosphere may be detected by the presence of a pale flame cap over the oil flame.

In 1881 MM. Mallard and Le Chatelier recognising that the employment of a luminous flame reduced to very small dimensions in the attempt to render it non-luminous is less useful for this test than a larger flame which is naturally non-luminous, proposed the use of a hydrogen flame in place of the oil flame. The process of generating hydrogen proposed was, however, too cumbersome for practical use, and trouble was experienced in regulating the size of the flame; and it was not until about the year 1890 when Dr. Clowes applied small cylinders of compressed hydrogen to this purpose that the hydrogen flame test became of practical utility. Dr. Clowes has invented a lamp consisting of a combination of the Davy safety lamp with a cylinder of compressed hydrogen. The cylinders had to be manufactured of sufficient strength and capacity to safely carry an ample supply of gas for testing purposes without materially affecting the weight or portability of the lamp. All difficulties have, however, been overcome, and the lamp is now extensively employed in coal mines.

By means of the hydrogen flame used in this lamp very small proportions of fire-damp or of

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coal-gas can be detected and quantitatively estimated, the length of the flame-cap increasing with the proportion of inflammable gas present; while if the inflammable gas be present in dangerous quantity the flame is at once extinguished without igniting the explosive mixture in which it is exposed. The lamp may therefore be carried into an inflammable atmosphere without danger.

Disastrous explosions have occurred in the empty tanks of steamships used for the transport of petroleum owing to an explosive mixture

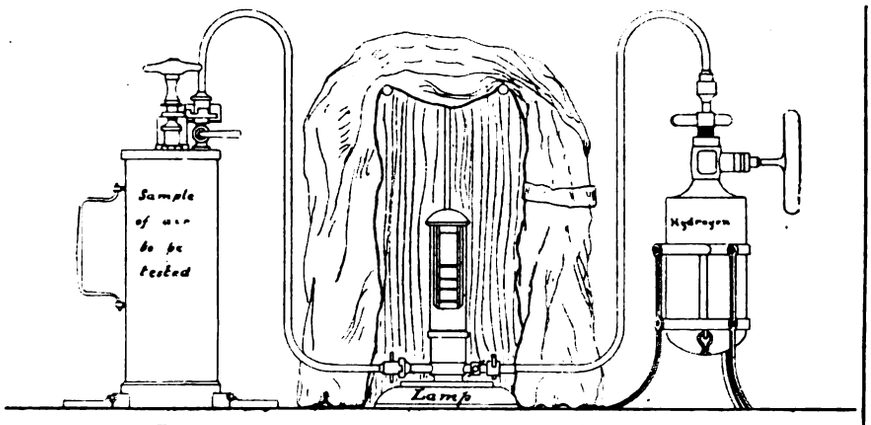

Fig. 46.—Apparatus for Detecting Inflammable Gas in Air.

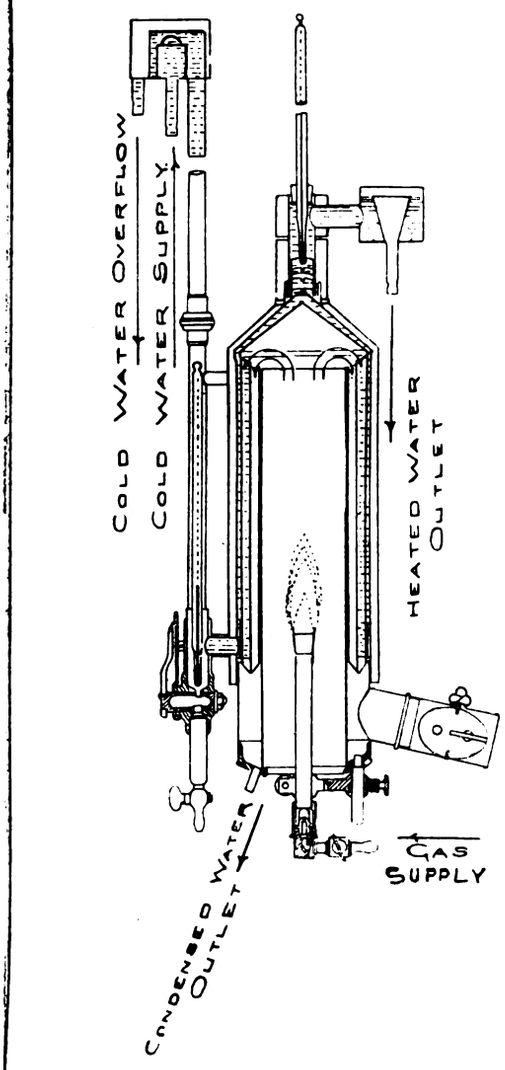

Fig. 47.—Junker's Calorimeter.

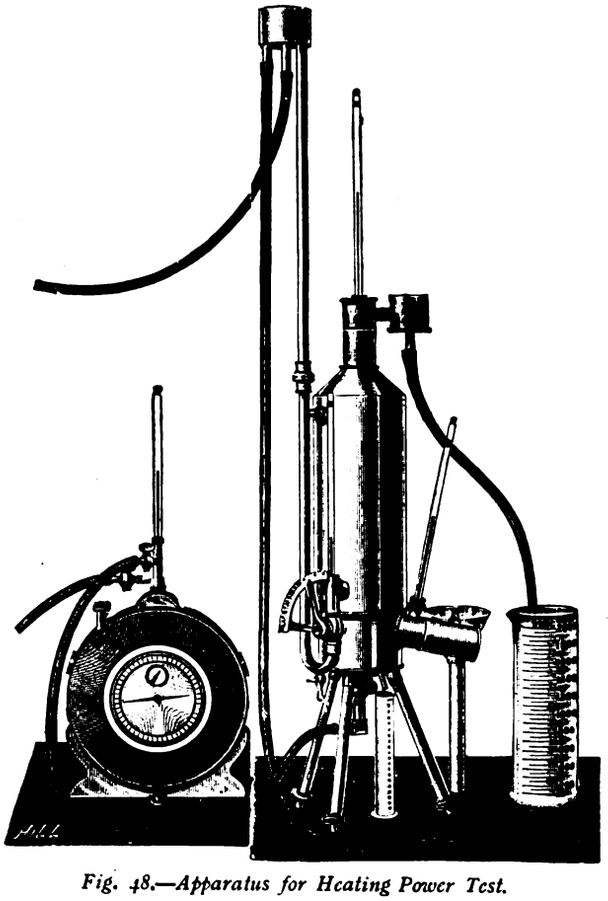

Fig. 48.—Apparatus for Heating Power Test.

of air and petroleum vapour having been formed within the tank and ignited by red-hot rivets or by lights taken into the tanks by workmen employed on repairs. Dr. Boverton Redwood, co-operating with Dr. Clowes, has adapted the hydrogen flame test for testing the atmosphere of the tanks of petroleum steamships, and after a steamship has discharged its cargo of oil it is now obligatory that the tank atmosphere be tested before any person is allowed to enter the tank.

The testing apparatus devised by Dr. Redwood is shown in fig. 46.

The sample of air to be tested is collected under compression in a small metal cylinder by means of a pump. When being tested the air is led through a pipe to the base of the lamp, and flows around the hydrogen flame as it rises to the top of the lamp and escapes into the outer air. A series of wire baffles, through which the sample of air to be tested must pass, is provided in the lower part of the lamp, so that should the air sample be explosive the flame cannot flash back into the metal reservoir. The hydrogen supply for the lamp is obtained from a cylinder of the compressed gas of any convenient size. Behind the lamp is an upright metal rod with horizontal arms to support a black cloth, which is provided to enable the examiner to screen off external light and to observe the height of the non-luminous hydrogen flame, and (if the air tested contain inflammable gas) the height of the flame-cap, through the glass front of the lamp.

The standard height to which the hydrogen flame should be adjusted is 0·4 in., and Dr. Redwood finds that a distinct cap is visible when the proportion of petroleum vapour amounts to one-ninth of the quantity which will make the mixture inflammable, or one-eighteenth of the quantity which renders it explosive, and considers that if the interior of the tank or other confined space be ventilated until a sample of the atmosphere within it is found to give no flame cap with this apparatus an ample margin of safety will be provided.

It has not yet been found possible to distinguish a flame-cap caused by the presence of fire-damp from a flame-cap caused by the presence of petroleum vapour. Further information relating to the detection and estimation of small quantities of inflammable gas or vapour in air may be obtained by reference to the Cantor lectures delivered by Dr. Clowes before the Society of Arts in 1894, and to the paper read by Mr. Boverton Redwood in the same year before the Institution of Civil Engineers, but from the brief outline which has been given of the method now commonly used for testing the atmosphere of coal mines and oil tanks it may be seen that the hydrogen flame cap test may be applied to any atmosphere suspected of containing inflammable gas or vapour in dangerous quantity. Dr. Clowes states that with his lamp a visible flame-cap is obtained when as small a proportion as 0·1 per cent. of coal gas or of fire-damp is present in the atmosphere.

A number of instances will occur to the mind of the architect and engineer in which reliable information on this subject would be most valuable. Paints containing benzene or other light oils sometimes impregnate the atmosphere of the structures (such as the holds of ships) in which they are used with a dangerous proportion of inflammable vapour, and the lamp may also be used for testing the atmosphere of vaults, sewers, and subways.

The Heating Power Test. — Reference has already been made to the great difference in the relative heating values of coal gas, water gas, and Mond gas. The determination of the calorific power of a gas is an extremely simple process, and may be made with sufficient accuracy for all practical purposes in a very short time by means of Junker's calorimeter. The heat generated by combustion of the gas is transmitted to a current of water flowing at a constant rate, and observations are made of:—

1. The quantity of gas burned.
2. The quantity of water heated.
3. The increase in the temperature of the water heated.

The calorimeter is shown in section in

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fig. 47, and the complete apparatus required for testing is shown in fig. 48.

The gas to be tested is led through the meter to an atmospheric burner which forms part of the calorimeter. The gas is consumed at about the rate of 6 cubic feet per hour if coal-gas is being tested, but at a greater rate if the gas is fuel-gas of low heating power. The burner is surrounded by a vertical double-wailed cylinder, and the hot products of combustion escape through a number of copper tubes passing down between the walls of the cylinder. The heated gases pass down through the tubes while the flowing water ascends outside the tubes. The tubes terminate in a common chamber in the bottom of the cylinder, and the uncondensable gases escape through the throttle at atmospheric temperature. The water flows through the calorimeter at a constant rate owing to the fact that the inlet device is provided with an overflow, and water is supplied to the instrument at a greater rate than it is allowed to flow through it.

The rate of flow is regulated until it is found that the temperature of the water flowing out of the calorimeter is between ten and twenty degrees C. higher than the temperature at the inlet. When the test is commenced the volume of water heated is carefully measured in a graduated cylinder of two litres capacity, and a reading of the gas meter is made. During the test readings of the thermometers at the inlet and outlet are made at short intervals and recorded.

The gross heating value of the gas in calories is found by the following equation :—

$$\frac{\text{Number of litres heated} \times \text{by increase in temperature of water.}}{\text{Cubic feet of gas consumed.}}$$

The hydrogen contained in the gas is converted into water which condenses in the calorimeter, and gives up its latent heat to the circulating water. When gas is used as a fuel in practice the water formed escapes as steam and is not utilised. The latent heat is, therefore, usually deducted from the gross heating value, and the resultant figure is termed the "net" calorific value. The water condensed from the products of combustion is collected in a cubic centimeter measuring cylinder, and for every c.c. collected a deduction of 0·6 calorie is made. If 53 c.c. of condensed water were obtained from 2·0 cubic feet of gas, a deduction of 15·9 calories should be made from the gross heating value, thus :—

$$\frac{0{\cdot}6 \times 53}{2} = 15{\cdot}9 \text{ calories.}$$

The heating value of a gas is usually expressed in calories or British Thermal Units. A *calorie* is the amount of heat required to raise the temperature of one litre or one kilogramme of water one degree C., while a *British Thermal Unit* is the amount of heat required to raise 1 lb. of water one degree F. To convert calories into B.T.U. multiply the calories by 4 (or more correctly by 3·968).

GENERAL BUILDING NEWS.

PARISH CHURCH, FYVIE, ABERDEEN.—Additions and alterations to this church have now been commenced. The whole area of the church is to be re-seated with pitch-pine seats. The interior of the chancel and the apse will be finished with an oak dado and finely-dressed Corennie granite throughout, with open oak beam work. A new chamber will be provided for the organ. The only part of the present church that will be taken down is the eastern gable between the galleries, and the latter will be connected by a dressed granite arch, spanning from the gallery to the ceiling. In front of the organ will be the choir. The walls of the eastern end of the apse will be filled with the three-light stained-glass window at present being manufactured by the Tiffany Company, New York. The two stained-glass figure windows at present in the church will occupy the north and south sides of the new apse. The floor of the chancel and apse will be 3 feet higher than the floor of the body of the church. The three or four steps leading up to it will be of white marble, and the whole of the chancel and apse flooring will also be of marble. Connected with the new chancel will be a new vestry and session-house. The present church was opened in 1800. The contractors as far as appointed are :—Mason work, Messrs. Morgan & Co., Aberdeen ; carpenter work, Messrs. M'Robbie and Milne, Aberdeen ; and slater work, Mr. Pirie, Fyvie. The architect is Mr. Marshall Mackenzie, of Aberdeen.

ST. LUKE'S CHURCH, WOODSIDE, CROYDON.—This church, after being partly rebuilt and enlarged, was reopened on the 13th ult., although the work is not quite finished in regard to a few details. The rebuilt portion is 59½ ft. in width, and 52½ ft. in length. It is considerably more lofty than the old structure, which has been entirely replaced or practically so, for at the north-west end there remains but a small fraction of the roof. The complete design provides for two more bays, with an end wall and porch, set off with turrets. A temporary entrance has been made there, and on the south side, opening to Spring-lane, there is a new door. The chancel, previously partly occupied by pews, is now clear. The roof is supported by transverse brick and stone arches, and these mark off the bays, which are arched between. There is accommodation for a congregation of about 500. The flooring is of wood block, with red tiles in the aisles. The windows, save for stained memorial glass which was part of the former edifice, are all of plain glass. With the completion of the building there will be a fine broad window at the west end. The artificial lighting is by incandescent gas, and this, with the heating by the radiator system, has been carried out by Messrs. Crittall & Sons, of Noel-street, London. The builders are Messrs. E. P. Bulled & Co., of Croydon, and the architect is Mr. W. D. Caroë.

NEW FREEMASONS' HALL, OSWESTRY.—On the 18th ult. the foundation-stone of the Freemasons' Hall, which is to be erected at the junction of Roft-street and Market-street, Oswestry, was laid. The building will consist of a hall 33 ft. by 22 ft., and a dining-room 23 ft. by 18 ft., which can be thrown into the hall when required, with retiring-rooms and other conveniences. On the first floor there will be a room, to be used for Masonic purposes only, 33 ft. by 23 ft., and a tyler's room 23 ft. by 18 ft. A caretaker's house will also be attached, containing five bedrooms, kitchen, bathroom, &c. The Roft-street front will be carried out in the Renaissance style, and the rest of the treatment will be Domestic Renaissance. The building will be faced with red brick and buff terra-cotta dressings. It will be warmed throughout by hot water, and fitted with the electric light. The cost is estimated at about 2,000*l*. Messrs. Griffiths & Sons, of Ellesmere, are the contractors. The architect is Mr. W. H. Spaull, of Oswestry.

RESTORATION OF WETWANG CHURCH, NEAR DRIFFIELD.—On the 25th ult. the parish church of Wetwang, near Driffield, was reopened after being restored. An oak screen has been placed across the transept to form a chapel for weekly services, and the altar from the late chancel re-erected in it. The north aisle has been converted into a vestry, with oak screens, and the church is re-roofed. There is also an oak screen to the tower arch. The builders were Messrs. Thompson, of Peterborough, and Mr. Hodgson Fowler, of Durham, was the architect.

HOSPITAL, HESWALL.—The foundation-stone was laid on the 25th ult. by the President of the Local Government Board of a hospital which is being erected at Heswall for the treatment of tuberculosis cases by the joint Poor Law Unions of West Derby, Liverpool, and Toxteth Park. The site for the hospital is on the hillside at Heswall, and commanding extensive views of the estuary of the Dee and Wales, the total area of the land acquired being about fifteen acres. The buildings are to be erected with the main front facing due south, the outside facings carried out with Connah's Quay bricks relieved by red pressed Ruabon brick strings and arches. The administrative block will be placed in the centre and contain the various rooms necessary for the staff. Immediately in front of the first floor will be an open-air sun bath, divided, for both sexes. On either side of the administrative block will be two wings two stories high containing dormitories for twenty-four patients, viz., twelve male and twelve female, divided on either side for two dormitories containing three patients each, and six dormitories for one patient in each. To every patient 1,000 cubic feet of air space will be allotted. All the windows will be made to open as casements, and all the rooms heated when necessary during the very inclement weather. Separate bath and lavatory accommodation will be provided on each floor for each sex, and separate staircases provided for the two sexes for ordinary use and in case of fire. The dining-hall is to be in the rear of the main building, connected by corridors with cross ventilation, and fitted complete with the usual kitchen and other offices. The water supply will be from the West Cheshire Waterworks. The total cost of land and buildings will be about 12,000*l*. The contractor is Mr. Thomas Spencer, of Aintree, and the architect is Mr. Charles H. Lancaster.

BUSINESS PREMISES, UNION-TERRACE, ABERDEEN.—On the 20th ult. the new buildings erected in Union-terrace, Aberdeen, for the Scottish Legal Life Assurance Society were formally inaugurated. The plan consists of two shops, with back saloons and cellarage on the ground floor, and the first, second, and third floors are arranged as suites of offices, with accommodation for a caretaker in the attic floor. The entrance and vestibule doors are of mahogany, panelled and moulded, the vestibule door being glazed with bevelled plate-glass, and the fanlight of the outside door is filled in with a wrought-iron grill and shield, with raised brass letters "Scottish Legal Chambers." The stair from the ground to the first floor is of turin stone, with a dado of coloured glazed tiles. The staircase from the first floor to the attics is of an elliptic form, with large windows filled with leaded glass, with the monogram of the company embossed on a shield. The front elevation of the building is faced with fine-axed Kemnay granite, except the piers of the shops and at the entrance doorways which are of polished Peterhead granite, with moulded capitals and bases of Kemnay granite. The elevation is divided into three boldly-designed bays, with mullioned oriels running up two stories, and surmounted with three large elliptic arches, with moulded voussoirs and key-stones panelled on the face. These arches spring from double columns of clean-cut Kemnay stone, having moulded capitals and panelled and moulded bases. The third story is a flat surface, pierced with five semi-circular windows, with moulded rybats and key-stones divided from each other by three-quarter projecting circular columns, with moulded caps and bases. Above, there is the main cornice, formed with moulded dentil trusses and dentil blocks. Surmounting the main cornice is a moulded balustrade, and in the centre there is a pediment, with arched windows and terminated with a boldly-designed finial. The building is fitted up with the electric light. The following are the contractors :—Messrs. G Fordyce & Co, masons ; Leslie & Hay, carpenters ; Sellar & Co., plasterers ; Forbes Morrison, slater ; John Campbell, plumber ; George Donald & Sons, painters ; George Bisset, ironwork ; and the Aberdeen Electrical Engineering Co. The grates were supplied by Messrs. Marshall & Philip. Mr. George Sutherland, of Aberdeen, was the architect.

VOLUNTEER HEADQUARTERS, GLASGOW.—The new Volunteer headquarters building, situated at the south-east corner of Yorkhill drill-ground, with frontage to Gilbert-street, has now been completed. It is built of red brick faced with stone, and castellated. It also provides headquarters for the Volunteer Medical Staff Corps. Their entrance is from Gilbert-street, and comprises a drill-hall 70 ft. by 40 ft., store for ambulance waggons, armoury, sergeants' mess, &c. The drill-hall for the Volunteer battalion measures 142 ft. by 74 ft. Access is provided at both ends, the principal entrance being to the east. On the same level, towards Gilbert-street, and in direct communication with the drill-hall, are placed a large reading-room for the men, 70 ft. by 30 ft., and a sergeants' mess, 38 ft. by 24 ft., with buffet. Rooms for commissioned officers and adjutant occupy the remainder of the frontage. The officers' quarters are on the first floor, and include mess and billiard rooms, dressing-rooms, and lavatories, while on the attic story accommodation is provided for the sergeant-major, the resident official. Underneath the drill-hall, on the basement floor, a rifle-range has been formed. The building is heated by means of hot-water pipes on the low-pressure system, and is lighted throughout by electricity. Mr. Wm. H. M'Nab, of West George-street, Glasgow, is the architect.

OPENING OF ST. SAVIOUR'S CHAPTER-HOUSE, SOUTHWARK.—The Bishop of Rochester on the 28th ult. opened a Chapter-house for St. Saviour's, Southwark. The building which has been acquired for the purposes of the Chapter was originally the Chapel of St. Thomas the Martyr, which was founded in 1213. It is situated in St. Thomas-street, Southwark, in the neighbourhood of Guy's Hospital. Since the building has been taken over by St. Saviour's it has undergone several alterations, and has been thoroughly cleaned and redecorated. A feature of the house is a fine old oak gallery which runs round the northern and western walls. The reredos and communion-table, also of oak, have been allowed to remain, and the old chapel seat have been broken up and utilised for the purpose of panelling the walls. The building is fitted with the electric light, and is amply furnished with new chairs. The architect was Mr. Arthur Bartlett, of Chancery-lane.

RESTORATION OF LADY CHAPEL, ST. DAVID'S CATHEDRAL.—This Lady Chapel, which has recently been reopened after restoration, was built by Bishop Martyn, whose tomb is in the north wall of the chapel, some time between 1290 and 1328. In style it is almost identical with the later Early English work adjoining it. The *Western Mail* states that in some respects it is not very dissimilar to the Lady Chapel at Llandaff, though differing greatly in proportion, that at Llandaff being tall and slender, with lofty windows, whereas that at St. David's partakes of the general character of breadth and lowness which distinguishes the whole cathedral. During several centuries the chapel was allowed to fall into disrepair, and its dilapidated condition, together with that of the two adjoining chapels, appeared all the more desolate by contrast with the remainder of the cathedral. The restoration just completed has been carried out in a conservative spirit. The ceiling of the Lady Chapel is a fine stone groined one, starting from the six old springers, which, with the old well, were found to be sufficiently strong to carry out the vaulting. The ribs are of Doulting stone. In the horizontal ribs, running due east and west, are five old bosses belonging to the previous vaulting, which collapsed about 130 years ago, and it was from the plan of these that the present vaulting was constructed. In the same rib are two new bosses containing the arms of the late bishop, Dr. Basil Jones, and of the present bishop, Dr. Owen. The intermediate ribs have

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at the intersecting angles the arms of the three late deans — Lewellin, Allen, and Phillips. Bishop Martyn's tomb and the sedilia have now been restored, with as much of the old work left as possible. In the centre of the tracery work is a shield with the arms of Bishop Martyn and of the diocese. The altar base is a raised dais of two steps, inlaid with encaustic tiles, the altar itself being of carved oak, having four panels, with monograms in raised letters on shields, and carved buttresses. The east window is an example of the Decorated period, the other four windows being in the Perpendicular style. The ante-Chapel, locally known as "The Seven Sisters' Chapel," is entered from the north and south aisles by two pairs of Early English arches, with moulded bases and capitals. Mr. J. Oldrid Scott was the architect.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Messrs. Pollard & Brand, builders, have removed from 19, Pelham-road to 32, Summerhill-road, South Tottenham, N.

OLD SOUTHAMPTON.—At the meeting of the Hampshire Field Club and Archæological Society, held on the 17th ult. at Southampton, a number of buildings of historic interest were visited by the members. Amongst other places seen was the French Protestant Church, otherwise known as "God's House," or the Hospital of St. Julian. Here the President of the Society read a paper on the building. He stated that among the earliest settlements of Protestant refugees from Flanders and from France, having "churches" allotted to them, were those in London, Norwich, Canterbury, and Southampton; other congregations were formed at various periods at Sandwich, Rye, Winchelsea, Yarmouth, Colchester, Stamford, and Thetford, in the east of England; at Dartmouth, Plymouth, and Stonehouse in the south; and at Exeter, Barnstaple, and Bristol in the west. Of all the churches founded by the refugees none are more interesting than those of Southampton and Canterbury, which still survive. Of the records and registers remaining, the most ancient are those of Southampton, the first entries of which commence in the reign of Queen Elizabeth in 1567, and continue until the year 1797. The registers of the French Church at Southampton are now preserved at Somerset House. Although the first entries of the registers date from 1567, it is clear that this church of the refugees was first established by King Edward VI. The building itself originally formed the chapel of an ancient hospital dedicated to St. Julian. The party subsequently walked to the West Gate, near West Quay (thirteenth century). This gave entrance to the town from the earliest quay constructed as a landing place for the mediæval port. In the ancient room known as the Guard Room (fifteenth century) situated on the wall adjoining the West Gate the Rev. G. W. Minns read a paper on the building. He remarked that the history and purpose of this spacious upper chamber or solar cannot possibly be determined. It probably served as a guardroom, dormitory, or store in connexion with the neighbouring tower of the West Gate, from which it was entered by a door at the north end, the jambs of which may still be seen. It is proposed when opportunity occurs to restore this ancient approach. The building, as originally constructed, consisted of a stone basement, or plinth, the upper walls formed by studwork of oak, the interstices being filled with "wattle and daub," that is wattle or hurdle work over which clay was daubed, the face of the work being finished with rough cast or mortar. The architectural details of the chamber are of plain character, and indicate the date of the building to be of the fourteenth, or early in the fifteenth century. The roof, apparently of chestnut, is constructed with massive tie beams, king posts, purlins, and braces worked by the adze, the tenons secured by wooden pegs. The rafters have been extended to the rampart wall, but originally terminated on the outer wall of the chamber, the space between which and the parapet was open to the sky, and afforded an uninterrupted path for the military guard. He hoped that this interesting architectural feature would at some future time, in conjunction with the neighbouring West Gate, be more completely restored, after the manner of, and with the same purpose as, the West Gate at Winchester, which has been converted by the citizens into an attractive Municipal Museum. After leaving the ancient Guardroom the members spent much time in looking over the Tudor House in St. Michael's-square, which has recently been restored by Mr. W. F. G. Spranger, and the Mediæval Hall, or Undercroft, in the old Simnel-street. After luncheon the party visited the Norman House, called in Duthy's Hampshire "King John's Palace," and which contains the remains of a domestic building of the Norman period. The adjoining Norman arch was the next halting place; it was stated to have been one of the store houses of the old Norman Castle. Subsequently, the well-known Bargate was visited, after which the plans of Mr. R. M. Lucas for widening the side openings of the gate were inspected.

NEW RIVER WATER SUPPLY.—At the Surveyors' Institution, on the 23rd ult., Mr. Howard Martin, member of the council of the institution, sat as arbitrator in a dispute between the New River Company and the Provost and College of Eton. Mr. Freeman, K.C., with Mr. Arthur Shaw, appeared for the college, and Mr. Boyle, K.C., for the water company. In opening, Mr. Freeman said the company, under an Act passed in 1897, were empowered to carry out certain works to provide a further supply of water for London, the scheme necessitating the running of a pipe across the Wilds Estate of 300 acres at Hampstead, the property of the college. For the laying of that pipe the company proposed to acquire outright a strip of land across the estate amounting in all to two acres. The arbitrator was asked to decide what was the value of that land, and the amount of damage caused to the present owners by the severance. The estate would shortly be laid out for building purposes, and in counsel's opinion would rapidly develop in consequence of the facilities to be afforded by the extension of the Middlesex Tramways and the construction of an electric railway from Waterloo and Charing Cross. Five acres of the estate had been already sold at the price of 1,000*l.* per acre, and the college considered that the land to be acquired by the water company was worth 800*l.* per acre, with 10 per cent. for compulsory sale, and compensation was asked for damage by severance. In the present case it was not merely a matter of easement, but the company wanted the freehold of the ground through which they ran their pipe. Another matter which had to be considered was the difficulty that would arise when it was found necessary to construct sewers on the estate. The land so sloped that the drain would have to be carried across the line of the water-pipe, and by an undertaking entered into in March last, the college were bound not to build anything that would reach to within 4 ft. of the pipe above, and any sewer that was constructed was to be placed at such a depth as the engineer to the water company might reasonably require for the protection of the aqueduct. The company had said nothing as to the depth at which they were going to place their pipe, and it was, therefore, impossible to estimate the extra expenditure involved in running the sewer at whatever depth would be necessary to avoid the pipe. Counsel then called witnesses in support of his statement. They all agreed that the running of the pipe across the estate would necessitate the laying of the sewer at a low level, and consequently large extra expenditure. For the company Mr. Boyle said his witnesses estimated the value of the land at 200*l.* per acre. It was purely an agricultural district, and not likely to develop for building purposes for very many years. With regard to the land already sold at 1,000*l.* per acre, that had been purchased in order to enhance the value of adjoining land belonging to the purchasers. He considered that the pipes would not interfere with the drainage question at all, as it might be spread over different districts and not carried out in bulk as suggested by the college, and therefore the result of the acquisition of the land by the company would not mean any further expenditure. Expert evidence was taken with regard to the probability of development of the land for building, and on the question of drainage, and counsel afterwards addressed the arbitrator. Mr. Martin reserved his award.—*Times.*

TRURO CATHEDRAL DAMAGE. — The Truro Cathedral Building Committee on the 24th ult. reported to the Diocesan Conference that serious anxiety and painful disappointment had been caused by signs of fracture in eight of the Bath stone bases of the nave piers. Investigation showed that there was nothing to indicate anything amiss with the foundations or any settlement of the building, and the architect had reported that it was clearly a case of imperfect bedding. The Committee added that the cracked stones could be replaced, if necessary, by a very costly and possibly dangerous process, involving the underpinning of the arcades. But, before undertaking so serious an operation, they had decided, with the concurrence of the architect and contractor, to invite some thoroughly competent architectural expert to inspect the building and advise the Committee thereon.—*Standard.*

CROMWELL STATUE, ST. IVES.—On the 23rd ult. a statue of Oliver Cromwell, by Mr. F. W. Pomeroy, was unveiled at St. Ives. It is placed in the centre of the Market Hill, opposite the Free Church, and faces towards the station. The statue is in bronze, on a pedestal of Portland stone 8 ft. high. This is also the height of the figure, which represents Cromwell in the garb of a country gentleman of the period. He is wearing a sword, and under the left arm is a Bible. His right arm is pointing downwards. The pedestal rests on a granite base, and at the corners are four granite blocks, on which are placed gas standards, of a design in keeping with the general character of the work. The stone bears the following inscription on the different sides: "Oliver Cromwell, 1599-1658; a townsman of St. Ives 1631 to 1636; erected by public subscription 1901; H. I. Hankin, Mayor; G. D. Day, Town Clerk."

BUILDING ACTIVITY IN ABERDEEN.—The Plans Committee of the Town Council has sanctioned the plans of the following buildings:—Two dwelling houses on the west side of Bon-Accord-street, for Mr. Henry Duncan, granite merchant; dwelling-house on the north side of Fonthill-road, for Mr. John Brodie, fishcurer, per Messrs. Cameron and Watt, architects; dwelling-house on the south side of Albyn-place, for Mr. Peter Bisset, builder, per Mr. George Sutherland, architect; alterations in connexion with warehouse on the west side of Commerce-street, for Messrs. Milne Brothers, grain merchants, per Mr. W. E. Gauld, architect; two dwelling-houses on the west side of Murray-terrace, for Mr. James Melville, Deemount-road, per Mr. George Sutherland, architect; two dwelling-houses on the west side of Murray-terrace, for Mr. Alexander Wright, granite merchant, per Mr. George Sutherland, architect; addition to box factory on the east side of Crombie-road, for William Fiddes & Son, Ltd., box manufacturers, per Mr. Duncan Hodge, architect; granite-dressing shed on the south side of Affleck-street, for Messrs. Henderson & Webster, granite merchants, per Mr. Duncan Hodge, architect; granite dressing shed on the west side of Holland-street, for Messrs. Dunn Brothers, granite merchants, per Mr. Duncan Hodge, architect; alterations and additions in connexion with bakery on the south side of Queen-street, for Mr. Thomas Mitchell, baker, per Mr. R. G. Wilson, architect; stable and cart-shed on the north side of Poynernook-road, for Mr. John Brodie, fish merchant, per Messrs. Cameron & Watt, architects; shed on the east side of Berryden-road, for the Northern Co-operative Co., Ltd., per Mr. R. G. Wilson, architect; fish-curing premises on the west side of North Esplanade, for the Scottish Co-operative Wholesale Society, per Mr. J. Davidson, Morrison-street, Glasgow.—*Aberdeen Free Press.*

PUBLIC WORKS, EDINBURGH.—The convener of the Streets and Buildings Committee of the Edinburgh Town Council has issued to the members of his Committee a report showing the extent of the works undertaken by the several departments under the Committee's direction, as well as a statement showing the actual expenditure of the Committee for 1900-1901, and the estimated expenditure for 1901-1902. The annual expenditure for the upkeep of macadamised streets approximates 14,000*l.*, while in the case of causewayed streets it amounted to 15,000*l.* in the past year, and in the current year will cost over 18,000*l.* For new work and general repairs on the public footpaths of the city the expenditure involved is fully 10,000*l.* per annum. The large amount of work undertaken by the department in the making up and construction of new streets and footpaths (the cost of which is recovered from proprietors) may be measured by the expenditure on this account, amounting to about 12,000*l.* per annum. The expenditure for the upkeep and repair of sewers within the city amounts annually to between 6,000*l.* and 7,000*l.* This is exclusive of the charge for sinking fund and interest in respect of capital expenditure on new outlet sewers, such as that recently constructed in the Morningside district. In the current year a capital expenditure of 6,000*l.* for extension of general main sewers is estimated. The marked increase in the capital expenditure of the Committee for this year, as compared with last year (18,000*l.* compared with 5,000*l.*), is explained by such items as Bonnington Bridge, Portobello Promenade, and other improvements to which the Council has been committed for some time. It is pointed out that the expenditure supervised by the Committee represents nearly one-fifth of the total annual expenditure of the city. With regard to the widening of Canonmills-road, it is stated that the negotiations regarding this improvement are now practically completed, and that the work will be immediately proceeded with. With regard to the Bonnington Bridge, arrangements have been made by the burgh of Leith and the Town Council for the erection of a widened and improved bridge. The National Telephone Company are now to proceed with the formation of the underground telephone way (at a cost of about 25,000*l.*), the estimates having been adjusted this week. Under the head of ordinary expenditure last year the actual amount was 71,871*l.* 10s. 10d., and the estimate for this year is 75,205*l.*, while the actual capital expenditure last year was 5,631*l.* 17s. 11d., and the estimated expenditure this year is 18,100*l.*, making a total estimate for this year of 93,485*l.*, as against an actual expenditure last year of 77,503*l.* A report by the city road surveyor for the year ending May 15 last states that the total number of workmen then employed in his department was 206, and the wages paid during the year amounted to 13,561*l.* The total mileage of streets in the city is 163 miles. The work in hand at present, or in contemplation, includes:—(1) Formation of new approach avenue to Colinton Mains Hospital, for the Public Health Committee—estimated cost, 5,400*l.*; (2) formation of new roads at Quarryholes, Easter-road, on the lands of Trinity Hospital—estimated cost, 1,450*l.*; (3) rebuilding of Bonnington Bridge—estimated cost, about 8,000*l.*; (4) the opening up of about twenty-six miles of streets for the laying of underground pipes and conduits for the National Telephone Company, at an estimated cost of 26,000*l.* The cost of laying granolithic on foot-pavements in Portobello since May 15 last amounted to 1,359*l.* 8s. 7d.—*Scotsman.*

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CAPITAL AND LABOUR.

SOUTHPORT BUILDING TRADE.—On Monday night an agreement was come to between the master joiners and men in Southport by which a farthing an hour was formally registered. Hitherto the pay has been 9d. per hour. On and after November 1 it will be 8¾d. This will affect about 130 workmen, exclusive of those engaged on the Pier Pavilion.

LEGAL.

BUILDING DISPUTE AT TORQUAY.

IN the Chancery Division on the 25th ult. Mr. Justice Buckley had before him the case of the Torquay Hotel Co. *v.* Bell, on a motion by the plaintiff company for an *interim* injunction to restrain the defendant until the trial of the action or further order from erecting any building or addition to any existing building except in accordance with certain covenants and from opening any lights in any buildings within a distance of 15ft. from the hotel.

Mr. Astbury, K.C., in support of the motion, said that the matter was rather a complicated one. The plaintiffs owned a large hotel at Torquay, which stood in a fine position and in very secluded grounds. The property was sold under covenants which restricted any adjoining owner as regarded building, and the defendant bought his property under an express covenant which provided that the hotel should not be interfered with, and by which he was to obtain the consent of one of two gentlemen to any building he might propose to erect. One of the covenants was that he was not to open any window overlooking the hotel grounds within 15 ft.

Mr. Henry Terrell, K C, for the defendant, said that everything that the plaintiffs complained of, with the exception of one window, had been put right before the action was brought.

His Lordship remarked that the question then was merely one of costs.

After some discussion it was stated that the parties had come to terms. The defendant undertook not to use the flat roof of his building for drying clothes, and to put ground glass in the window complained of, and each party to pay their own costs of the action.

His Lordship accordingly made no order on the motion.

WEST-END BUILDING DISPUTE:

ORDER TO COMMIT FOR CONTEMPT OF COURT.

THE case of Bailey *v.* Lewis came before Mr. Justice Cozens-Hardy in the Chancery Division on the 24th ult, an action brought by the trustees of the Portland Estate against Mr. John Lewis, draper, of Oxford-street and Holles-street, to restrain a breach of covenant not to build other than private houses on land fronting Holles-street, where Mr. Lewis is extending his trade premises. On February 8 last, judgment was given, granting a mandatory injunction directing Mr. Lewis to pull down buildings already erected by him, and on August 2 the plaintiffs moved to commit Mr. Lewis for contempt of court in not complying with the injunction. His Lordship then directed the motion to stand over, but intimated that if the building in question was not pulled down by the end of the Long Vacation, an order for committal would be made as of course.

Mr. Vernon Smith, K.C., in support of the motion for committal, stated that practically nothing had been done to obey the mandatory order to pull down. He also informed his lordship that Mr. Lewis had placarded with posters the hoarding he had put up contrary to his rights.

Mr. Eve, K.C., for the defendant, said that no relief was sought on the ground of the posters, and so far as the motion before the Court was concerned, it was arranged on the last occasion that there was to be no discussion if the order had not been complied with, and his lordship stated that if this were not done, the writ of attachment would issue forthwith.

His Lordship: You are not in a position to resist the order.

Mr. Vernon Smith said, from the attitude the defendant had adopted, the plaintiffs feared that the order would never be observed unless some one was appointed to do the work of pulling down.

His Lordship: We will try the effect of a few weeks in Holloway.

Mr. Eve stated that Mr. Lewis was the proprietor of a large business, and he asked to be allowed a week in which to make his arrangements. He would surrender in due course.

His Lordship: Mr. Lewis is not entitled to any indulgence. The order must take its usual course.

The order to commit was accordingly made.

Mr. Wallace appeared with Mr. Vernon South in support of the motion, and Mr. Edward Ford, with Mr. Eve, for the defendant.

On the 26th ult., a motion was made on behalf of Mr. Lewis that the writ might not go for a week, Mr. Eve stating that his client had in no way intended disrespect to the court, and that he had satisfied the plaintiffs that he was taking prompt steps to carry out what the order directed. The learned counsel further stated that the plaintiffs did not object to the application being acceded to.

Mr. Vernon Smith, on behalf of the plaintiffs, said this was so.

In the result his Lordship, as it appeared that the writ had already reached the hands of the Sheriff, allowed the plaintiffs to take from the Registrar a memorandum of instruction to the Sheriff not to proceed with the writ for a week. The learned Judge said that the application must be mentioned again to him on the next motion day, and Mr. Lewis must make an affidavit expressing his regret for the gross contempt he had committed, and showing that he had by then taken substantial steps towards the removal of the buildings complained of.

THE CORPORATION OF WEST HARTLEPOOL AND BUILDING PLANS.

THE case of the King *v.* the Mayor, &c., of West Hartlepool, *ex parte* Richardson, came before a Divisional Court of King's Bench composed of the Lord Chief Justice of England and Mr. Justice Ridley, on the 25th ult., on an application by Messrs. J. E. & H. W. Richardson for a prerogative writ of mandamus calling upon the Mayor and Corporation of West Hartlepool to approve of certain plans submitted to them for their approval.

It appeared that it was desired to erect a block of buildings in Stockton-street and Park-road, West Hartlepool, and on July 4 last Messrs. Richardson submitted plans of the buildings to be erected for the approval of the Corporation. The Corporation refused to give their sanction to the erection of the buildings according to the plans submitted, the reason of the refusal given by the Corporation being that buildings so erected would interfere with a public highway. Messrs. Richardson's case was that the street or way in question had never been dedicated to the public, nor used by the public, and was only used by the occupiers of certain cottages as a private way by the leave and licence of Messrs. Richardson. They further said that this street had never been repaired by the Corporation, nor had the Corporation ever called upon them to keep it in repair, and that the street and the cottages were in existence many years before the incorporation of the district with the Borough of West Hartlepool, and prior to the passing of the West Hartlepool Improvement Act, 1854. On behalf of the applicants it was now contended that since the existence of the highway alleged was in dispute, the Corporation exceeded their powers in refusing to approve of the plans for the building for the reasons given by them, and that the only question for them was whether the plans were in accordance with the by-laws as to the erection of new buildings.

At the conclusion of the arguments of Counsel the Lord Chief Justice, in giving judgment, said he did not think the *mandamus* ought to go. It could not be denied that the Corporation were the guardians of the highways of the borough, and that being so, he did not think that they ought to be compelled to approve of plans for new buildings which, in the honest opinion of that body, would interfere with a highway under their charge.

Mr. Justice Ridley concurred, and the application was accordingly dismissed, with costs.

Mr. C. A. Russell, K.C., and Mr. Naldrett appeared for the applicants, and Mr. Macmorran, K.C., and Mr. Pollard for the Corporation.

ANCIENT LIGHTS:

IMPORTANT CASE IN THE COURT OF APPEAL.

THE case of Warren and Others *v.* Brown came before the Court of Appeal, composed of the Lord Chief Justice and Lords Justices Vaughan Williams and Romer, on the 28th and 29th ults., on the appeal of the plaintiffs from the judgment of Mr. Justice Wright in the Queen's Bench Division on August 8, 1900. The case was reported in the issue of the *Builder* of August 11, 1900. The case raised a question of great importance in relation to ancient lights—namely, whether the right which is acquired by statutory prescription is a right to the continuance of substantially the whole quantity of light which has come to the windows during the twenty years, or is limited to a sufficient quantity of light for all ordinary purposes of inhabitancy or business. The facts were these. The plaintiffs were the owners and the tenant of a building in the town of Leicester, and they claimed damages and an injunction in respect of the obstruction of the access of light to windows more than twenty years old. At the trial the claim was limited to two rooms, one on the ground floor and the other above the former, both facing to the south. For a length of about 17 ft. in front of these rooms the defendant had raised his building from a height of about 20 ft. 6 in. to about 26 ft., but had set it back about 2 ft. or 3 ft., so that the width of the street between the two buildings, which was about 17 ft., became about 19 ft. Four out of the five windows in each of the two rooms are opposite to that part of the defendant's building which has been mentioned. Mr. Justice Wright found, as a fact, that the defendant had not obstructed or diminished to any material extent, if at all, the light coming to the upper of the two rooms in question. As regarded however the four windows on the ground floor, he found that the defendant had materially diminished the light which the plaintiffs enjoyed from those windows for twenty years past, but that abundant light remained for all ordinary purposes of inhabitancy or business, and that the room in its then state was better lighted than the ground floor rooms in many of the principal streets. The plaintiff Baum (the tenant of the premises) had for less than twenty years carried on in the premises, and particularly in the ground floor in question, a manufacture of hosiery by means of machinery which required a very exceptional quantity and quality of light for the accurate adjustment of filaments to fine needles. Prior to this manufacture the manufacture of boots and shoes, which required good but not special or extraordinary light, was carried on in the premises. His Lordship held that the defendant had by the acts complained of so diminished the light that it was materially insufficient during some part of the day for the special requirements of Baum's industry, and he found that the plaintiffs' premises had throughout the twenty years before action been suitable for such a manufacture as that carried on by Baum. He thought that the light as it then existed would have been sufficient for any but the most recent kinds of machines. His Lordship decided that the plaintiffs had made out no case for a mandatory injunction or for damages, and gave judgment for the defendant with costs, but in case he should be held wrong in his law on the appeal he assessed the damages at 100*l.* for the tenant and 200*l.* for the reversioners. Hence the present appeal of the plaintiffs.

Mr. Hugo Young, K.C. (with him Mr. W. H. Stevenson), for the appellants, said that Mr. Justice Wright had held that, although there was a substantial diminution of light coming to the plaintiffs' premises, there was enough light left for ordinary purposes, and therefore the plaintiffs were neither entitled to damages nor an injunction. His Lordship found as a fact that there was not enough light for the purpose for which Baum required it, but held that, inasmuch as the purpose for which he wanted it was a purpose which had not existed for twenty years, the plaintiffs could have no recompense. He (counsel) submitted that the moment he showed a substantial diminution of light—and the purpose for which he wanted that light was a reasonable purpose, and one reasonably connected with the premises—he was not to be debarred from using that light and claiming that light, because he had not used it to the full extent for twenty years. Mr. Justice Wright had found that the trade for which the light was required was common in the town, and that these premises for over twenty years were adapted for such trade.

The Lord Chief Justice: For how long had you been carrying on the hosiery business?

Mr. Young: For some seventeen or eighteen years. The foundation for all claims of this kind is that there must be a substantial and material diminution of light, and that Mr. Justice Wright had found in the plaintiffs' favour. The learned counsel, continuing said that the effect of Mr. Justice Wright's judgment would be that all houses, notwithstanding how desirably situated at present with regard to light, were liable to be reduced to a common standard.

Lord Justice Romer: I thought that in questions of substantial interference with light you could not go into questions of particular user. If I have a very light house, a person could not justify interference with it by saying, "I have left you enough light, and as good as nine out of ten houses in the street."

Mr. Young: No. Here we have got a house specially adapted for the present-day hosiery trade of Leicester, and our house has probably got better light than others. But we have not carried on that trade for twenty years, and then when we begin that trade a man comes and reduces that light so that it is no better than the light of other places where the trade is carried on. Mr. Justice Wright's decision is that as we have been left enough light for ordinary purposes, although not enough for the hosiery business we have carried on for some years, we have no remedy. The learned counsel contended that the plaintiffs in law were entitled to succeed, and cited a great number of cases in support of his submission.

Mr. Stevenson having followed on the same side,

Mr. Warmington, K.C. (with him Mr. Neilson), in support of the judgment in the Court below, said that Mr. Justice Wright had found that no damage had accrued to the plaintiffs except in regard to the extraordinary light required for a new and intricate piece of machinery recently introduced by the tenant, and in respect of that he had assessed the damages at 100*l.* for the tenant and 200*l.* for the reversioners in case he was wrong in the view he took of the law that they were not entitled to compensation.

Lord Justice Romer said that the learned Judge had found that a substantial amount of light had been obstructed, and that the plaintiffs had suffered damage to the amount mentioned because the tenant could no longer carry on his business in the old way.

Mr. Warmington could not assent to that, his reading of the judgment being that Mr. Justice Wright assessed the damages with reference to the application of the light to new machinery. The light as it now existed would have been sufficient

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for any but the most recent delicate machinery, and the lessor's grant must be limited to their lights as they existed at the time the agreement was entered into, or to such user as was then within the reasonable contemplation of the parties.

At the conclusion of the arguments their Lordships intimated that they would reserve judgment.

ACTION AGAINST ARCHITECTS.

THE case of Vaux & Son *v.* Wimperis & Arber came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 30th ult., on the appeal of the defendants from a judgment of Mr. Justice Grantham, sitting without a jury, in the King's Bench Division. The plaintiffs are engineers carrying on business in Sunderland, and the defendants are architects carrying on business in London. The plaintiffs brought the action to recover 238*l.* 7*s.* 8d. in respect of a portion of the heating apparatus of the New Palace Theatre at Blackburn, the defendants, it was alleged, having given the plaintiffs the order for the work. The matter arose out of a building contract by which a builder named Davidson contracted to build the theatre for 17,000*l.* By the contract the builder had to spend 350*l.* on the heating apparatus, and the order for this work was given to the plaintiffs. Subsequently the building owners having gone into liquidation, the defendants ordered from the plaintiffs extra heating apparatus, and it was in respect of this additional order that the present claim arose. Defendants pleaded that they were not liable as they were not the principals, but in the Court below Mr. Justice Grantham held that as Davidson was not responsible for an expenditure on heating of more than 350*l.*, and that inasmuch as the architects had given the orders in their own name without any qualification whatever, they were liable for the extra work performed by the plaintiffs. The defendants now appealed from this decision.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, said that the evidence in the case showed that the defendants had given the order to the plaintiffs in their own name, and that being so, they were liable to pay the claim to the plaintiffs.

The Lords Justices concurred, and the appeal was dismissed with costs.

Mr. Statham appeared for the appellants, and Mr. Montague Lush for the respondents.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

11,693.—TOPS FOR VENTILATING SHAFTS: *W. Cadman.*—A top for the up-cast shaft of a drain or sewer pipe, or some similar shaft, is fashioned in a conoidal or bulbous shape, perforated with holes in such a manner that the up-draught shall not be diminished. The particular form specified is devised in order to prevent birds from building nests in the shaft top.

11,694.—A TOOL FOR BORING HOLES FOR POSTS: *C. L. Tuttle.*—The auger has four sector-shaped plates which are secured to a crossbar at the lower end of its shaft which terminates beyond with a tapered feed-screw. The two plates that are attached to the underside of the crossbar are made with radial cutting edges turned downwards and cutting portions disposed vertically, they also have oblique setting-slots for their adjustment; the other two plates are hinged on to the upper side of the crossbar and their radial edges are turned upwards. There is an opening below the level of the cutters in the tubular shaft.

11,705.—A FLOORING CRAMP: *G. Kay.*—A plate and an adjustable pin grip the joist, the ears of the plate being joined with the pivot of the links which are joined with the pin—for which, however, a cam may be substituted; a lever which presses a plunger against the board is linked to the upper end of the first named link and is pivoted on to the plunger, which a pawl maintains in its position, the pawl being pivoted on to the plunger for engagement with teeth upon the upper ends of the links, or pivoted so as to engage with teeth upon the plunger.

11,907.—BLOCKS FOR GAS, ELECTRICAL, AND SIMILAR FITTINGS: *J. Bolton.*—The block, that can be fixed on an unplastered wall, is fashioned with countersunk holes for screws and with a hollowed back for waterproofed material, which is to be screwed in from the front; holes or a recess in the rear edge will take a pipe or casing or wires, and for metallic blocks a ring should be inserted over the gas or other fitting.

11,913.—ATTACHMENTS FOR SCAFFOLDING: *J. Fage and J. Hunt.*—A chain either passed through holes in a bar and secured with collars or pins, or fitted with bolts and nuts or screwed hooks, fastens the bar to the upright; another chain is passed around the ledger which rests on the bars, and around the standard and braces. Hooks having right and left-hand screws are fitted on to the chain ends, and a cylindrical nut, between collars bolted to the bar, serves to tighten the chain, a rod or lever being applied in radial holes of the nut.

11,916.—A PIPE-WRENCH: *A. J. Sawin.*—In the head of the handle are two lugs, through which are inserted pins upon which the lower jaw and the upper hooked jaw are pivoted. Pivoted links connect the jaws, which under normal conditions are forced together by a spring that is held by the upper pin, and bears against the upper jaw and a pin through the connecting links. The wear is taken by a tapered bar of angle-section (which may be turned so as to give a fresh edge) affixed at the working end of the lower jaw.

11,983.—APPARATUS FOR EXTINGUISHING FIRE: *G. H. Downing.*—A perforated tube is secured within the main casing of the extincteur by a neck at the top and a socket at the bottom. A screw-down cap holds the acid bottle in the top of the tube; in operation a weight falls to break the bottle when the case is inverted, the mixed liquids being thereupon discharged through the outlet.

11,987.—AN ARTIFICIAL STONE: *M. Cordes.*—An admixture is made of gypsum, one part, peat rubble one part, tan one part, and water four parts. The moulded blocks are stated to be particularly adapted for dividing-walls or light partitions.

11,995.—AN APPLIANCE FOR VENTILATORS: *P. Sonsalla.*—The inventor's object is to ensure that the door of the ventilator shall be quite shut. With the closing of the door around its pivot a roller is forced into a notch in the ring by means of a spring that is disposed so as to press upon the spindle of the roller. On the frame of the door is a plate that will sustain the ring centrically in its proper place.

12,038.—A SELF-SHUTTING VALVE: *A. E. F. Hansen.*—On to the inlet pipe is fitted a valve-casing, of which the upper end provides a seating for the valve. Winged guides are fashioned upon the spindle, whereof the lower end works through a guide in the outlet fitted over the lower end of the casing. A claw upon the movable handle is set in engagement with a rim upon the casing, whilst its forked lower arms embrace the outlet, and will work against a rim at the upper end of the outlet. The outlet rises for the opening of the valve as the handle is forced downwards.

12,074.—AN ELECTROMETRICAL APPLIANCE: *Siemens & Halske, A. G.*—In the case of an electrostatical volt-meter the inventors dispose the charged surfaces in such a manner that air will be compressed between them for damping their movement towards one another; they mount an aluminium body with wires upon an axle on which are a pointer and a balancing-weight, and which a spring will control and connect electrically. The other charged surface consists of a stationary curved box made of some insulating material thinly coated with metal, into which the aluminium body is attracted, and which it almost exactly fits.

12,106.—A TROLLEY FOR CONTRACTORS' USE: *P. G. Hossfeld.*—A two-wheeled trolley is devised for raising and transporting girders, baulks of timber, and so on. Rollers upon the crooked end of the handle are forced beneath the load; the other end of the handle or beam is pressed downwards, and the trolley is then pushed forward until the load rests upon the carrying-rollers. In another form the inventor provides arms, chains, and scissor-like levers which grip a beam or baulk of timber. The contrivance may be adapted to a four-wheeled waggon.

12,116.—MEANS OF ATTACHING CIRCULAR SAWS: *C. H. Clifton.*—A disc or flange having a projection that will fit in the middle hole of the saw is rivetted on to the saw, which is then clamped on to its spindle. Bolts may be inserted through the collar of the spindle and through the flange, their heads being countersunk into the saw.

12,132.—PROCESS OF MOULDING BRICKS: *J. G. Lowood, W. J. Gardner, and J. W. Armstrong.*—A screw inside a hopper feeds the material to the moulds, and after their tops have been dusted by the dusting-boxes the bricks are pressed and marked with fixed stamps worked by cams, levers, and rams, provision being made for the reciprocation of the mould-slides and the movement of the shuttles or slides of the dusting-boxes. A cam upon the driving-shaft operates a set of levers which intermittently reciprocate the cross-head on which are mounted the claws that lift the mould-box from the pressed bricks. A slide that supplies fresh mould-plates to the empty mould-box then forces the moulded bricks up inclines on to a side table. A container for the mould-plates is disposed above the slide and two sets of pivoted supports or arms, having different lengths, liberate the mould-plates singly; each plate drops from the long arms on to the short arms and thence on to the carrier-slide which a cam and lever reciprocate. The arms are set in pairs upon the opposite sides of cams which drive them apart so as to liberate the plates.

12,133.—SAWS FOR STONE: *J. Peckover.*—The saws consist of metal plates which are slotted so as to form the teeth; the outer slots are overlapped by the inner slots in order that they shall serve for teeth when the former set have been worn away; a clamp is employed for curving the teeth in turn towards opposite sides.

12,160.—FILAMENTS FOR INCANDESCENT LAMPS: *V. Thomas.*—These are composed of carbon or graphite and a refractory oxide, a mixture being made of nitro-cellulose, fifteen parts, dissolved in eighty-five parts of glacial acetic acid, with either 2 per cent. of thorium or beryllium acetate, or 1 per cent. each of thorium and aluminium acetates, or ·2 per cent. of cerium acetate. The salts should be added in aqueous solution, and nitrates may replace acetates.

12,182.—PROCESS OF SLAKING LIME: *W. Schullhess.*—A certain quantity of water is sprinkled over the lime, which is laid upon a screen carried by rollers in the interior of a hopper, the lid is closed, and the screen is reciprocated; the powder which has dropped below is treated in a horizontal cylinder, of which the external jacket is heated by steam to 97 deg. C., and a conveyer, which is rotated in the lower half of the cylinder, agitates the lime and discharges it through a steam-heated pivoted outlet door. As soon as the cylinder is hot enough a catch is drawn for the admission of the charge through a non-conducting or steam-heated valve at the base of the hopper.

12,186.—APPARATUS FOR USE WITH SEWAGE TANKS, FILTERS, &C.: *S. H. Adams.*—For the automatical filling and emptying of the tank, the sewage is caused to flow from a tank through a pipe into a chamber and thence upon a filter by the operation of a siphon, which in some instances is placed within the tank. A siphon adjusted to the filter, and an air-bell inside a chamber and in communication with a pipe attached to the discharge siphon, will regulate the amount of the flow of the sewage, and the action of the latter is arrested as the chamber is filled by the auxiliary siphon, the air in the bell being impelled through the pipe into the other siphon. In a variant shape the inventor connects an air-bell to a lever which regulates a valve upon the discharge-pipe of the tank.

12,258.—MEANS OF ESCAPE FROM FIRE: *F. M. Lepore.*—Around an overhead drum is passed an endless wire-rope ladder, of which the free end is allowed to hang through a window or other opening, the ladder being kept clear from the wall by guide pulleys. In use, the free end of the ladder is pulled downwards so as to unfasten the catch of the trap-door of the case in which the ladder is housed, and the speed of the descent can be controlled with a brake rope and a brake strap.

MEETINGS.

FRIDAY, NOVEMBER 1.

Architectural Association.—Mr. A. Wood, M.A., F.S.A., on "Cambridge in Early and Mediæval Times." 7.30 p.m.

Institution of Junior Engineers.—Presidential address by Sir John Jackson, F.R.S.E., Westminster Palace Hotel. 8 p.m.

Institution of Mechanical Engineers.—Adjourned discussion on the Second Gas Engine Research Report. 8 p.m.

SATURDAY, NOVEMBER 2.

British Institute of Certified Carpenters.—Adjourned discussion on Mr. Sweett's paper on "Modern Joinery." 6 p.m.

Dundee Institute of Architecture, Science, and Art—Professor Patrick Geddes, on "The Glasgow Exhibition: its Results and Lessons." Technical Institute, Small's Wynd, Dundee. 7 p.m.

MONDAY, NOVEMBER 4.

Institute of Architects.—President's Opening Address. 8 p.m.

Society of Engineers.—Mr. R. Gaskell Hetherington, M.A., on "The Main Drainage of Ilford." 17, Victoria-street. 7.30 p.m.

Liverpool Architectural Society.—Mr. W. F. Irvine on "The Ancient Streets and Boundaries of Liverpool." 41, Castle-street, Liverpool. 6 p.m.

TUESDAY, NOVEMBER 5.

Institution of Civil Engineers.—President's Address, and presentation of medals and prizes. Great George-street. 8 p.m.

WEDNESDAY, NOVEMBER 6.

Royal Archæological Institute of Great Britain and Ireland.—Mr. C. A. Bradford, F.S.A., "On a Vesica Piscis Window of Unusual Character at Millom Church." Mr. R. L. Hobson on "Mediæval Pottery found in England." 20, Hanover-square. 4 p.m.

Provident Institution of Builders' Foremen and Clerks of Works.—Ordinary meeting. 9, Conduit-street, W. 8 p.m.

THURSDAY, NOVEMBER 7.

Carpenters' Hall.—Mr. James Bartlett on "Setting O Work and By-laws." 7.30 p.m.

FRIDAY, NOVEMBER 8.

Architectural Association, Discussion Section.—Mr. W. E. Davis on "The Finishing of a Dwelling-house." 7.30 p.m.

The Technical College Architectural Craftsmen's Society.—Mr. Robert Stuart on "Soft Wood," and Mr. D. S. Pringle on "Hard Wood," 204, George-street, Glasgow. 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

October 14.—By W. G. BURGESS (at Swanley Junction).

Hextable, Kent.—The Nutley Nursery, 3 a., f. ..	£300
Dartford, Kent.—1 to 17, Orchard-st., u.t. 75 yrs, g.r. 10*l.*	850
Swanley Junction, Kent.—High-st., two plots of land, f.	360
Castle-rd., two plots of land, f.	150
1 to 16, Alexandra-ter., u.t. 63 yrs., g.r. 35*l.*	490
1 to 24, Castle-rd., u.t. 65 yrs., g.r. 60*l.* ..	680
1 to 11, Jessamine-ter., u.t. 81 yrs., g r. 24*l.*	1,120

October 16.—By W. R. NICHOLAS & Co. (at Swindon).

Braydon, Wilts.—Nine plots of building land, 3 a. 2 r. 10 p., f.	428

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Nine enclosures of land, 50 a. 2 r. 27 p., f. £1,258
October 17.—By Edwin J. Gilders (at Brightlingsea).
Brightlingsea, Essex.—The Bell Field, 11 a. 0 r. 28 p., f. 360
Sea View House and three cottages, f. 295
Walnut Tree Cottages and a block of land, f. .. 275
Sea View-rd., ten plots of building land, f. 300
By S. and G. Kingston (at Holbeach).
Moulton, Lincs.—Enclosures of land, 23 a. 0 r. 27 p., f. 1,570
Gedney, Lincs.—Enclosures of land, 10 a. 3 r. 19 p., f. 640
October 18.—By G. T. Nicholl (at Cardiff).
Llansannor, Glamorgan.—Garwa Farm, 103 a. 0 r. 32 p., f. 2,710
Llanilid, Glamorgan.—Hen Dafarn and 2 a. 2 r. 14 p., f. 360
Ruthin Farm, 29 a. 3 r. 20 p., f. 1,700
By Vincent S. Leigh.
Homerton.—77, Glyn-rd., u.t. 74 yrs., g.r. 2*l.* 15s., r. 40*l.* 525
40 to 54 (even), Glyn-rd., u.t. 75 yrs., g.r. 30*l.*.. 78 and 80, Coopersale-rd., u.t. 79 yrs., g.r. 3*l.* 10s. 2,380
By Edward Wood.
Hackney.—24, Groombridge-rd., u.t. 52 yrs., g.r. 6*l.*, r. 36*l.* 675
Dulwich.—39, Barry-rd., u.t. 71½ yrs., g.r. 8*l.*, e.r. 40*l.* 375
Fulham.—31, Seagrave-rd., u.t. 63½ yrs., g.r. 11*l.*, e.r. 55*l.* 295
October 19.—By Evans & Evans (at Stafford).
Stafford.—Wolverhampton-rd., freehold stable, yard, and 4 a. 1 r. 34 p. 460
Rowley Bank House and 1 a. 2 r. 28 p., f. 2,000
Whitgreave, Staffs.—Summer Hill Farm, 141 a. 0 r. 33 p., f. 1,700
Sleighford, Staffs.—Moor Barn Farm, 40 a. 2 r. 30 p., f. 4,000
By Hampton & Sons (at Wimbledon).
Wimbledon.—Marryat-rd., eight freehold building sites 1,400
Burghley-rd., a freehold building site 3,333
Parkside-av., a corner building site 420
October 21.—By Chetwynd, Lloyd, & Deane.
Finsbury Park.—40 and 42, Gillespie-rd., u.t. 44½ yrs., g.r. 16*l.*, r. 68*l.* 750
Hackney.—346 and 348, Hackney-rd., u.t. 41 yrs., g.r. 24*l.*, r. 125*l.* 575
By G. Head & Co.
Marylebone.—21 and 23, Huntsworth-mews, u.t. 19 yrs., g.r. 10*l.* 16s. 1,070
By Levens, Son, & Hoare.
Abbey Wood, Kent.—Woolwich-rd., Dar-el-Saleem and 3 acres, f. 310
By Messrs. Rutter.
Boxmoor, Herts.—Bennett's End, a freehold cottage and 20 a. 1 r. 20 p. 2,600
By Wyer, Adams, & Glover.
Stockwell.—Sydney-rd., the Grosvenor Arms p.-h., f.g.r. 35*l.*, reversion in 35½ yrs. 680
October 22.—By Bisley & Sons.
Rotherhithe.—21, Gomm-rd., u.t. 50½ yrs., g.r. 4*l.* 1,570
Lee.—17, Burnt Ash Hill, u.t. 74 yrs., g.r. 10*l.*, r. 70*l.* 380
By C. H. Brown.
Pimlico.—63, Hanover-st., u.t. 23 yrs., g.r. 7*l.*, e.r. 52*l.* 825
76, Hanover-st., u.t. 23 yrs., g.r. 8*l.*, r. 45*l.* 340
Forest Hill.—1, Imperial-buildings, f., r. 85*l.* 350
By David Burnett & Co.
Tottenham.—Dartford-ter., f.g.r.'s 47*l.*, reversion in 99 yrs. 1,500
By Debenham, Tewson, & Co.
City of London.—6, Wormwood-st., area 580 ft., f., r. 150*l.* 1,165
Southwark.—42 to 50 (even), Falmouth-rd., u.t. 21 yrs., g.r. nil, r. 156*l.* 3,810
Hayes, Middlesex.—London-rd., Holly Lodge and ¾ a., f. 1,340
By Furber, Price, & Furber.
Dulwich.—35 to 45 (odd), East Dulwich-grove, f., r. 185*l.* 1,000
By J. S. Richardson.
Pimlico.—25, Lillington-st., u.t. 22 yrs., g.r. 5*l.* 5s., e.r. 60*l.* 2,800
By Humbert & Flint.
Watford, Herts.—79, Sotheron-rd., f. 415
The Parade (rear of), freehold cottage and stabling 210
17, Vicarage-rd., f., r. 35*l.* 450
Bushey, Herts.—Merry Hill Mount, a p'ot of land, f. 500
Victoria-rd., two plots of building land, f. 28
October 23.—By Brackett & Sons.
Battersea.—4, Soudan-rd., u.t. 82½ yrs., g.r. 7*l.*, r. 35*l.* 51
By Mark Lidell & Son.
Stratford.—29 to 35 (odd), Dunmow-rd., u.t. 74 yrs., g.r. 10*l.* 375
11 and 13, Manbey-grove, f., r. 56*l.* 775
4 to 12, 18 to 24 (even), Waddington-st., u.t. 72 yrs., g.r. 16*l.* 16s. 8d. 950
Forest Gate.—110, Forest-lane, f., r. 40*l.* 1,840
Wellington-rd., f.g.r. 7*l.*, reversion in 55 yrs. .. 108, Osborne-rd., u.t. 75 yrs., g.r. 7*l.* 19s., e.r. 35*l.* 560
Hackney.—4, 6, 8, and 10, Annis-rd., u.t. 43 yrs., g.r. 16*l.*, r. 110*l.* 180
29 and 31, Annis-rd., u.t. 43 yrs., g.r. 9*l.*, r. 56*l.* 410
111, Cassland-rd., u.t. 37 yrs., g.r. 3*l.* 10s. 1,035
10, Edenbridge-rd., u.t. 52 yrs., g.r. 6*l.*, r. 32*l.*.. Poplar.—142, High-st., f., r. 75*l.* 550
Brixton.—4, Kellett-rd., u.t. 71½ yrs., g.r. 6*l.* 15s. 215
Bow.—106, Coborn-rd., u.t. 61 yrs., g.r. 4*l.* 10s., r. 30*l.* 355
Walthamstow.—41, Erskine-rd., f., e.r. 40*l.* 925
Upton Park.—130 and 132, Neville-rd., f., r. 78*l.* 435
Leytonstone.—Fillebrook-rd., Wannock, f., r. 36*l.* 315
By Linnett & Lane.
Canning Town.—136 to 142 (even), Barking-rd., u.t. 62½ yrs., g.r. 32*l.*, r. 156*l.* 450
Ealing.—30 to 42 (even), Carlyle-rd., u.t. 95 yrs., g.r. 31*l.* 10s. 680
By Protheroe & Morris.
Rusper, Sussex.—The Rusper Valley Vineries, 4 a., f. 600
Woodford.—1 and 2, Vine Cottages, 1 a., u.t. 63 yrs., g.r. 20*l.* 1,620
1,650
780
85

Normandy, Surrey.—The Manor Nurseries, 41 a. 3 r. 11 p., f. £2,710
Enclosures of meadow land, 10 a. 3 r. 3 p., f. .. 450
Bow.—192, Bow-rd., f., r. 45*l.* 700
Bromley-by-Bow.—47 to 53 (odd), High-st., f., r. 75*l.* 1,175
By Tomlin & Co.
Forest Hill.—86 to 92 (even), Ewart-rd., u.t. 60 yrs., g.r. 16*l.* 630
By Victor Vaughan.
Finchley.—Great North-rd., Fallow Corner and 1 a. 3 r. 20 p., f. 2,520
Dalston.—Greenwood-rd., l.g.r. 67*l.* 15s., u.t. 50 yrs., g.r. nil 1,390
Norwood.—5, Cranfield-villas, u.t. 61 yrs., g.r. 4*l.* 4s., r. 26*l.* 200
By Wagstaff & Sons.
Barnsbury.—4 and 6, Cloudesley-sq., u.t. 42 yrs., g.r. 51*l.*, r. 115*l.* 535
By W. N. Willoughby.
Norwood.—7 and 8, Idmiston-rd., u.t. 81 yrs., p.r., &c., 16*l.* 4s., r. 105*l.* 1,110
By Balch & Balch (at Camden Town).
Kentish Town.—15 and 17, Leverton-st., u.t. 41 yrs., g.r. 11*l.*, r. 55*l.* 630
Holloway.—18 and 20, Poynings-rd., u.t. 68½ yrs., g.r. 14*l.*, r. 80*l.* 800
October 24.—By J. A. & W. Tharp.
Shoreditch.—5 to 16, Reliance-sq., area 5,578 ft., f., r. 280*l.* 3,250
Leytonstone.—33, 35, and 37, Chester-st., and two building sites adjoining, f. 825
By C. C. & T. Moore.
St. George's East.—Cable-st., f.g.r. 10*l.*, reversion in 19½ yrs. 450
111 and 113, Cable-st., f., r. 56*l.* 1,100
107 and 109, Cable-st., and 116, Grove-st., f. .. Spitalfields.—37, Fournier-st., f., r. 78*l.* 1,100
71, Commercial-st., f., r. 50*l.* 1,325
Stepney.—Ben Jonson-rd., St. Thomas'-yard, area 19,240 ft., f., e.r. 850*l.* 1,200
Bromley-by-Bow.—6, 8, 10, and 12, Gale-st., u.t. 54½ yrs., g.r. 12*l.* 1,560
Anerley.—Station-rd., f.g.r. 10*l.*, reversion in 62 yrs. 5,500
Canning Town.—53, 55, and 57, Hartington-rd., f., r. 52*l.* 650
Poplar.—118 and 120, Kerbey-st., f. 300
122 and 124, Kerbey-st., u.t. 34 yrs., g.r. 5*l.* 10s. 115, 117, and 117a, Chrisp-st., and 30, 32, and 34, Carmen-st., u.t. 30 yrs., g.r. 12*l.* 10s. 525
51 to 65 (odd), Willis-st., u.t. 40½ yrs., g.r. 24*l.*.. By Newton, Edwards, & Shephard.
Battersea.—325 and 327, Battersea Pk.-rd., u.t. 60 yrs., g.r. 9*l.*, r. 115*l.* 575
1, Lancaseer-st., u.t. 61 yrs., g.r. 6*l.*, r. 39*l.* 1,420
Pimlico.—4, Rutland-ter., u.t. 23 yrs., g.r. 7*l.*, r. 48*l.* 1,100
11, Pulford-st., u.t. 14 yrs., g.r. 3*l.* 9s., r. 31*l.* 10s. 305
Chiswick.—489, High-rd., u.t. 60 yrs., g.r. 5*l.* 14s., e.r. 50*l.* 275
Acton.—8 and 11, The Parade, u.t. 75½ yrs., g.r. 22*l.* 135
Leyton.—Crescent-rd., i.g.r. 7*l.* 10s., u.t. 69 yrs., g.r. nil 480
Holloway.—7, Stock Orchard-cres., u.t. 40½ yrs., g.r. 8*l.*, r. 48*l.* 570
2, Drayton Pk., u.t. 32½ yrs., g.r. 8*l.*, r. 50*l.* 130
Islington.—15, 16 and 21, Hardinge-st., u.t. 29½ yrs., g.r., 18*l.* r. 114*l.* 415
Canonbury.—30, Compton-rd., u.t. 43½ yrs., g.r. 4*l.* 850
Kentish Town.—51, Patshull-rd., u.t. 59½ yrs., g.r. 3*l.* 15s., e.r. 65*l.* 490
170, Kentish Town-rd., a profit rental of 30*l.* for 10½ yrs. 720
Victoria Park.—14, Victoria-rd., u.t. 61 yrs., g.r. 5*l.*, r. 45*l.* 230
Hoxton.—43 to 51 (odd), Mintern-st., u.t. 29 yrs., g.r. 21*l.*, r. 177*l.* 495
By Stimson & Sons.
Bethnal Green.—56, Parmiter-st., u.t. 34 yrs., g.r. 3*l.* 3s., e.r. 35*l.* 1,555
Leytonstone.—Lancaster-rd., a plot of building land, f. 300
Balham.—12, The Lawn, u.t. 33½ yrs., g.r. nil, r. 40*l.* 80
Camberwell.—73 and 74, Grove-pk., u.t. 86 yrs., g.r. 10*l.*, r. 96*l.* 420
83, Grove-pk., u.t. 86 yrs., g.r. 5*l.*, r. 48*l.* 1,110
Wandsworth.—16, Cromford-rd., u.t. 82 yrs., g.r. 6*l.* 10s., r. 35*l.* 570
Camberwell.—5, Selborne-rd., u.t. 61 yrs., g.r. 5*l.* 10s., r. 30*l.* 400
Kennington.—7, 9, and 11, Smith-st., f. 360
5 to 9, Ivan's-pl., u.t. 52 yrs., g.r. 16*l.* 930
Hampton & Sons.
Westminster.—32, Queen Anne's Gate, f. subject to garden rent of 6*l.* 17s. 50
By Worsfold & Hayward (at Dover).
Dover, Kent.—2, Avenue-rd., f., r. 19*l.* 10s. 13,750
1 to 4, Claremont Cottages, f. 300
19, Adrian-st., f. 645
2 and 3, Durham Hill, u.t. 21½ yrs., g.r. 3*l.* 12s. 155
By Edwin Evans (at Clapham Junction). 200
Battersea.—6, Thibet-st., u.t. 58½ yrs., g.r. 12*l.* 15s. 82
9, Heaver-rd., u.t. 76½ yrs., g.r. 5*l.* 243
52, Mantua-st., u.t. 93½ yrs., g.r. 5*l.* 250
163, Harbut-rd., u.t. 77 yrs., g.r. 6*l.* 10s. 253
Wandsworth.—63 to 69 (odd), North-st., u.t. 85 yrs., g.r. 22*l.* 1,275
20, Honeywell-rd., u.t. 78 yrs., g.r. 8*l.* 9s., r. 40*l.* 420
15 and 17, Groton-rd., f. 420
Clapham.—19, Marjorie-grove, u.t. 93 yrs., g.r. 7*l.* 15s., r. 46*l.* 365
13, Alderbrook-rd., u.t. 75 yrs., g.r. 8*l.*, e.r. 52*l.* 490
9, Leathwaite-rd., u.t. 80 yrs., g.r. 15*l.*, r. 58*l.* .. 530
Streatham.—1, Guildown-ter., u.t. 96 yrs., g.r. 7*l.* 7s., r. 52*l.* 350
Putney.—34, Schubert-rd., u.t. 81 yrs., g.r. 8*l.* 8s., e.r. 45*l.* 335

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leaschold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

**** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 12 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 10 0	"	" "
Facing Stocks	2 12 0	"	" "
Shippers	2 8 0	"	" "
Flettons	1 8 0	"	at railway depôt.
Red Wire Cuts	1 14 6	"	" "
Best Fareham Red	3 11 0	"	" "
Best Red pressed Ruabon Facing.	5 5 0	"	" "
Best Blue Pressed Staffordshire	4 6 6	"	" "
Do., Bullnose	4 10 0	"	" "
Best Stourbridge Fire Bricks	4 4 0	"	" "
Glazed Bricks			
Best White and Ivory Glazed Stretchers	13 0 0	"	" "
Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats	17 0 0	"	" "
Double Stretchers	19 0 0	"	" "
Double Headers	16 0 0	"	" "
One Side and two Ends	19 0 0	"	" "
Two Sides and one End	20 0 0	"	" "
Splays, Chamfered, Squints	20 0 0	"	" "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats	14 0 0	"	" "
Double Stretchers	15 0 0	"	" "
Double Headers	14 0 0	"	" "
One Side and two Ends	15 0 0	"	" "
Two Sides and one End	15 0 0	"	" "
Splays, Chamfered, Squints	14 0 0	"	" "
Seconds Quality White and Dipped Salt Glazed	2 0 0	"	less than best.

	s. d.		
Thames and Pit Sand	7 3	per yard, delivered.	
Thames Ballast	6 0	"	"
Best Portland Cement	32 0	per ton, delivered.	
Best Ground Blue Lias Lime	25 6	"	"

Note.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered
Stourbridge Fire-clay in sacks, 28s. od.		per ton at rly. dpt

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.	
Bath "	1 7	"	"
Farleigh Down Bath	1 8	"	"
Beer in blocks	1 6½	"	"
Grinshill "	1 10	"	"
Brown Portland in blocks	2 2	"	"
Darley Dale in blocks	2 1½	"	"
Red Corsehill "	2 5	"	"
Red Mansfield "	2 4½	"	"
Hard York in blocks	2 10	"	"
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	s. d. 0 8	per ft. super at rly. depôt	
" " 6 in. Rubbed Ditto	3 0	"	"
" " 3 in. sawn both sides slabs (random sizes)	1 3	"	"
" " 2 in. self-faced Ditto	0 9½	"	"
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt	
" " " 6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.	
" " " 3-in. do.	1 2½	"	"

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.	
" best seconds "	10 15 0	"	"
16×8 best "	6 2 6	"	"
20×10 best blue Portmadoc	10 18 0	"	"
16×8 best blue Portmadoc	6 0 0	"	"
20×10 best Eureka unfading green	11 2 6	"	"
16×8 " "	6 15 0	"	"
20×10 Permanent green	10 0 0	"	"
16×8 " "	5 12 6	"	"

TILES.

	s. d.		
Best plain red roofing tiles	42 6	per 1,000 at rly. depôt	
Hip and valley tiles	3 7	per doz.	" "
Best Broseley tiles	48 6	per 1,000	" "
Hip and valley tiles	4 0	per doz.	" "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	" "
Do. ornamental Do.	60 0	"	" "
Hip tiles	4 0	per doz.	" "
Valley tiles	3 9	"	" "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	" "
Hip tiles	4 1	per doz.	" "
Valley tiles	3 8	"	" "

WOOD.

Building Wood.—Yellow.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.

[*See also page 397.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
Union and Relief Offices	Barnsley Guardians	20*l.*	Nov. 22
*Designs for Cathedral, Liverpool	The Committee	300 guineas each Selected Architect	June 30
*New Public Library	Kingston-on-Thames Corporation	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Additions to Workhouse	Newton Abbot (Devon) Guardians	S. Segar, Architect, Union-street, Newton Abbot	Nov. 5
Reservoir, Radcliffe, near Manchester	East Lancs. Paper Mill Co., Ltd.	J. Sellers & Son, Surveyors, Union Chambers, Bury	do.
Sewerage Works, Radcliffe-on-Trent	Bingham R.D.C.	W. H. Radford, Civil Engineer, King-street, Nottingham	do.
Sewers, &c., Lichfield-street	Walsall Corporation	Borough Surveyor, Town Hall, Walsall	do.
Offices, &c., King Edward-street, Hull	L. & Y. Railway Company	R. C. Irwin, Hunt's Bank, Manchester	do.
Paving Works, South-place	Windsor Town Council	Borough Surveyor, Alma-place, Windsor	do.
Street Works, Edleston-road	Crewe Town Council	G. Eaton-Shore, Borough Surveyor, Earle-street, Crewe	do.
Stabling, &c., Havelock-st., Great Horton, nr. Bradford		S. Spencer, Architect, 344, Great Horton-road, Bradford	do.
Sewage Tanks	Linlithgow Town Council	Warren & Stuart Civil Engineers, 94, Hope-street, Glasgow	do.
House, &c.	Kilkenny Corporation	P. O'Grady, Corporation Offices, Kilkenny	do.
Restoration of Parish Church, Axminster		E. H. Harbottle, Architect, County Chambers, Exeter	do.
Sewerage Works	Leicester Corporation	E. G. Mawbey, Civil Engineer, Town Hall, Leicester	do.
Cement, &c.	Sligo Corporation	Borough Surveyor, Town Hall, Sligo	Nov. 6
Station Buildings	Glasgow & Renfrew D. R. Co.	Wharrie & Colledge, Engineers, 109, Bath-street, Glasgow	do.
Renovation at Wesleyan Chapel, Portreath, Cornwall		S. Hill, Architect, Redruth	do.
Church and School, Whitby	Primitive Methodist Connexion	W. G. Smithson, Architect, 13, Bond-street, Leeds	do.
Electricity Sub-Station, Bennett-street	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
Electricity Sub-Station, The Polygon, Ardwick	do.	do.	do.
Bricks, &c., Burwell	Newmarket U.D.C.	J. W. Metcalf, Surveyor, Town Hall, Newmarket	Nov. 7
Cast-iron Pipes, &c.	Blaydon-on-Tyne U.D.C.	G. Symon, Surveyor, Blaydon	do.
Cottage, Crofts, Rothes, N.B.		J. Smith, Estate Office, Elgin	do.
Sewerage Works	Blaydon U.D.C.	G. Symon, Surveyor, Council Offices, Blaydon	do.
Two Blocks of Houses, Mount-street, Batley Carr	Co-operative Society, Limited	H. B. Buckley, Architect, 85, Commercial-street, Batley	Nov. 8
Six Houses, Victoria-avenue, Glebe Estate, Hunstanton		W. Wren, Surveyor, Cambridge	do.
Hospital, Coulsborough, Yorks	Doncaster, &c., Joint Hospital Bd.	J. H. Morton, Architect, 50, King-street, South Shields	do.
Halls, Library, &c., Kingston	Glasgow Corporation	J. Lindsay, City Chambers, Glasgow	do.
Seven Houses, Rutland-street	Great Grimsby Co-op. Soc., Ltd.	A. Gooseman, Architect, 112, Cleethorpes-road, Grimsby	do.
Reservoir	Girvan (N.B.) Town Council	J. & H. V. Eaglesham, Civil Engineers, Wellington Chambers, Ayr	Nov. 9
Additions to Schools, near Bedale	Hunton (Yorks) School Board	T. F. King, Edgley, Leyburn	do.
Two Houses, Hatfield-road	Bradford Corporation	F. E. P. Edwards, Architect, Chapel-lane, Bradford	do.
Road Works, Gipsy-road	Willenhall (Staffs) U.D.C.	T. E. Fellows, Civil Engineer, Town Hall, Willenhall	Nov. 11
Schools, Whitefield	Nelson (Lancs) School Board	T. Bell, Architect, Grimshawe-street, Burnley	do.
Car Sheds, Shops, &c.	Bournemouth Town Council	F. W. Lacey, Civil Engineer, Town Hall, Bournemouth	do.
Additions to Stotfield Hotel, Lossiemouth		R. B. Pratt, Architect, Elgin	do.
*Electricity Works	Mansfield Town Council	Vallance & Westwick, Architects, Mansfield	do.
*Norway Granite Kerb and Channel	Broadstairs & St. Peter's U.D.C.	H. Hurd, Town Surveyor, Broadstairs	do.
Additions to Workhouse	Dover Guardians	Cresswell & Newman, Architects, Castle-street, Dover	Nov. 12
Bridge Works, Newtown Goods Yard, Cardiff	Great Western Railway Company	G. K. Mills, Paddington Station, London	do.
Water Supply Works	Rothwell (Northants) U.D.C.	W. T. Pearson, Surveyor, Bank Chambers, Rothwell	do.
Additions to Schools, Laira Green	Plymouth School Board	H. J. Snell, Architect, 11, The Crescent, Plymouth	do.
Sewerage Works	Bedlingtonshire U.D.C.	C. D. Forster, 24, Grainger-street W., Newcastle-on-Tyne	do.
Shop, &c., Cleator Moor	Co-operative Society, Limited	Secretary, Co-operative Society's Central Offices, Cleator Moor	do.
Granite Setts (5,000 tons)	Walsall Corporation	Borough Surveyor, Bridge-street, Walsall	do.
*Bakehouse at Workhouse	Wandsworth and Clapham Union	W. C. Poole, Architect, Prested-road, Clapham Junction, S.W.	Nov. 13
*Additional Buildings at Pumping Station	Deal & Walmer Joint Water Board	H. & C. Hawksley, 30, Great George-street, S.W.	do.
*Six Houses, Lewes	Lewes Co-op. Society, Limited	T. W. Franks, Architect, Lewes	do.
*Wood Paving, &c., Works	Fulham Council	Borough Surveyor, Town Hall, Fulham	do.
*Branch Library	do.	do.	do.
*Furnishing and Seating Church, Bryn	G. Lipscomb, Esq.	F. B. Smith, Architect, Port Talbot	Nov. 14
Water Supply Works	Manorhamilton (Ireland) R.D.C.	P. Keany, District Council Offices, Manorhamilton	do.
*Steam Roller	Woolwich Council	Borough Engineer, Maxey-road, Plumstead	do.
Engine House, &c., Park-street	Leeds Corporation	P. Robinson, Architect, 72, Albion-street, Leeds	Nov. 18
*Workmen's Houses	Heston & Isleworth U.D.C.	P. G. Parkman, Engineer, Town Hall, Hounslow	do.
*Jobbing Works (three years)	Corporation of London	Engineer's Office, Guildhall, E.C.	Nov. 19
*Pipe Sewer	do.	do.	do.
*Isolation Hospital	Chiswick U.D.C.	Surveyor to Council, Town Hall, Chiswick	Nov. 20
*Enlargement, Post Office, Darlington	Commissioners of H.M. Works, &c	H.M. Office of Works, Storey's Gate, S.W.	do.
*New Wing to Herbarium, Kew Gardens	do.	do.	do.
House, &c., Newbridge, near Ruabon		W. H. Jones, Architect, Llangollen	Nov. 22
Free Library, Nineveh-street	Leeds Corporation	W. Bakewell, Architect, 38, Park-square, Leeds	Nov. 23
Schools, Askham-in-Furness		Rev. W. Carr, Slater-terrace, Dalton-in-Furness	Nov. 28
*New Coastguard Buildings, Northumberland	Admiralty	District Clerk of Works, 21, Bootham-terrace, York	Nov. 29
Assembly Buildings, Fisherwick-place, Belfast	The Committee	Young & Mackenzie, Architects, Belfast	Dec. 2
*New Dock	Hull Joint Dock Committee	Sir John Wolfe Barry, 21, Delahay-street, Westminster	Dec. 6
Store Premises at Docks, Grimsby		G. W. Parker, Fish Dock-road, Grimsby	No date
Drain Pipes, &c., Tyburn, near Birmingham	Mr. Ingram	J. D. Watson, Engineer, Tyburn, near Birmingham	do.
House, Llanwrtyd Wells, N. Wales		H. Teather, Architect, Shrewsbury	do.
Schools, Five Lanes End, Ropley, Hants		Colson & Co., Architects, 45, Jewry-street, Winchester	do.
House, Station-road, Steeton, Yorks		Moore & Crabtree, Architects, York Chambers, Keighley	do.
Kerbs, Setts, &c.	Farnborough U.D.C.	J. E. Hargreaves, Surveyor, Town Hall, Farnborough	do.
House, Shop, &c., Cudworth, Yorks		G. Moxon, Architect, Barnsley	do.
Theatre, George-street, Hull		T. Guest, Architect, Cobden Buildings, Birmingham	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Building and Drainage Inspector	Twickenham U.D.C.	2*l.* 10*s.* per week	Nov. 16

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xviii. & xxii.*

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PRICES CURRENT (*Continued*).

WOOD.

	£ s. d.	£ s. d.
	At per standard.	
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
	At per load of 50 ft.	
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 18 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 0 0	3 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	18 0 0	20 0 0
Second yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
,, ,, 3 in. by 9 in.	18 0 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 10 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Do. 3 in. by 9 in.	19 0 0	20 0 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	15 10 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	15 0 0
Battens	11 10 0	12 0 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	13 10 0
Battens	10 10 0	11 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 0 0	16 0 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 0 0	13 0 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	10 10 0	11 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	. . .
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per Square	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 14 0	0 16 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 15 0	7 15 0
Compound Girders ,, ,,	8 15 0	10 0 0
Angles, Tees and Channels, ordinary sections	8 12 6	10 12 6
Fliteh Plates	8 15 0	9 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 5 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	. . .
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	. . .
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	. . .
,, ,, to 24 g.	11 0 0	. . .
,, ,, to 26 g.	12 10 0	. . .
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	. . .
,, ,, 22 g. and 24 g.	13 0 0	. . .
,, ,, 26 g.	14 0 0	. . .
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	. . .
,, ,, 22 g. and 24 g.	17 0 0	. . .
,, ,, 26 g.	18 10 0	. . .
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	. . .
,, ,, 22 g. and 24 g.	13 0 0	. . .
,, ,, 26 g.	14 0 0	. . .

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	. . .
,, ,, 22 g. and 24 g.	13 5 0	. . .
,, ,, 26 g.	14 5 0	. . .
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0
LEAD, &c.	Per ton, in London. £ s. d.	£ s. d
LEAD—Sheet, English, 3 lbs. & up.	14 10 0	. . .
Pipe in coils	15 0 0	. . .
Soil Pipe	17 10 0	. . .
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	. . .
Silesian	24 0 0	. . .
COPPER—		
Strong Sheet per lb.	0 1 0½	. . .
Thin ,,	0 1 2	. . .
Copper nails ,,	0 1 2	. . .
BRASS—		
Strong Sheet ,,	0 0 11	. . .
Thin ,, ,,	0 1 1	. . .
TIN—English Ingots ,,	0 1 3½	. . .
SOLDER—Plumbers' ,,	0 0 6½	. . .
Tinmen's ,,	0 0 8	. . .
Blowpipe ,,	0 0 9	. . .

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d. per ft. delivered.	
,, ,, fourths	2¾d. ,,	,,
21 oz. thirds	3¾d. ,,	,,
,, ,, fourths	3½d. ,,	,,
26 oz. thirds	5d. ,,	,,
,, ,, fourths	4½d. ,,	,,
32 oz. thirds	6d. ,,	,,
,, ,, fourths	5½d. ,,	,,
Fluted sheet, 15 oz.	3½d. ,,	,,
,, ,, 21 oz.	4½d. ,,	,,
½ Hartley's Rolled Plate	2½d. ,,	,,
⅝ ,, ,, ,,	3¼d. ,,	,,
¾ ,, ,, ,,	3¾d. ,,	,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 9
,, ,, ,, in barrels ,,	0 2 10
,, ,, ,, in drums ,,	0 3 0
Boiled ,, ,, in pipes ,,	0 2 11
,, ,, ,, in barrels ,,	0 3 0
,, ,, ,, in drums ,,	0 3 2
Turpentine, in barrels ,,	0 2 3
,, in drums ,,	0 2 5
Genuine Ground English White Lead per ton	22 0 0
Red Lead, Dry ,,	22 10 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 10 0

VARNISHES, &c.

	per gallon. £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 18 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ANDOVER.—For the erection of fire-engine station, East-street. Mr. R. Walter Knapp, Borough Surveyor, Town Hall, Andover:—

S. Bell	£275	Beale & Sons, Andover*	£248

BARKING (Essex).—For the erection of entrance lodge, tool house, &c., Longbridge-road, for the District Council. Mr. C. F. Dawson, Surveyor, Public Offices, Barking:—

	Lodge. £	Tool House. £	Cart Sheds. £ s.	Total. £ s.
J. C. Garbett	830	255	130 0	1,215 0
Robey	803	247	79 10	1,194 10
S. Hind, Leytonstone*	672	236	90 0	998 0
Surveyor's estimate	800	244	85 0	1,129 0

BRAINTREE (Essex).—For the execution of building work at cemetery chapels, for the Urban District Council:—

Letch & Bowtell, Braintree	£255

CARNOUSTIE (N.B.).—For macadamising Maule-street, for the Provost, Magistrates, and Councillors. Mr. R. P. Fleming, Burgh Surveyor, Council Chambers, Carnoustie:—

C. Wilson, Carnoustie*	£284 14 4

COCKERMOUTH.—For the execution of sewerage works, Dovenby, for the Rural District Council. Mr. J. B. Wilson, C.E., Court-buildings, Cockermouth. Quantities by the engineer:—

J. Dawson	£491 0 0	James Watson, Oughterside*	£372 2 10
Jonathan Smithson	377 10 0		

[Engineer's estimate, £400.]

CROYDON.—For the erection of cottage homes, Shirley Lodge Farm, Woodside, for the Guardians of the St. Olave's Union. Messrs. Newman & Newman, architects, 31, Tooley-street, London Bridge, S.E.:—

Bulled & Co.	£160,000	Goddard	£138,500
Balaam Bros.	157,628	Holloway	134,000
Willcox & Co.	141,845	Patrick	129,900
Bowyer & Co.	141,810	C. Wall, Chelsea*	128,030
Colls & Sons	141,500	Saunders	123,164

EASTBOURNE.—For the erection of branch library buildings and baths at Seaside. Mr. W. Chapman Field, architect, Building Surveyor's Office, Eastbourne:—

Martin Wells & Co.	£2,450	M. Hookham	£2,248
Dennis & Co.	2 348	W. & E. Noakes	2,188
F. Rich	2,324		

HALE (Cheshire).—For the execution of sewerage works for the Urban District Council. Mr. F. J. Lobley, C.E., Ashley-road, Hale, Cheshire. Quantities by the engineer:—

J. Dale	£6,129 7 0	Naylor & Sons, Hulme, Manchester*	£4,180 0 0
G. Bozson	5,735 6 0	S. Johnson	4,084 9 6
Bennie & Thompson	5,481 14 0	Gosling & Stafford	3,643 2 6
Hamilton & Son	4,781 0 0	Pickthall & Son	3,195 8 0
Hawkins & Co.	4,383 3 8		
C. E. Carden	4,332 2 0		
H. Morecroft	4,292 0 0		

[Engineer's estimate, £4,200.]

HALE (Cheshire).—For the execution of surface water drainage works for the Urban District Council. Mr. F. J. Lobley, C.E., Hale, Cheshire:—

Hamilton & Son	£940 0 0	C. E. Carden	£735 11 3
H. Morecroft	915 0 0	Etheridge & Clark	732 10 0
T. J. Hawkins	898 8 0	G. Bozson	692 17 6
Naylor & Son	793 15 6	Snape & Sons	657 16 6
Gosling & Stafford	746 13 6	S. Hutton, Stamford-rd., Bowdon*	617 7 6

HANDSWORTH (Staffs).—For the erection of sewerage works, Booth-street and Crockett's-road, for the Urban District Council. Mr. H. Richardson, C.E., Council House, Handsworth, Staffs:—

Nicholls & Co.	£315 0 0	Currall, Lewis, & Martin	£218 8 0
J. Biggs	289 16 0	J. White, jun., Boulton-road, Handsworth*	207 14 6
G. Trentham	259 14 0		
J. Mackay	240 0 3		

HORBURY (Yorks).—For the execution of road works, Shepstye-road, &c., for the Urban District Council. Mr. C. R. Spencer, Engineer, Council Offices, High-street, Horbury:—

W. Jowett	£522 17 2	Coop & Son	£350 0 0
Matthew Hall	407 0 0	Wainwright & Sons, Northgate, Horbury*	312 15 0
S. & R. Dems	385 2 0		
G. Hampshire	367 0 0		
H. Hindle	365 0 0		

LONDON.—For the erection of stabling, Peckham, for Messrs. Gatti, Stevenson, & Slaters, Ltd. Mr. H. Phelps Drew, architect, 33, King-street, Covent Garden. Quantities by Mr. J. Rookwood, 25, Bedford-row, W.C.:—

Spencer, Santo, & Co.	£4,950	Carmichael	£4,736
Williams & Son	4,875	Edwards & Medway	4,707
Richards & Co.	4,840	Wilkinson Bros.	4,604
Higgs & Hill	4,824	F. G. Minter*	4,435

SALE (Cheshire).—For additions, &c., to technical school, for the Urban District Council. Mr. Wm. Holt, Engineer, Council Offices, Sale. Quantities by Engineer:—

T. Mawdsley, Granby-row, Manchester*	£862

SHEFFIELD.—For the erection of public baths and library, Duke-street Park, for the Corporation:—

Joinery and Carpentering.—C. Pottass, Broadfield Park-road, Sheffield*	£1,357 15 5
Slating.—C. Chadwick, Victoria-street, Sheffield*	700 0 0
Plastering.—C. Chadwick, Victoria-street, Sheffield*	215 0 0
Plumbing and Glazing.—H. Braithwaite & Co., Swinegate, Leeds*	430 15 5
Ironwork.—T. W. Ward, Fitzalan Chambers, Sheffield*	811 10 0

[*See also next page.*

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SUNDERLAND.—For alterations to the Foresters' Arms, Ryhope, for the trustees of the late Mr. Jos. Johnson. Mr. Henry Grieves, architect, Albany Chambers, South Shields :—

Taylor & Welford*	£247 18 6

WHEATLEY (Oxon).—For the construction of sewers, settling tanks, &c. Mr. Geo. Winship, engineer, 21, St. Michael-street, Oxford :—

A. & A. Streeter	£3,540 0	Johnson Bros.	£2,450 0
W. Lee & Son	2,777 10	G. R. Mann, Edgware*	2,141 8
H. Roberts	2,495 0	R. W. Swaker	2,050 0
McCarthy E. Fitt	2,475 0		

WREXHAM.—For the erection of house, warehouse, and stables, Rivulet-road, for Messrs. Thomas Hughes & Co. Mr. Fredk. B. James, architect, 1, Park-view, Holt-road, Wrexham :—

T. Jones	£1,819 0	Davies Brothers	£1,717 14
W. E. Samuel	1,780 0	W. Hughes*	1,660 0

[All of Wrexham.]

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders :—

ADDISON-GARDENS. — Enlargement, 414. Providing three new classrooms—fifty, forty-eight, forty, for each department ; new staircases for girls and boys ; additional cloakrooms for each department ; extending corridor on each floor ; and providing new entrance to main building for infants :—

Wall & Co.	£7,180 0 0	Simpson & Son	£6,450 0 0
General Builders, Ltd.	7,156 0 0	Stimpson & Co.	6,445 0 0
Bulled & Co.	7,130 0 0	Spencer, Santo, & Co., Ltd.	6,422 8 11
Leslie & Co., Ltd.	7,024 9 0	E. Triggs	6,419 0 0
J. & M. Patrick	6,855 0 0	Johnson & Co., Ltd.*	6,262 0 0
Treasure & Son	6,457 0 0		

FULHAM PALACE-ROAD.—Heating :—

J. & F. May	£865	G. & E. Bradley	£585
Purce'l & Nobbs	723	J. Esson	570
Wenham & Waters, Ltd.	709	Duffield & Sons*	550
Williams & Son, Ltd.	686		

GREENWICH-ROAD SITE.—Re-erecting two iron buildings removed from Montem-street site :—

T. Cruwys	£1,285	J. & W. T. Hunter	£975
Mitson & Co.	1,100	W. Harbrow*	774
Hawkins & Co.	1,005		

PARK-WALK.—Improvement. Providing new halls, 45 ft. by 27 ft. 6 in. for each department. New staircases for boys and girls, new cloakrooms and lavatories for each department. Re-dividing four classrooms into six, re-stepping, and additional lighting. Providing new drawing classroom, 740 ft. area. Providing heating chamber and low-pressure hot-water apparatus. Revised accommodation—Boys, 360 ; girls, 360 ; infants, 394 ; total, 1,114. Loss of ninety infants' places :—

Allen & Sons, Ltd.	£12,906	Simpson & Son	£11,594
T. L. Green	12,794	C. Cox	11,568
Lathey Bros.	12,629	Treasure & Son	11,544
Lawrance & Sons	12,449	Kirk & Randall	11,448
J. & C. Bowyer	11,833	Stimpson & Co.	11,380
Leslie & Co., Ltd.	11,765	J. & M. Patrick*	11,329
Johnson & Co., Ltd.	11,690	C. Wall	11,165

PONTON-ROAD (Day Industrial School).—Providing and fixing steam boiler, low-pressure steam cooking apparatus, and hot-water services, &c. :—

Whippell Bros. & Row	£1,305
Brightside Foundry & Engineering Co., Ltd.	1,034
Cannon & Sons	1,016
J. & F. May	970
Wortner Smith, Gray, & Co.	898
Duffield & Sons*	870

ST. ANDREW'S-STREET.—Refitting boys', girls', and infants' water-closets with separate pans and traps, &c., and connecting them to existing drainage ; also providing new lavatories for girls and infants :—

Martin, Wells, & Co.	£899 15	Maxwell Bros., Ltd.	£828 0
J. & C. Bowyer	888 0	R. P. Beattie*	670 10
Lathey Bros.	846 0		

TELFERSCOT-ROAD SITE.—Removing two iron buildings and appurtenances from the Brandlehow-road site, and one iron building (infants'), &c., from the Holbeach-road site, and re-erecting them on this site :—

T. Cruwys	£1,660	J. & W. T. Hunter	£1,225
Hawkins & Co.	1,399	Leather & Sons	1,162
Humphreys, Ltd.	1,261	Smith & Co.*	1,160
W. Harbrow	1,240		

UPPER HORNSEY-ROAD.—Special school for sixty children and manual training centre for forty :—

King & Son	£5,920	Wall & Co.	£5,219
Wilmott & Sons	5,696	Treasure & Son	5,214
Dearing & Son	5,567	C. Cox	5,190
Williams & Son	5,536	L. H. & R. Roberts	5,143
Gregar & Son	5,429	Outhwaite & Son	4,983
McCormick & Sons	5,410	Lawrance & Sons*	4,988
W. M. Dabbs	5,271		

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The Builder.

VOL. LXXXI.—No. 3066. NOVEMBER 9, 1901.

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Tunnelling.

PUBLIC attention has been directed more largely than ever during recent years to the subject of tunnelling, owing to the necessity experienced in all great cities of the world for improved means of communication, sometimes from one part to another of a crowded centre, and at others from the busy centre to outlying districts. At one time work of this particular description was confined to the city of London, but it has now spread to Glasgow and to several cities on the Continent and in America. As the railway system may be properly regarded as the primary cause of the extensive tunnelling operations inaugurated during the last century, so it may be held responsible for more recent developments. Not content, as formerly, to burrow merely through level ground, hills, and mountains, the aim of the engineer now extends to the construction of deep-seated passages that make light of the obstacles hitherto presented by natural irregularities of the surface, buildings, rivers, estuaries, and seas. In the present day tunnelling is almost invariably executed for strictly utilitarian purposes, whereas in former times tunnels were fashionable as burial-places for persons of rank and position, who were able, without inconvenience, to expend the necessary thousands in constructive work, the currency being then represented by the lives of slaves. During the Middle Ages tunnels were generally formed for military objects, or for securing the safety of wealthy people in those uncomfortable times when the sword was more powerful than the pen. Of course, as we all know, the Romans distinguished themselves in the making of tunnels for useful purposes, and their methods were not greatly improved upon until the employment of explosive agents became general.

Few works have hitherto been published descriptive of modern practice in tunnelling, and there is, therefore, ample justification for the treatise recently produced by Mr. Prelini and Mr. Hill, of New York.* The other chief works on the subject are Drinker's "Tunnelling," published in New York some years ago, and Simm's and Clarke's "Practical Tunnelling," of which the fourth edition was issued in London some five years back. Both of these are masterly expositions of tunnelling work, although neither of them is entirely suitable for a beginner or for the busy man who wishes to acquire general information with a minimum expenditure of time. Mr. Prelini, the originating author of the present treatise, experiencing the want of a text-book of moderate size and price, proceeded to enlarge his own lecture notes, written for use at Manhattan College, and with the co-operation of Mr. Hill, editor of the *Engineering News*, to produce the volume now occupying our attention. In the course of an interesting and condensed review of the development of tunnel building the authors usefully mention the directions in which electricity is destined to be employed in future work. Electricity is undoubtedly one of the most convenient forms of power available to engineers of all classes, and we quite agree that its application to hauling, hoisting, excavating, drilling, and ventilating machinery is capable of considerable extension.

Before any survey of new territory can be satisfactorily commenced it is necessary to know exactly what has to be done, and in some cases a preliminary survey, or reconnaissance, is desirable so that the character and magnitude of the task may be more adequately realised. A similar operation may be conveniently applied as a preliminary to our examination of the ground covered by the treatise with which we are at present concerned. At the commencement, we find that the authors have duly recognised the importance of furnishing readers with sufficient preparatory information to aid the comprehension of the details and principles that follow. After the disposal of introductory matter, various methods of tunnelling are discussed in detail, and the book concludes with a series of four chapters on accidents, repairs, ventilation, and cost.

In the introduction a tunnel is defined as "an artificial gallery, passage, or roadway, beneath the ground, under the bed of a stream, or through a hill, or mountain." We are sorry to say of this definition—evidently taken from the "Century Dictionary"—that it is not strictly accurate in characterising any passage beneath the ground as a "tunnel." In the first place, the passage must be horizontal to justify the appellation, for, if vertical, it is termed by engineers a "shaft"; in the second place, the definition loses sight of the distinction between tunnelling proper and the cut-and-cover method, which produces a "covered way" rather than a "tunnel." It may, no doubt, be convenient to use the term conversationally in the sense suggested by the authors, but students should be taught to discriminate between different kinds of underground work. Again, the dictionary definition is not sufficiently comprehensive, for, whilst referring specifically to the case of a stream, it does not notice the possibility of forming a tunnel beneath any other body of water. These little deficiencies serve to show that general books of reference cannot always be safely followed by writers of purely technical works, in which the most precise terminology is invariably to be desired.

The first preliminary consideration placed before the reader is the choice between a tunnel and an open cut, and, to quote the words of the authors, "the answer to this question depends upon the comparative cost of construction and upon the relative commercial and structural advantages and disadvantages of the two methods." These factors are discussed briefly, but sufficiently to enable any one to apply them to the determination of any particular case. In general practice an open cut is seldom adopted for any great distance if a vertical depth of more than 60 ft. should be required, but this does not constitute an absolute rule, as the character of the ground must always be taken into account. We may

* "Tunnelling." A Practical Treatise. By Charles Prelini, C.E., with Additions by Charles S. Hill, C.E. (London: Crosby Lockwood & Son; New York: D. Van Nostrand Co. 1901.)

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also add that the engineer should make it his study to avoid the necessity for tunnels as far as possible in any portion of a line of communication. Having once decided to build a tunnel, the engineer must ascertain the nature of the strata through which it will pass. For this purpose the diamond rock drill is recommended by the authors as affording most efficient aid. This appliance possesses the advantage of boring an annular hole, thus furnishing for examination a core which shows the character, position, and thickness of the different strata penetrated. A sufficient number of borings along the proposed course of the tunnel will frequently render unnecessary the adoption of other trial operations, but it is often quite impracticable to make such borings owing the height of a mountain ridge or to other conditions. For the guidance of the engineer in such cases the study of geological characteristics is recommended by the authors. As a matter of fact, information of this nature is frequently more valuable than that obtainable from actual borings. A geological survey is especially useful for the settlement of preliminaries, and trial borings may afterwards be made to prove the accuracy or for the correction of theoretical deductions before tunnelling is commenced in earnest. The discussion of geological surveys in Chapter I. includes some very useful notes on the different rocks and soils encountered, on their merits and demerits from the point of view of a tunnel builder, and on the presence and pressure of water in such strata. Chapter II. deals with methods of setting out tunnels, and the forms and dimensions of their cross sections. For ranging and setting out the centre line, we are told that an ordinary theodolite is sufficient for all practical purposes. This does not seem good advice, as it is highly desirable that the instrument should be available for ranging one continuous line in two opposite directions from a station. In all other points the general practice is clearly and intelligibly set forth, yet without going into such minute details as belong more appropriately to a manual on surveying.

The forms and dimensions of cross-section are of much importance, and the form for adoption in any particular case must depend upon the pressures to be resisted; these being necessarily affected by the nature of the material penetrated by the tunnel. Mr. Prelini has here resisted a very obvious temptation to enter upon a mathematical demonstration, and has confined his remarks to a general explanation of the causes leading to the employment of the forms of cross-section in most frequent use; namely:—A section with arched roof and vertical side walls for hard rock; an elliptical section for softer materials; and a circular section for quicksands and mud. The elliptical form with an inverted arch at the floor is largely employed, the invert being intended to protect the side foundations from injury by horizontal pressure of the earth. In mentioning an important exception to the ordinary practice, the authors have evidently no thought of London in their minds when they say that in some of the underground city rapid-transit railways built of late years, a rectangular or box section is employed. Readers of the English edition will probably agree with us in thinking that the work would be a little more complete if the tubular form of section were also mentioned in this connexion. Some comment as to the shape suitable for rock tunnels requiring no lining could also be included with advantage. For instance, in the case of igneous rock, a section of any form convenient for traffic can be employed, but the elliptical with a level floor is most usual. It is implied that a pointed arch is generally desirable in stratified rocks, and it might be added that a flat roof may be permissible if the rock formation is in thick layers with few natural joints. A necessary caution is given in the paragraph dealing with sectional dimensions, that the deformation of the lining masonry must be duly considered. Although the whole structure may not sink more than 3 or 4 in., yet allowance must be made for movement of the side walls towards each other, and for the settling of the roof arch. These matters are of considerable importance, and we are glad to see them mentioned.

The next six chapters continue in a general way the discussion of preparatory information. Thus, attention is devoted to excavating and hauling appliances, and to methods of excavating, timbering, and lining tunnels. Excavating machines are not treated in an entirely satisfactory manner in Chapter III., for no mention is there made of the various shields employed, in Europe and in America, for the driving of tunnels. One of the functions of a shield is clearly to perform a part of the excavating work, and some such appliances are provided with auxiliary apparatus for completing the excavation and for the removal of material. Under the circumstances it seems a little inappropriate to say that "the most recent attempts to use excavating machines in soft ground. . . . must be classed as experiments rather than as examples of common practice." Rock drills receive more adequate notice, although the reader will not obtain full information as to details and methods of application until he has arrived at a further chapter on the subject, which for some reason is inserted in that section of the treatise dealing with methods of tunnelling. After considering the different forms of explosives and the manner in which they are employed, the authors pass on to discuss "General Methods of Excavation, Shafts, and the Classification of Tunnels." A good deal of necessary information on these subjects is given in very compact form, and the tabular classification at the conclusion of the chapter is well worthy of careful notice, as it serves to prevent confusion when different classes of tunnels are under subseqnent treatment. One blemish that must be mentioned is the inclusion of "tunnels under or on a river bed" under the head of "submarine tunnels," and the exclusion therefrom of tunnels formed beneath the sea. The term "sub-aqueous" might appropriately be employed to cover all types of tunnels under water, and we believe it is to be found in American as well as in English dictionaries.

In opening the subject of "Timbering or Strutting Tunnels," attention is wisely directed to the great care necessary in respect of design and execution, as well as to the desirability of using timber of elastic nature so that warning of approaching collapse may be afforded. Hard woods somewhat resemble cast iron in resisting until the last moment, and in giving way suddenly under the breaking load; moreover, they are of greater weight, and thus entail additions to the cost of labour and other expensive items that may be avoided by the employment of softer and lighter woods. A very complete description of the different modes of supporting headings and shafts in rock, and in loose materials, will be found in this chapter, and amongst the most interesting of the illustrations are those of the longitudinal and transverse poling board systems, and forms of strutting for treacherous materials. Some practical details as to the quantity and dimensions of timber required for the support of headings, tunnels, and shafts, ought to be of considerable service to the student. Timbering for the full section of a tunnel is briefly described, but the absence of diagrams somewhat detracts from the value of the letterpress. The concluding part of the chapter is occupied with references to iron strutting for tunnels and their auxiliary works. Perhaps the most interesting form of construction here mentioned is the sinking of shafts in soft ground by the aid of cast-iron segmental rings. The shaft is sunk in a manner similar to that adopted in brick-lined shafts where a "drum-curb" is employed for supporting the ring of brickwork. Instead of the drum-curb, a cast-iron ring is used having a cutting edge, and successive rings are added to form the permanent shaft lining as the work of sinking progresses. Only the briefest explanation is given by the authors of this extremely useful class of work, which is specially to be recommended in all cases where interference with underground springs might be detrimental to the foundations of buildings, and we may remark in passing that it has invariably been adopted in connexion with the low-level railways constructed during recent years in London. After the interpolation of two chapters relating to "Methods of Hauling in Tunnels" and "Types of Centres and Moulds," the discussion of internal supports is resumed, with special reference to the permanent lining of tunnels. This important subject is somewhat lightly dealt with, although the different methods are sufficiently described to impart a fair amount of general knowledge.

Chapter IX., on "Tunnels through Hard Rock," is largely occupied by a discussion of the machinery and appliances used for construction of tunnels in such strata. Recent experience fully justifies the remark that "the present high development of labour-saving machinery for excavating rock renders this material one of the safest and easiest to tunnel of any with which the engineer ordinarily has to deal." Machinery of the kind, however, requires considerable power, which has often to be transmitted to great distances, and has always to be applied to the tools with due regard to economy. At present the transmission of power is almost entirely effected by compressed air or hydraulic pressure, and it is to be hoped that electric power transmission may soon become generally available. Some further observations upon engineering plant are contained in Chapter XII., and it is by no means clear why the two descriptions should be separated. Possibly the authors may suppose the reader will not be able to grasp the information contained in the latter chapter until the intervening matter has been studied. As a matter of fact, however, there is nothing at all difficult of compre-

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hension, and it is both inconvenient and confusing to have a subject split up and scattered about in different parts of a book in this manner. On the topic of excavation we find two methods are described of driving "the advanced drift or heading." It will be observed that the words "drift" and "heading" are used by the authors as synonymous terms, and yet a little later the following passage occurs:—"The Mont Cenis and Simplon tunnels are selected as examples of rock tunnels driven by a drift, and the St. Gothard and Busk (U.S.A.) tunnels as examples of rock tunnels driven by headings." As this book is ostensibly written for students, it is not unreasonable to suppose that some perplexity will result from this implied axiom, that things which are equal to the same thing are *not* equal to one another. We now look for some description of "excavation by headings," but find none, although later on, under the title of "excavation by drifts" the method is described without being anywhere clearly defined. Turning over some thirty pages, we accidentally encounter the heading "excavation by drifts," and here curiously enough is found a description of "excavation by headings." Finally, quite at the end of the section devoted to "Tunnels through Hard Rock," is found a paragraph where a "drift" is defined as an advance gallery opened along the floor of the tunnel, and a "heading" as a gallery coinciding with the upper part of the tunnel section. Definitions are always desirable at the outset, especially when distinctions are implied that are not universally recognised. Apart from these comments there is not much to find fault with in the chapters on "Tunnelling through Hard Rock." There is a good account of the Mont Cenis Tunnel, and a diagram clearly showing the sequence of excavation. A lengthy abstract from a paper read by Mr. Fox before the Institution of Civil Engineers on the Simplon tunnel, forms instructive reading, and the accompanying sketches add to its usefulness.

In Chapter XIII. the discussion on "Excavating Tunnels through Soft Ground" is commenced. This material includes many different grades, from stratified soft rock to the most unstable sands and clays, and the authors are justified in saying that if the easy and difficult materials be classed together the excavation of tunnels through soft ground is the most difficult task that confronts the engineer. Sometimes operations can be conducted with comparative facility, while at others uncertainties and obstacles occur which render the work more interesting to the engineer than to the contractor or others who may have to pay the bill. In the book before us, the Belgian, German, English, Austrian, Italian, and "quicksand" methods are grouped together in four consecutive chapters, permitting of ready comparison. The first five of these modes differ chiefly in the order in which the details of work are undertaken, in the number and dimensions of the headings, and in the forms of strutting employed. Quicksand methods naturally include tunnelling by the pneumatic shield, but no hint of this fact is vouchsafed by the authors beyond the statement that the shield system of tunnelling is, for the present, left out of consideration. If the reader institutes an industrious search he will ultimately find a full description of shield-driven tunnels under dry land in the chapters headed "Submarine Tunnelling." The Belgian and German methods are carefully discussed, and their essential characteristics are clearly shown by the aid of diagrams. One great disadvantage in each instance is the fact that the invert is not built until the side walls have been finished, and there is consequently always a danger of distortion by reason of lateral earth pressure. Some notes upon accidents and repairs serve to emphasise the undesirable features of these modes of tunnelling. The German system is more logical than the Belgian, and having been adopted in connexion with the Baltimore Belt Line tunnel, it is the subject of rather extended notice. The most advantageous feature appears to be in the initial excavation of an annular gallery, in which the side walls and roof are built before the centre core is removed. Thus an excellent support is secured for the strutting and the roof centres. Apart from the inconvenience and expense caused by the narrowness of the spaces available for hauling, the German method is fruitful in mishaps, and the records of the Baltimore tunnel are conclusive on the point, as the following brief summary will show:—The masonry lining flattened at the crown and bulged at the sides; there was sinking of the street surface varying from 1 in. to 18 in.; water and gas mains were damaged and in some instances had to be reconstructed; and at one point along the tunnel the surface settlement caused the collapse of an adjacent building. This comprehensive experience may serve as something more than a suggestion that the German mode of work is not likely to commend itself to municipal authorities in this country, especially in the vicinity of historic buildings.

In Chapter XV., the English method of tunnelling through soft ground is the subject of discussion. As stated in the treatise, the distinctive features of the system are the excavation of the full tunnel section at once, the use of longitudinal strutting, and the alternate execution of excavation and masonry work. It ought to have been added that the masonry is commenced in a common-sense way by the construction of the invert. The authors do not appear to favour the English method as a whole, though they admit that the mode of strutting has gained particular favour in America, and is commonly employed there "even when the mode of excavation is distinctly German or Belgian in other respects." We are told that the English method has gained unusual popularity in this country "owing to the general prevalence of comparatively firm chalks, clays, shales, and sandstones," and that in its entirety it "is confined in actual practice pretty closely to the country from which it receives its name." As there is no American method of tunnelling, it might be inferred from these comments that engineers in the United States prefer the Continental methods, whose defects are so clearly demonstrated in the treatise, were it not for the subsequent and somewhat contradictory statement that our own system "has been used in building the Hoosac, Musconetcong, Alleghany, Baltimore and Potomac, and other tunnels in America." Coming to details, we find the mode of procedure is fairly well explained, and due recognition is given of the fact that the method is applicable to "loose soils and very loose soils," as well as to the firm materials previously suggested as the elements chiefly contributing to its popularity. The description of strutting is correct, so far as it extends; and if the arrangement of raking-props and poling-boards, as commonly used, were included, it would be fairly complete. Remembering that a fully-detailed and illustrated account of the Baltimore Belt tunnel was given, serving—perhaps unintentionally—as an awful example of the German method as practised in America, it might have been expected by the open-minded reader that some adequate notice would be included of a typical work constructed according to the English method. If American data were not available to the writers, plenty could have been obtained from British sources. One of the most successful examples is the railway tunnel under the Metropolitan Cattle Market, where the surface subsidence in open ground did not exceed 3¼ in., and under buildings was only from 1 in. to 1¾ in., several heavy buildings being undermined without the slightest injury. Such a record as this is certainly of interest to engineering students, whatever may be their nationality. When adverting to the Austrian method, the writers make the remark that whilst in some respects its principle is similar to the English, "the construction of the invert last exposes the side walls to the danger of being squeezed together, causing a rotation of the arch as in the Belgian method of tunnelling." In justice to Austrian engineers, it should here be observed that in treacherous soils the practice of building the invert first is usually followed. A chapter devoted to the special methods sometimes adopted in treacherous ground is well worthy of study. Of these the Italian system consists in excavating the bottom half of the section by means of successive drifts, after which the invert and a portion of the side walls are built. The space is then refilled, and the upper half of the section is excavated, when the remaining part of the side walls and the roof arch are built, and, lastly, the lower part of the tunnel is cleared of filling. Several serviceable diagrams and sketches are included to make clear the successive stages of the Italian mode, of which the chief disadvantage is excessive cost, practically limiting its employment to works of comparatively small section.

Quicksand tunnelling, as the authors remark, can be performed by modifications of other methods, the object being to drain away water from the tunnel and to hold back the particles of sand by means of timber lining. We have looked, but in vain, for any expression of opinion in this chapter that the process of draining away water from the subsoil should never be attempted in the vicinity of buildings. This is an undesirable omission from a work intended to instruct the rising generation. Here is the very place for a brief reference to the advantages afforded by the pneumatic-shield method. As a conclusion to the chapter, a short mention is made of the pilot method which was adopted in the uncompleted Hudson River tunnel. Compressed air was there used to keep back silt and water, and to prevent injury to the iron tube forming the pilot heading. Further details of this interesting work would be instructive to student readers.

Chapter XVII. on "Open-Cut Tunnels" is full of valuable matter, especially to those who are directly or indirectly concerned

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with the essentially modern problem of traffic accommodation in cities. In the opening portion of the chapter, three methods of work are outlined, the single and parallel longitudinal, and transverse, trenches. Single cuts to the full width of the subway section are not suitable for municipal works, because they generally involve the entire interruption of traffic in the streets traversed. The parallel mode of excavation, as recently followed in the case of the Paris Metropolitan railway, permits one half of the roadway to be open for traffic during the continuance of operations; and the third method, as exemplified by the Boston Subway, does not necessarily interfere with traffic at all. Reference is also made to the forms of construction somewhat paradoxically termed in the treatise "Tunnels on the Surface." Work of this kind is no doubt occasionally necessary, especially abroad, and the authors are wise in mentioning it, although they might perhaps have found a more appropriate designation. The remainder of the chapter is occupied with an excellent discussion of tunnels under city streets, which will thoroughly repay careful perusal. It is highly probable that the low-level subway will not be the only type of underground passage to provide for the present and future requirements of the metropolis. Tunnels near the surface possess many advantages, and their construction beneath the chief thoroughfares would permit the establishment of readily-accessible electric tramways, besides enabling the authorities to deal with the troublesome question of gas, water, and other conduits. There is much valuable and essentially modern matter in the descriptions of the Boston Subway and the New York Rapid Transit Railway. Both of these important undertakings are fully considered and well illustrated in the treatise before our notice.

Chapter XVIII. resumes the interrupted subject of tunnelling proper, and is devoted to so-called "Submarine Tunnels." As a preliminary to such an undertaking, the authors properly emphasise the necessity for ascertaining the character of the material in which operations will be conducted. Investigations of the kind proposed cannot put the engineer in a position to do much more than to prophesy, more or less accurately, what will be the nature of the difficulties awaiting his attention, and it not infrequently happens that strata of soft or treacherous soil are encountered of which no indication has been afforded by preliminary investigation. The Milwaukee Water Supply tunnel and the East River Gas tunnel are cited as examples of "submarine" tunnels begun in firm soil, that passed into material of treacherous character after the work had proceeded for some distance. In the treatise the following classification of so-called submarine tunnels is adopted:—(1) Tunnels in rock, or very compact soils; (2) tunnels in loose soils; (3) tunnels on the river bed; (4) tunnels partly in firm soil, and partly in treacherous soil. In the first place, we must point out that the title of the chapter, apparently, compels the authors to omit the Central London Railway from mention, presumably because that work does not pass beneath a river, and, therefore, is not "submarine." Tunnels of Class 1, being driven by any ordinary method, require no special mention. Those of the second class may be driven by shields, by the aid of compressed air, or by shields and compressed air together, whilst those placed in Class 4 hardly constitute a distinct type, and are to be dealt with as the variations of the material demand. The methods necessary for tunnels of Class 3 are distinctive, and involve the use of cofferdams or caissons, as may be most suitable for individual cases. The four chapters on "submarine" tunnelling are of considerable interest and value, and contain much admirably expressed information upon modern tunnelling practice, including details relative to the Severn tunnel, the East River tunnel, New York; the Van Buren-street tunnel, Chicago; and the Milwaukee tunnel. The fourth chapter of the series includes a well-written historical sketch of the shield system; diagrams of the shields employed in the construction of the Thames tunnel, and what is termed "London Tower" tunnel; as well as detailed drawings and descriptions of the more modern appliances adopted for the City and South London Railway, the St. Clair River tunnel, the Blackwall tunnel, the Clichy sewer, and of the roof shield for the Boston subway.

Of actual excavating processes there is now nothing more to be said, but the concluding chapters of the volume are quite as important as those by which they are preceded. The first deals with "Accidents and Repairs" in tunnels, during and after construction, a subject that is carefully and thoughtfully treated; the second, on "Relining Timber-lined Tunnels with Masonry" is equally deserving of commendation, though it is more applicable to the reconstruction of American railway tunnels than to work in this country. The fourth chapter is devoted to the vital questions of "Ventilation and Lighting," and might have been extended with advantage. The final chapter on "The Cost of Excavation and Time Required" is based entirely on American and Continental records. That there should be no British data on these points in a work courting the support of readers in this country seems to be a little unfortunate, because students are not afforded the means of making comparisons that would be useful in a particularly practical sense.

Regarding the work as a whole, it may be justly considered as a praiseworthy and successful effort to place on record in a readable style all the distinguishing characteristics of tunnelling methods practised in the present day. The treatment throughout is descriptive rather than mathematical, and those requiring general information on this highly important subject will find it presented in a thoroughly practical and intelligible form.

NOTES.

Municipal Trading.

The address last week of the Hon. Horace Porter, the United States Commissioner in Cuba, to the London Chamber of Commerce, on the subject of municipal trading, was interesting as being the opinion of a disinterested observer of affairs in England. Mr. Porter is much struck with the apparent want of system which prevails in this country. He finds the London County Council with no authority over the water supply, but carrying on in part of the town the business of a tramway company. The same contradictions he notes everywhere, and more especially the curious fact that the telephone system is to be partly in public and partly in private hands. In Mr. Porter's opinion private enterprise can do more for the public benefit than a municipality, and he would seem to desire to limit the work of municipalities almost entirely to the supply of water and light. But the value of private enterprise depends chiefly on the openings for competition, and the moment a private body obtains a monopoly there can be no doubt that it is likely to be less efficient than a municipality, since the latter can usually be stimulated by the ratepayers. No doubt the latter are often apathetic, but, on the whole, a municipality is more sensitive to public opinion than is a private corporation, and, moreover, is never in the tight place for funds in which a private trading company may find itself. But it is also true that there may be instances in which a municipality may be going beyond the proper mark in undertaking work or in pledging the ratepayers' money. There is, for example, no doubt whatever that the Corporation of Manchester ought never to have lent money to the Ship Canal Company.

Electric Lighting at Hackney.

The extensive electric lighting works of the Hackney Borough Council, which were formally opened last week, are representative of the trend of modern electrical engineering. The pressure at which consumers are supplied for lighting purposes is the highest allowed by the Board of Trade, namely, 240 volts. The system is three-wire direct current, even although some of the feeding points at which the load is heaviest are over two miles from the central station. Consumers who desire motive power are supplied at 480 volts, which is the pressure between the two outer mains of the supply system. The benefits which accrue to consumers from this higher pressure are the cheap rates at which power is supplied, the charge being only 4d. per unit for lighting and 2d. per unit for motive power. Personally, we prefer electric lighting at 100 volts, as we consider that ordinary 100-volt lamps are much more efficient than 200-volt lamps. Again, electrical engineers are beginning to minimise the risks of shock. At a recent visit of inspection to the Portsmouth Electric Tramways Mr. Trotter, the electrical adviser to the Board of Trade, demonstrated by touching the trolley wire under a railway arch that the risks of shock were greatly exaggerated. These risks may be exaggerated, but considering the number of foolhardy people there are in the world, we think that this exaggeration does more good than harm. Demonstrations by electricians that under certain definite conditions it is safe to touch a live 500-volt or 20,000-volt wire teach nothing to experts, and only tend to mislead the public. Mr. Hammond has made the risk of serious shock at Hackney a very small one by using triple concentric mains similar to those used in Glasgow, and as the outer cylinder will naturally always be nearly at the same pressure as the earth, no pressure greater than 240 volts will be able to be got at by the public, who only use the lighting supply. A special feature of the Hackney scheme will be the utilisation of refuse for the generation of electrical energy. The refuse destructor, when finished, will consist of twelve furnace cells, capable of burning 160 tons of refuse per day. The refuse will be practically automatically

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handled from the time of its arrival at the works until it is carted away as clinker. A powerful blast fan will enable it to be burned at a high temperature, and the hot products of combustion will be utilised for raising steam in three of the six water-tube boilers.

Greenhouses and Glasshouses.

At the present day, when market gardening is becoming more and more an important business, the recent decision of Mr. Justice Cozens-Hardy in the case of Mears *v.* Callender is of considerable interest and importance. It raised, in the first place, the question whether a tenant could take away glasshouses erected by him for the purposes of his business and without the written consent of the landlord. The glass roof rested, in the case of one house, on concrete sides; in the case of the other houses wooden piles were driven into the ground, on the top of which sills were placed which supported the glass span roof. These roofs were nailed to the sills, which in their turn were nailed to the posts. "If," said the Judge, "erected for the mere purpose of pleasure and ornament and not for the purpose of a trade, they would not be removable," but he held that being erected for the purpose of trade they could be removed. It was unnecessary for the purposes of the case that the removability of ornamental conservatories should be considered, but it is, we think, doubtful if the law in this respect is as clear now as Mr. Justice Cozens-Hardy seemed to think. We can see no reason in principle why glasshouses lightly affixed to concrete or wooden foundations should not be as removable as tapestry fixed to a wall. The case in regard to these glasshouses for trade purposes up to the date of this last decision has not been altogether clear, but the Judge could hardly decide in any other way than he did, for, as he rightly said, "the whole tendency of the Courts in recent years has been to enlarge the rights of tenants in respect of fixtures," and we may add, in respect of domestic, as well as of trade, fixtures. It has, however, to be noted that tenants must still be careful in regard to this class of building, because sometimes, as in the present case, the lease may expressly exclude the action of the Agricultural Holdings Act, the thirty-fourth section of which enables the tenant to remove such things as glasshouses. Therefore, if this Act is expressly excluded, the tenant has only what is called his common law rights to rely upon, and it is only by virtue of these rights that he can remove glasshouses erected for the purposes of trade.

Church of St. Jean, Montmartre.

The new Church of St. Jean at Montmartre, which is being built to replace the old Church of St. Pierre, adjoining the immense basilica of the Sacré Cœur, has again got into difficulties with the administration, and the Prefet de Police has given orders to the architect to stop the work of construction at once and to proceed to demolish the building, which is now nearly completed. This church has already attracted considerable attention in architectural and building circles, first on account of the novel style of architecture which M. de Baudot, the well-known Diocesan Architect, has given to his design, and again by reason of the nature of its construction, entirely in armoured brick and cement called the Cottançin system. The Prefet de Police requires the immediate demolition of the church under a penalty of 4*l.* per day of delay, simply because a proper demand for permission to construct was not made by either the architect or the vicar of the parish. The latter, considering that he had the right to build in spite of the Prefet, continued the work. It appears, however, that the Prefet is exceeding his rights, and that the vicar will win the day, for, according to the law relating to building rights, no demand for permission to construct a church on one's own property is necessary. The case is exciting great interest in Paris, for nearly 16,000*l.* of building work has already been done on the church.

The Westminster County Court, St. Martin's-lane.

The Commissioners of Works recently addressed the Mayor and Corporation of the City of Westminster with the object of learning which of the old Vestry buildings will no longer be required, and whether any of them can be rendered available as a new County Court for Westminster. The lease of the County Courthouse in St. Martin's-lane expired not long sinc. A proposal has been formulated for transferring the County Court business to the somewhat remote Town Hall in Caxton-street, Westminster, which the municipal authorities will vacate upon the completion of the alterations of St. Martin-in-the-Fields Vestry Hall, which are now being carried out, under the directions and superintendence of Mr. John Murray, for its conversion as the Hall of the City of Westminster. The County Court in St. Martin's-lane was established about fifty years ago to replace the Court of Requests, of which the business had been conducted in premises (formerly a Baptist chapel, and since demolished) that stood at the rear of the County Court-house. A new boundary will shortly be assigned to the limits of the jurisdiction of the County Court. They have hitherto extended to the wide area having the City boundary on the east, the Thames on the south and south-east, a winding line from Chelsea Bridge to the north end of the Serpentine on the west, and the high road from Bayswater to Holborn Bars on the north. That area is fairly co-terminous with the older confines, since reduced, of the parish of St. Margaret. The Hall in Caxton-street was built on the site of St. Ermin's-hill workhouse in 1881-3, from the designs, selected in competition, of Messrs. Lee & Smith.

Charing Cross Hospital and its Site.

This institution, being at that time the eighth of its kind in London, was established for the two-fold purpose of a dispensary and a hospital by the exertions of Dr. B. Golding as an extension of the neighbouring charity founded in 1818. The present buildings were erected in 1831-3 after Decimus Burton's plans and designs as a part of the scheme of the Commissioners of Woods and Forests for the improvement of the western portion of the Strand, in pursuance of the Act 7 George IV., c. 77, Lord Lowther being Chief Commissioner, and W. C. Mylne acting as valuer on behalf of the Government. The principal front extends along all the western side of Agar-street, the return fronts along Chandos and King William streets continue the triangle, at the apex of which is the Ophthalmic Hospital established in 1816. In 1870 some interior alterations, including the principal staircase, were carried out by James Thompson; and about that time the Governors acquired one or two houses in Chandos-street. In 1898 the Commissioners of Woods and Forests agreed, upon certain conditions, to sell to the Governors of the hospital for 16,114*l.* the freehold sites of Nos. 23-7, King William-street, of "Toole's" (formerly the Charing Cross) Theatre, and of Nos. 15-6, Chandos-street, to provide space for a new out-patients' department, with other needed improvements of the hospital buildings. The ground was finally cleared in the course of last year, and Mr. A. Saxon Snell, whose designs secured the first place in a limited competition, was appointed architect for the alterations and additions in respect of which a tender of Messrs. Holloway Bros. for 82,730*l.* has just been accepted. The Charing Cross Theatre had been built as the Polygraphic Hall in 1847-8 on the site of the residence and chapel of the Fathers of the London Oratory of St. Philip Neri, after the designs of James Thompson, whose son, John J. Thompson, rebuilt it for Mr. Toole in 1883. The theatre, which had latterly been the domicile of the revived Beefsteak Club, was pulled down five years ago.

St. Nicholas' Parish Church, Deptford.

We read that the fabric of the tower, from the level of the belfry floor upwards, of the church has been condemned as being in a dangerous condition. The structure suffered damage during a gale on October 17 last. The Early English tower, constructed of stone, formed in past times a conspicuous landmark for the shipping in the Thames. The church, situated between Deptford Green and the Stowage, was enlarged in 1630, and the nave, aisles, and chancel were rebuilt, of red brick, in 1697. A few years ago a fine piece of carving in oak, representing Ezekiel's Vision in the Valley of Dry Bones, and attributed to Grinling Gibbons, was removed from the charnel-house porch into the interior of the church. The organ, originally by Smith (1697), was rebuilt in 1868 by Hunter, and since repaired by Bevington. Amongst the monuments are those in memory of two of Evelyn's children, of Captain Fenton, who accompanied Frobisher on two voyages, and of several naval commanders who fought against the Dutch, French, and Spaniards at sea. The burial-ground, covering 1¼ acre, which is detached, and has an entrance in Wellington-street (formerly Flagon-row), was laid out, at a cost of 300*l.*, by the Kyrle Society, and opened to the public on July 9, 1884.

Housing of the Working Classes.

At the annual meeting of the Workmen's National Housing Council in Clifford's Inn Hall, on November 4, Mr. Raymond Unwin delivered a lecture on "The Housing of the Working Classes." The lecture was well illustrated by lantern slides of plans of the numerous efforts of municipalities and others to meet the want, which were used by the lecturer chiefly as examples of what to avoid. He compared the existing system of laying out artisans' dwellings in streets with the plan of arranging them in quadrangles advocated by him. Mr. Unwin claims that by the latter arrangement the difficulty of aspect is got over, and living

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rooms facing the back have a cheerful and healthy outlook, unlike the sunless outlook from the living rooms of many recently erected workmen's dwellings, and area within the quadrangle is more advantageously utilised as a recreation space, free from passing traffic. He urged the benefit of common rooms and common laundries at each of the four angles of the square as a satisfactory solution of modified co-operative living, which can only be successful by judicious limitation, the lack of which, to a great extent, is responsible for the failure of the Boundary-street common laundry scheme. Mr. Unwin showed several more or less successful plans of cottages on the quadrangle principle, with free backs unbroken by projections, which are always to be avoided where possible. His ideal schemes are more suitable for the country than the heart of London. The arrangement of rooms successfully meets the difficulties, but might have been more simple, and many of the sketches shown were scarcely models of good design. Some interesting slides of Port Sunlight and Mr. Cadbury's model dwellings were put on the screen. Several delegates from London municipal building committees were present and took part in the discussion.

The Bazalgette Monument.

In the monument to Sir Joseph Bazalgette, unveiled on Wednesday by the Chairman of the London County Council, Mr. Geo. Simonds, the sculptor, has followed the wise French fashion of making the monument a portrait bust in an architectural framework, instead of attempting a full-length figure in modern costume. The framework consists of pilasters and an entablature in white marble, let into one of the large and hitherto useless pylons of masonry which diversify the embankment; the bronze head being placed in the enclosed space, relieved against a deep hollow which makes a shadow behind it. The pilasters, as well as those of the podium, are carved with ornament partly symbolical; the cartouches on each side of the podium seem to want some emblem on them to give them a use and meaning. The only part of the work we do not like is the realistic outbreak of foliage beneath the bust. Realistic metal foliage is always disagreeable, and it is the more so in this case because it is out of keeping with the conventional character of the carved marble foliage. But as a whole this is far superior in general conception and æsthetic treatment to the majority of the Thames Embankment monuments.

The Fine Art Society's Gallery.

The Fine Art Society have on view a collection of cabinet pictures by Mr. Talbot Hughes, of somewhat uncertain interest. They are mostly single figures in the costume and with the interior surroundings of the eighteenth century, all well painted up to a certain point, but not possessing that special power and finish in execution which can render a mere figure and interior interesting for its own sake and as an example of fine execution; while a good many of them have no other kind of interest. Among the exceptions which have more marked character in conception and execution are "Changing Vases" (2), "The Fan Painter (9), "Spoils of the Road" (13), and "The Dreamer" (24), the latter a very pleasing study of a handsome young man in the beautiful dress costume of the period, leaning back in some rather happy imagination. "The Violinist" (27) does not know how to hold her violin, and is no virtuoso, though a pretty girl (with, however, an alarmingly thin waist). "Memory" and "Echo" (35, 37), in spite of their titles, are little more than costume studies with wax heads. "Virtue" (36), a study for a larger picture, promises something higher than most of the finished works in the collection. The usual puff preliminary, prefixed to the catalogue, is in this case carried to a pitch which is more likely to injure than to serve the subject of it.

The Decorations at Victoria.

The decorations at Victoria Station last week, put up in honour of the return of the Duke and Duchess of Cornwall, deserve a word of recognition; for though not attempting anything novel or original, they were well and tastefully done. The emphasising of the constructional girders of the roof, longitudinal and transverse, by a deep draping of a bunting in three strips of colour under each, was very effective, and showed the proper perception that temporary decoration in such a case should follow and be controlled by the lines of the construction. Outside of this portion was an arrangement of flags of various nations, drooped vertically, forming a kind of framework to the whole.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The first meeting of the Royal Institute of British Architects for Session 1901-2 was held on Monday at No. 9, Conduit-street, the President, Mr. William Emerson, presiding.

Recently Deceased Members.

The minutes of the last meeting having been taken as read,

Mr. Alex. Graham, F.S.A., hon. secretary, said he regretted to announce the decease of several members since the last meeting, *i.e.*,

Mr. William Larner Sugden, of Leek, who was elected a Fellow in 1892. He was a well-known architect in that neighbourhood, and was no doubt well known to many members of the Institute.

Mr. Robert Isaac Bennett, of the firm of Royle & Bennett, of Manchester. He erected a large number of edifices, and was an architect of very high repute.

Mr. Yeoville Thomason, of Birmingham, elected a Fellow in 1862. He was the architect of the Municipal Buildings and Art Gallery of Birmingham.

Mr. Herbert R. Lloyd, of Birmingham, elected an Associate in 1887. He was architect of the Technical Schools at Redditch; he restored St. Mary's Church at Cowes, in the Isle of Wight, and was a very prominent and active member of the Architectural Association of Birmingham.

Mr. John Mackland, elected an Associate in 1881 and a Fellow in 1892.

Mr. John Littlewood, of Manchester, well known as a member of the firm of Mangnall & Littlewood, who had erected a number of public buildings in Blackpool and other places.

Mr. James Brooks, a gentleman well known to all of them, whose decease called for something more than a passing comment. Mr. Brooks was elected a Fellow in 1866, and his loss was to be deplored for many reasons. He was not only a familiar figure in that room and a constant attendant at the meetings of the Council, of which he was a member for a long number of years, but he was more than that: he was one of the few survivers of the old school of Pugin. Mr. Brooks never swerved during his long career in the principles enunciated in that school, and he remained a disciple of Pugin, who was the exponent of the great Gothic revival in this country fifty or sixty years ago. Mr. Brooks was an excellent church planner, the lines of his compositions were marked by simplicity, and there was one quality he possessed in a remarkable degree (and he mentioned it because it was a little opposed to the modern school of followers of Gothic work), *i.e.*, the quality of restraint, which was observable in most of his works. He (the speaker) therefore commended to the notice of the younger generation of architects the ecclesiastical work of James Brooks.

An Honour for the President.

Mr. Graham then announced that the President had been made an honorary member of the American Institute of Architects. The goodwill shown to them by their American brethren was, he felt sure, reciprocated by every member of the Institute, and he hoped the day was not far distant when it would be possible for the President to cross the Atlantic and attend one of the gatherings of the American Institute as the representative of the British Institute.

The announcement was warmly received, and the President briefly referred to it. He had, he said, crossed the Atlantic once, and he was not anxious to do so again. Still, he felt the honour which the American Institute had done him and the Royal Institute by electing him a member of their society, and he highly appreciated it. His feelings of sympathy with their American cousins in the dastardly assassination of President McKinley caused him to send a telegram to the American Institute sympathising with them in the loss the country had sustained, and he received a very kind reply from the President, and since then he had received notice of the appointment he had referred to. He would always have a very keen remembrance of the pleasant time he spent in America when he went over there as one of the judges in architecture at the Chicago Exhibition. It was a great pleasure to meet so many clever men—architects, sculptors, and literary men, and he would always recollect it with lively satisfaction. He thought the American school of architecture was doing excellent work; they were doing what certain members of the profession in England were urging the rising generation to do, and that was to let their imaginations have vent in solving the problems necessary for modern civilisation; but they had a certain amount of restraint in all their work, and they were always studying the best examples of Classic and Gothic architecture. A large number of them had studied at the Ecole des Beaux-Arts in Paris and had returned to America, and were bringing up a class of men thoroughly grounded in ancient work, which was the best ground for training the imagination in working out modern problems.

Bequests to the Institute.

The President then said that a gentleman whose death was announced some time ago, and whose interest in the Institute was as great as any man's since the Institute was started—he referred to Mr. Arthur Cates, who took such a great interest in the educational movement, and who was quite the main mover in starting the examinations which it was now necessary for any gentleman to pass who wished to become an Associate of the Institute—had left the Institute under his will the sum of 1,500*l.* for the benefit of the Institute. While deeply deploring Mr. Cates' death, they must all feel grateful to him for remembering them in his will.

Mr. Graham said that, in continuation of what the President had announced, he had the pleasure to state that the Library had also benefited from Mr. Cates' thoughtfulness and kindness. Under his will Mr. Cates had bequeathed to the Institute 215 volumes from his library. The books were, more or less, well-bound, and the Literature Committee had come to the conclusion that, in cases where there were duplicates already in the library, the books presented by Mr. Cates, which were in such good condition, should be placed in the reference library, and the duplicates in their own library should be put in the loan library. They were all anxious that the loan library should be extended, so as to be useful not only to allied societies, but to all members of the Institute. They were hampered in their space, but that difficulty would be overcome in time, he hoped. They were much indebted to Mrs. Cates for her kindness, and for the manner in which she had

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carried out the wishes of her husband. She had added to the bequest a number of prints, and had kindly presented one of Mr. Cates' bookcases. He desired to move that the best thanks of the Institute be forwarded to Mrs. Cates for her great kindness and consideration in carrying out the wishes of her deceased husband.

Mr. R. Phené Spiers, Chairman of the Literature Committee, seconded the motion. The collection was a large and valuable one. Mr. Cates was a great collector and a great reader, and the books he had presented were of the greatest possible interest.

The Glasgow Visit.

The vote of thanks having been heartily agreed to,

Mr. John Slater said that since the last meeting many of the members of the Institute had participated in one of those provincial meetings which were started some time ago and which enabled them to hold their annual dinner with one of the allied societies. Many gentlemen had had the privilege of going to Glasgow, where they were loyally entertained; and he thought the Institute would like to pass a vote of thanks to the various societies in Glasgow who entertained them so well. The Glasgow Institute, whose President, Mr. Burnet, they had with them that night, could not have done more than they did to make the visit to Glasgow a pleasant one. They entertained the members at a most *recherché* luncheon at the Exhibition, and the members of the Glasgow Institute were most anxious to put their services at the disposal of the visitors. Then the Glasgow Corporation gave them a most charming entertainment at the Town Hall, which all of them enjoyed to the full. The University invited them to visit that building, and they had a most interesting meeting there, and saw the buildings, and were delightfully entertained by Principal Story. To the Glasgow Arts Club a special vote of thanks should be accorded, for they gave the visitors a pleasing invitation to be free of their club, and did much to provide entertainment for them, and to the President of that club, Mr. Christie, they were extremely indebted for two most enjoyable evenings. The Imperial Union Club also made the visitors free of their rooms, and the Royal Scottish Society of Painters in Water Colours gave permission to look at the pictures in their galleries. It would take too long and it would be out of place to go into details as to the buildings of Glasgow, but the members who saw the Arts Club would feel that at any rate skill and originality were two great features of Glasgow architecture. He asked the meeting to pass a very hearty vote of thanks to the bodies he had mentioned for what they did in entertaining the Institute on the occasion of the visit to Glasgow.

The Chairman said the Glasgow Corporation most regally entertained them in the Municipal Buildings and provided musical entertainment and refreshments in several rooms, and altogether treated them most hospitably.

The votes of thanks were then heartily agreed to.

The Secretary, Mr. W. J. Locke, stated that on October 24 and 25 an examination qualifying for candidature as District Surveyor in London was held, and Mr. C. O. Nelson, of Chiswick, passed. He had been granted a certificate of competency to act as District Surveyor.

It was also announced that at the Institute examination held in Montreal last June (the first held in the Colonies) Mr. Andrew Sharp was successful in satisfying the examiners, and he has become qualified for Associateship of the Institute.

President's Address.

The President then delivered the following address:—

Colleagues, Ladies, and Gentlemen,—I had occasion, in my two former addresses from this chair, to take a retrospective view in the one of the architecture of the past century, and in the second to consider what might be the state of our art during the coming century. This year I shall but glance at certain current points which seem to me either important or of interest.

First as to the increase of the numbers and influence of the Institute. Our numbers, I am happy to say, maintain a steady increase, and each year more candidates present themselves for examination than on previous occasions. We have, in fact, some 1,700 actual members of the Royal Institute of British Architects—or over 3,000 members, counting those of societies in alliance with us. There are also some 1,500 probationers, and more than 400 students, which is some proof of the value set on the Institute examinations and the trend towards improvement in education of architects. I think this speaks very well for our increasing prosperity, so far as it can be told by figures. Unfortunately, though our numbers steadily increase, death has recently made dreadful inroads on our members, for since this time last year we have lost twenty-one Fellows and five Associates. It is sad to find that amongst this number have been some of the greatest and most honoured names. The roll includes Barry, Burnet, Brydon, Brooks, Cates, and Young; and many of the number were carried off while in the prime of manhood and busy in harness—two of them just as they had achieved the honour of being appointed to design and carry out two of our greatest public buildings. Truly we must feel that in the midst of life we are in death. Their loss we all deeply deplore.

That the influence of the Institute is growing and not waning is shown by the number of instances in which it continues to be appealed to on architectural questions by public and other bodies, both in the metropolis and provinces, and the number of congresses and other meetings to which we are asked to send representatives and invited to express our views. There can be no doubt that if the Institute would only let its voice be heard on important points in respect to architectural questions as they arise, whether they be metropolitan improvements or other important schemes, we should, and ought, gradually to become the guiding spirit in such matters.

While touching on this point of metropolitan improvements and large architectural questions, I suggested last year the advisability of some more organised system of control over design. Whether it were by a Ministry of Fine Arts, as proposed by me, or by a Royal Commission, as has been suggested since both by the President of the Royal Academy and Lord Wemyss, is of little matter so long as the responsibility were fixed. The discussions and very varied opinions expressed in the *Times* and other journals on such a question by writers qualified or unqualified to judge seems proof of the evident necessity for some such organisation. In America, at Washington, the same suggestion is being urged on the Government.

It has been stated that the widening of Piccadilly was only a part of a large improvement scheme for that particular approach to the City from Kensington, in which the taking down and rebuilding of Walsingham House would afford an opportunity for a move in that direction. Whether this is so I have no knowledge; but the question I would ask is, Why deal with only one small portion of London at a time? The whole question of the rebuilding of London, enormously difficult as it may be or the huge expense it may involve, ought now, without further delay, to be considered. Definite improvements and building lines should be laid down in all important directions, and all buildings pulled down and rebuilt or altered in the future should be obliged to conform to the scheme. It would mean increased expense to the ratepayers as each portion of ground was taken by the authorities for the widening or improvement of the thoroughfares; but it would be a gradual work, and, though slowly, London would at length be rebuilt on a properly considered plan, instead of an improvement here or a widening there being effected without relation to any well-considered inclusive scheme covering the whole problem.

And I would reiterate what I said last year as to the necessity for providing subways to avoid the constant taking up of the roads. I am glad to see that five parishes have raised an indignant protest against the ever-recurring interruption to traffic by street excavations, and that the attention of the London County Council has been drawn to the matter.

Since writing the above, I see that the Highways Committee of the London County Council will submit at the next meeting of the Council a report advocating the construction of a system of shallow underground tramways in London, with subways for pipes, wires, &c., on each side of the tramway subway, and that the experiment should be initiated in the new thoroughfare in course of construction between Holborn and the Strand. This is a step on a most important matter quite in the right direction.

The consideration of the questions of the insanitary effect of large areas overcrowded by a dense population in flats, the shutting out of sun and air, arcades over footpaths, railway works in the metropolis, sites for workmen's dwellings, &c.—these are a few of the many questions entering into any scheme of improvement, as well as the embellishment of the metropolis by its public buildings, and they should be dealt with by the Ministry or Commission to which I have referred. If we do not wish future generations to hold us up to scorn and blame us for our culpable apathy, it is time that Parliament took some step in the direction indicated.

I must again this year refer to the question of competitions. A great deal has been written of late in some of the journals on the subject of Assessorships in Competitions, and evidently without knowledge of the truth of the matter or troubling to ascertain it. The suggestion has been that the blame of the dissatisfaction so constantly arising as to awards lies at the door of the President or Council of the Institute for not having exercised sufficient care in the selection of assessors. I have therefore had a list made of the competitions held since July, 1899, up to September last, with the assessors' names and the results—that is to say, as to whether there has been any expression of dissatisfaction in regard to their awards—and the following is what I find to be the case.

There have been during this period, as far as I can find out, ninety-seven competitions held in all parts of the country and metropolis. Out of this number there were seventy-three in which the authorities chose their own assessors, or, at any rate, did not apply to the Institute to name one. Out of these seventy-three the assessors' awards were set aside and dissatisfaction was expressed in twelve cases, or practically, one in every six competitions. In the remaining twenty-four the President of the Royal Institute of British Architects, or the Council in a few instances, nominated the assessors, and in not a single instance was the award of these assessors set aside, nor can I find that any expression of dissatisfaction arose at their awards. There was only one case in these twenty-four where any unpleasantness at all rose, and that was solely on the part of one person out of sixty-two competitors for the same subject, because a certain alteration had been made in the conditions by the assessor, who was appointed a week or two after those conditions had been issued by the authorities. As it apparently made no difference to sixty-one out of sixty-two competitors, it could not have been of serious importance, and there was no dissatisfaction expressed at the assessor's award.

I think this proves how ready some even of our own members are to blame either the management or the officials of the Institute when they do not even know the facts about which they are writing or talking. A little more loyalty and real honest endeavour to serve the ends for which we are all supposed to be united and working would be more to the point, and assist materially the work of the Institute for the good of our art and the profession at large. And on this I must quote and adopt some words of Mr. Peabody's in his address to the American Institute: "We can only measure the amount of good the Institute has done by its output. Many a man who cares little for it benefits because others have cared. Many a man outside our numbers is more respected in his community, and has a more certain livelihood, because the Institute has proved itself a reasonable public body. Certainly through its influence the perils and hardships of competitions have been greatly mitigated. But all these are small and selfish ends. The real value of the Institute lies in its opportunities, in its openings for useful work and mutual high endeavour. Thanks to the wisdom of its founders, I think it has been a potent means of good. Thanks to them, it has none of the features of a selfish trade union. In a trade union a man's powers and skill are handicapped for the general good; but with us a member has entered into no engagement of any kind except that he will honourably practise his profession."

This examination of the result of the enormous number of competitions in a couple of years only is enough, I should think, to deter most men in the profession from taking part in them; but if not—and we choose to have it so

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—we should bear in mind that in every competition the larger proportion of the competitors must naturally feel disappointed, as there can only be one winner; and if a man does not care to take this risk he should not compete. As I said last year, one can only endeavour to nominate the right man as assessor; but even he is hardly likely, however level-headed, careful, and just in his perceptions he may be, to please every one. Anyhow, if the public continue to lay the burden of competition on the profession, and we prefer to bear this burden of enforced gambling, then at least let us be fair amongst ourselves, and insist that nothing shall upset the principle we have long ago laid down—that when a duly qualified assessor has been appointed, and has selected a particular design, the author of that design shall, unless there be some very special reason to the contrary, be employed to carry out the work. Otherwise we are simply playing into the hands of an unscrupulous public, prepared to take every advantage of our time, talents, and money. Even should the assessor happen to make an award that does not commend itself to all, it will certainly be better for the profession in the long run that the award be upheld than that each dissatisfied competitor should endeavour to upset it. Our only safeguard is loyalty to uphold this principle.

Our Congress last year gave rise to a most interesting discussion on bridge design, by the courtesy of the Civil Engineers at their institution. Whether it may bear fruit in the more intimate relations of the engineer and architect on the question of monumental bridges in the metropolis and provincial towns remains to be seen. The architectural effect of bridges must be the outcome of the construction at the inception of the design, and can scarcely be added as a dressing afterwards with advantage. It can, therefore, only be satisfactorily accomplished if engineers and architects would be willing to consult with each other at the commencement of any such scheme. Unless this be done, as the aim of the engineer is necessarily and properly, from his point of view, to construct in a purely scientific manner, usually omitting all that would add unnecessary weight or cost, the more such a purely engineering scheme is developed the more hopelessly ugly it usually becomes. The only way out of the difficulty appears to be for architects to study the subject of engineering for such schemes themselves, and, when opportunity offers, put forward their own views. Certainly, progress in the beauty of monumental bridge treatment may be made, if the designer will only remember at the outset that every idea in the design should be suggested by the construction, and that any ornamentation added for mere caprice certainly defeats its own object, if that object be the mere adding of unnecessary features as ornament to an already logical construction. Such friendly discussions as these between kindred professions cannot do otherwise than help in the appreciation of architecture as appertaining to engineering, and clinching the theory that architecture and engineering should go hand in hand as helpmeets the one to the other.

In speaking last November, from this Chair, of the problems that the architecture of this century is likely to have to solve, I mentioned as one the planning of large churches to meet the needs of modern congregations, with a view to avoid the blocking of the central portions of churches in the mediæval manner of our Gothic cathedrals. I wish to-day to go a step farther on this point, though I do so with some diffidence, because any suggestion of alteration in our accustomed church or cathedral arrangements is looked on by many as almost heretical; but what I may say is with a view possibly to induce, at some later date, a discussion on the point I am going to raise—namely, that of bringing altars forward, nearer to the congregations than is possible with the present arrangement of deep chancels and choirs. Such a discussion might be very interesting and instructive from the architectural side of church arrangement, as well as in relation to the question of congregational worship in our larger churches.

In 1884 I wrote in one of the building ournals some thoughts on church planning, the object of which was to show that the common fourteenth-century plan, with the crossing blocked by large piers and the enclosed choirs in the centre of the church, though well adapted for the mediæval and monastic times, is quite unsuited to modern worship in the nineteenth century. This view now seems generally accepted; but further than this, the fervent spirit that has developed itself under the Church revival of late years renders it necessary that the large congregations should be able both to hear and see all parts of the services for full participation in them.

Beresford Hope, in his "Worship and Order" (written many years before his death, but still, I am assured, expressing his latest views, for he presented copies of this book to friends shortly before he died), says:

"I tell the man who wants to build a church, which shall be at once useful and beautiful, to forecast that church in his mind's eye, to forecast it at work—full of worshippers joining in the 'Te Deum,' upon their knees at the Holy Communion, of worshippers listening to the evening services. Let him guess, as he only can, by such a glance how every one can hear and every one can see. Let him notice where his light falls, and where it is darkness, and in particular let him make sure that the altar and its adjuncts stand well forward, and are not lost in the obscurity of some unlucky shadow. There is no reason, beyond the prejudice which such a novelty might excite, why at times one should not construct a circular or polygonal nave. The nave of the Temple Church is precedent enough, and the glorious decagon of St. Gereon at Cologne would hold a goodly multitude. There are no more congregational naves anywhere than the octagon at Ely and the dome of St. Paul's."

All which means that what is wanted now, and much more now than when the above words were written, is a large open space for worshippers, with the altar brought well forward, and not buried in the depths of a lengthy chancel or choir, as in the case of the fourteenth-century English cathedrals, of which type the new one at Truro is a modern representative, and, however good in its architecture, is simply an anachronism.

Tradition and conservatism are well in their way, but should not go the length of hampering modern requirements with obsolete arrangements made for the benefit of colleges of monks, and not for the people. The desirability of a good open space for congregational purposes is now by most thoughtful minds generally conceded. The point I would suggest for reflection is the possibility and propriety of a further advance in increasing the facilities of large congregations for seeing and hearing, and participation in those parts of the services conducted at the altar, by an alteration in its position, which might, while being a step in advance towards meeting modern congregational wants, possibly also be found to be, in a measure, almost a return to early usage. In a modern cathedral, say, for argument's sake, the choir must contain stalls and seats for seventy to one hundred persons, with proper space for altar communicants and steps. The length would be at least 100 or 120 ft., and though this is considerably less than the depth of many mediæval churches, it, nevertheless, removes the east end of the sanctuary so far from the nearest members of the congregation that it becomes practically impossible for them, as a body, to see or hear the services conducted at the altar.

The question I ask is, conceded the open space in the centre of a large church, why should we not consider the advisability in the future of altering the arrangement of our choirs and placing the altar at the entrance to the choir instead of at the east end, with the clergy, choir, and bishop's throne behind the altar? To see if there is any reason in such a suggestion let us look back at some points in the history of church planning.

The seats for the clergy being situated behind the altar is a far older arrangement than the position assigned to them in the mediæval and monastic times. It existed at first in some of our own early cathedrals, as you all know—at Norwich and Canterbury, for instance, I believe I am right in stating that the view of the Anglican party in the Church is that their rules, doctrines, and worship are intended to be in accordance with those of the earlier Church, and go back to the time before the Bishops of Rome established the Roman Church as the chief of all the churches, and arrogated to themselves the position of supreme head as Pope or Father. Now at this early period it is certain that the arrangements in the Christian churches provided for the altar being immediately in front of the congregation, and the seats for those who officiated at the various offices and at the altar being behind it. It is interesting to note how the earlier arrangements developed and were altered to meet the requirements of various times and peoples, and changes of thought.

Let us glance broadly at the various alterations that have occurred. In the early basilican arrangement, as in old St. Peter's at Rome and St. Paul's without the walls St. Apollinare at Ravenna, St. Clemente at Rome, both in the ancient and lower, and the later or upper churches, and later also at St. Ambrosio at Milan, Sta. Maria Maggiore at Rome; also at Torcello and Parenzo, and in the Armenian Church of Pitzounda, in the Coptic churches, and, as before mentioned, in Canterbury and Norwich, and also at the little early church of Deerhurst, it was evidently thought desirable that no great distance should intervene between the congregation and the altar, and for this reason no doubt it was placed in front of the Bema, thus bringing it in close proximity to the worshippers. In those days the form of worship was comparatively simple, and the officiating clergy, who probably acted as cantores also, were seated behind the altar, their seats being ranged around the Bema, with the Bishop's throne in the centre, and the worshippers evidently took full part as well as the clergy in the ceremony of Divine worship.

These altars, it is true, faced the reverse way to ours, and the priest officiated standing behind the altar facing the people and the east. Now both priest and congregation in our churches usually face eastwards or towards Jerusalem, perhaps originated by Solomon's prayer at the dedication of the Temple, though other reasons are more usually given for the custom. Some few centuries later, when, in consequence of the holy mystery of the Divine Sacrifice being more prominently suggested in the church arrangements, indicated by the veiled altars, the ritual had extended and comprised more ceremonial, and more attention was paid to music, the addition of a chorus cantorum or choir was made, intervening between the altar and the congregation and jutting into the nave. The clergy still occupied the same position behind the altar during the missa and officium divinum, but subsequently those in holy orders, as well as the cantores, occupied the lower portion of the choir during the officium divinum, and those only actively engaged in the missa occupied the Bema.

One evident reason of the choir being thus brought forward into the nave between the altar and the congregation in the basilican churches, as in the upper church of San Clemente and others, seems likely to have been, that had the increased number of singers been placed, like the priests, behind the altar, it would have necessitated in such a plan the position of the altar being moved some bays down the church, towards the centre of the nave, by which arrangement many of the worshippers in the large aisles would have found themselves during the missa behind the altar and the officiating priest, instead of in front.

It seems to me there could have been no other logical reason for the departure from the first method of arrangement, which brought the altar in greater proximity to the congregation; and from this departure by gradual steps our mediæval choirs were evolved, resulting eventually in the abbey churches in the entire shutting off of the altar, clergy, brotherhoods, and choirs from the congregations by the elaborate screens even now remaining in many churches both here and abroad.

The more exalted ritual, with its greater suggestiveness of the importance of and reverence for the holy mysteries, aided by other Roman doctrines, seems to have led to the screening off of all those engaged in the service of the church from the congregations by the veiling of the altars, as in the Coptic and Eastern churches, by the iconostasis or solid screen which separated the altar from the choir, and also a further and more open screen which again separated the choir from the congregation. Instances of both these arrangements are found—of the first in the Church of Abu Sargah and the old Coptic churches of Egypt at old Cairo, in Russia and Armenia; and of the second in the upper church of San Clemente at Rome, and other early churches, and at Torcello; and possibly some such similar arrangement was adopted at old Canterbury and Norwich, and the little ancient church of Deerhurst.

Again, later on in mediæval times, when civilised but pagan Rome had fallen, and education for the masses had disappeared, the Church being the only light of the dark ages, and the Bishops of Rome had added worldly pomp and power to the spiritual character of their office, and claimed for themselves the title of Pope as head or Father of the Universal

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Church, it was to be expected that the clergy and monastic orders should have conceived it necessary, considering the strong line of demarcation they had drawn between themselves, their elevated office, and the ignorant laity, to emphasise this point in their churches by altogether enclosing for themselves and occupying the central and best part of the churches and cathedrals. This was the natural evolution of the first enclosed choirs in the Basilicas placed between the altar and the congregation, and completed by the separation of the clergy and monastic bodies from the laity. This arrangement is familiar to us all in the numerous cathedrals with the enclosed choir or pulpitum. By this plan the congregations were debarred from any prominent or general joining with the clergy in divine service or public worship, excepting in connexion with the mass or services held at the altar which it was then found necessary to place in the nave, outside the choir, or rood screen, as was the case at Lincoln and York. These altars were for the popular services. There was a great screen between the western piers of the central tower, the altar in the middle and doors on either side. A necessity for this altar for popular or congregational services is felt at the present time in some of our cathedrals, as at Norwich, in consequence of the enclosed choirs still remaining.

In the early mediæval times, that the congregations should unite with the clergy in public worship was, judging by the arrangements then existing, apparently considered of small moment. The people were to be impressed, or perhaps improved, from a spiritual point of view: but their worship was done for them, if I may so express it, by proxy, "as in the Jewish sacrificial rites, when the priests and Levites acted alone, but with this difference, that in this case the people could not even join in the prayers and praise, as did the Jews, for the reason that the divine offices were not in the vernacular." It was when, later on, education, both religious and secular, caused an expansion of thought and feeling in the popular mind that an alteration was felt to be necessary; and it was the recognition on the part of the clergy for the necessity of the participation of the congregations in the whole of the services that caused the introduction of these second prominent nave altars in such proximity to the people that all could easily see and hear, and, at last, the holding of the services in the language of the people, as an additional aid to their heartily joining in them.

This principle of two altars is sometimes considered not in accordance with the feeling of the English Church, which it has been said is one church, one altar; but it seems to have been the outcome, first, of the desire for the separation of the clergy and choir from the congregation, and, secondly, of the basilican churches having first arranged the choirs intervening between the altar and the congregation. If the basilican churches—which, after all, were first derived from courts of justice—had had, instead of the Bema, long chancels or choirs to accommodate a large number of cantores, like the late cathedrals, is it not possible that the same relative position of the altar near the congregation would have been maintained, and the chorus cantorum have been placed behind it with the clergy, instead of in front of it? The fact that later on the nave altar outside the choir were found necessary seems, to my mind, to argue that it would have been so.

In Spain in the fifteenth century the arrangement obtained of the *coro* or choir being placed in the nave and the altar in the eastern part of the church, with the congregation intervening between the altar and the choir. A modified form of this principle of arrangement is now to be seen at Westminster Abbey; and this plan was, no doubt, also the outcome of the feeling for the necessity of the altar being not too far distant from the congregation. There are also many instances now in Italy of the choir being behind the altar; but in some of these cases the public are brought too near the altar, which seems somewhat derogatory to reverence, as in Sta. Maria del Fiori, at Florence, where the high altar was placed under the dome, and the congregation entirely surrounds it. At Sta. Maria Maggiore the altar is still at the entrance of the Bema in the nave, and the choir and stalls for priests behind it on either side of a second altar at the end of the apse or Bema; and a somewhat similar arrangement exists in the semi-Romanesque churches of Cologne and St. Gereon, thus bringing the altars in proximity to the congregations.

Does it not seem evident, from these variations at different times of the arrangements made to suit the feelings and education of the ages, that there can scarcely be said to be a hard-and-fast line drawn, or any grave law that would be broken if the present plan of accommodation of our tripartite arrangement of congregation, choir, and sacrarium, were somewhat altered to meet modern requirements, however much, in some respects, our sentiment and conservative feeling make us averse to alterations?

The present arrangement, when we consider the late earnest Anglican movement, which claims to go back in its faith and ritual to the period previous to the absolute sway and domination of the Roman Church, seems in some respects to be wanting and illogical, where, as in our larger churches and cathedrals, large choirs and numbers of clergy have to be accommodated, causing, by this plan, the altar to be removed from the congregation, say from 80 ft. to 150 ft., and suggests the necessity for some revision in our plan which shall, as in the early times, bring the altar and the services conducted at it in closer proximity to the worshippers.

I quite feel that difficulties arise which are not easy to surmount in the suggestion of the principal altar being placed at the entrance to the choir, but I do not see that they are insurmountable. First, there must be the elevation of the choir above the nave, and then of the sacrarium and altar above the choir; but with a wide choir, and a large open space in front, I do not see that this would be impossible any more than at Sta. Maria Maggiore in Rome, or at the Duomo in Florence.

Also there is the question of a great reredos, but a canopied altar and a dossal of beautiful workmanship and precious and rare materials might be infinitely more satisfactory and in better taste than some of the large and elaborate altar-pieces of soft stone and inferior sculpture and workmanship that have been erected in many of our churches in late years. One objection, no doubt, that would be raised to such an arrangement would be, that by the present plan we are supposed by degrees to arrive at the holiest of all at the altar, which, therefore, is removed furthest from the vulgar; but the Roman Church has evidently not attached weight to this, and why should ours? A second altar might be placed at the extreme east end and used for smaller services, the bishop's throne and the choir and stalls remaining in the same relative position as at present. With the enormous congregations our churches are now attracting, width of nave and choir and spacious interiors are a necessity, and with these, were it found advisable, this arrangement could, I imagine, be made to suit our worship as easily as the Roman Church has, in numbers of instances, made it suit theirs.

As to its advisability in regard to sentiment and conservatism, no doubt many adverse arguments could be raised; but, all the same, the question would still remain of the vital necessity for fervent worshippers being able to see and hear and join in all parts of Divine worship. The subject has been in my mind for a number of years, which must be my excuse for bringing it before you on this occasion, and, after all, it is as much an architectural question as an ecclesiastical one. At any rate, I am not the first to have proposed such a thing, and numbers besides myself are interested in the subject. I would commend the point for consideration to any of you who may be likely to have the chance of erecting a large church or cathedral suited to modern times.

Gentlemen, this is the last time I shall have the honour of addressing you on the first day of a new Session, and I can only conclude by once again saying how greatly I feel the honour you have conferred on me and the confidence you have reposed in me by again electing me as your President, and I assure you I shall continue, as I have ever endeavoured to the best of my ability, to do all I can to further the interests of our noble art, to extend the influence of this Institution, and to uphold in the highest sense, as far as I am able, the dignity of our profession. To these ends the Council are ever ready to give their unqualified aid, and I only ask you all to loyally join with us in our endeavours.

Mr. J. Macvicar Anderson, in moving a hearty and cordial vote of thanks to the President for his able and interesting address, said it was pleasing to all loyal members of the Institute, as he took it they all were, to hear from the head of the Institute of its prosperity, both as to numbers and in regard to the influence which it exercised. Increased membership meant, of course, increased funds, and he referred to that in order to impress upon the Council again the advisability of allowing the surplus funds of the Institute to accumulate and not to be in a hurry to spend them. It was sad to know of the loss of well-known and valued members. In the case of Mr. Arthur Cates, no one knew better than he (the speaker) did what the Institute owed to him. Mr. Cates was not so much an architect as a surveyor, and yet he devoted his time, with indefatigable energy, to the interests of the Institute, and more particularly to the carrying out of the scheme of examinations, which had been so remarkably successful, and his memory might well be held in high regard by members of the Institute. It was sadly pathetic to think, too, that the two architects who, after much consideration, were nominated to carry out two great Government buildings had passed away, and it was pathetic, also, to know that a leading member of the profession had been laid aside for many months by serious illness. With the name of Alfred Waterhouse they had all been accustomed to associate an architect of great power and ability, and a prodigious worker of unbounded energy and activity. They could only hope that he would be spared for many years of usefulness, though it might not be of activity, and that in enforced retirement he might find that perfect rest and peace to which his active life so thoroughly entitled him. In regard to the widening of Piccadilly, the view he held was that it is too soon to enter upon such serious changes. It seemed a little unwise to begin by widening the widest part of Piccadilly so long as the narrowest part was allowed to remain narrow. There could be no doubt that in course of time underground communication in London would come more and more to the front, and he believed that, sooner or later, some such communication, similar to that on the north side of Hyde Park, would be constructed from the West End to the City. In saying that, he should add that he would oppose such communication being taken near the foundations of St. Paul's Cathedral; that was a scheme above all others to be avoided, but it did not seem to him that that feeling militated against this underground communication. If such a communication were made, and if the result were what the result of a similar communication had been on the north side of the Park, *i.e.*, to run the omnibuses off the road, then there would be ample room in Piccadilly for all other traffic. The best course seemed to be to wait, and not to go into extensive alterations which, as some thought, would ruin Piccadilly and which might be found to be ultimately unnecessary. As to the well-worn subject of competitions, many of the expressions of the President met with his entire approval. As to the "unscrupulous public," no doubt the public had become unscrupulous in what they expected of architects in the matter of competitions; but who was to blame for that? Not the public, but, in his opinion, the architectural profession, for no sooner was a competition announced than architects with great speed responded to the invitation to compete. He thought architects would better serve their own dignity and the welfare of the profession if they refrained from responding. He knew he was singular in that opinion, but he had never thought otherwise, and the older he grew the more he became confirmed in it. He was sure that the wisest thing for the profession to do in the matter was to have nothing to do with the burden the President had referred to, and if architects would refrain from so readily responding to invitations to compete the question of competitions would soon be solved. There was one competition which had occupied a great deal of attention lately, and that was the competition for the proposed cathedral at Liverpool. A great deal of nonsense had been written on the subject, and in his opinion the proper course for the Liverpool Committee to have followed was to have appointed the President of the Institute as the architect of the cathedral. Fifteen years since a competition was held and three eminent architects were asked to prepare designs. The late Mr. Ewan Christian was

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appointed assessor (and no man had more sound judgment in such matters), and after much care he selected the design sent in by Mr. Emerson. It was true the site had been altered and the circumstances changed, but those were not sufficient reasons why the great labour and thought given to the matter by Mr. Emerson should be set aside. The President had devoted the greater part of his address to a subject which was of great importance, viz., the plan of modern churches. There could be no doubt that the mediæval plan of our modern churches and cathedrals were not suited to the worship of the present day, but at the same time the mediæval arrangement gave a wondrous charm and attraction to churches and cathedrals, and if that charm and attraction were to be lost by adopting a different arrangement, one would hesitate a long time before adopting it. It was a subject which had very properly been brought forward for the consideration of architects. As to the position of the altar, there could be no doubt what the origin of the idea was, for the Saviour dispensed the first communion on earth with his disciples all sitting at one table. Therefore, the idea of placing the altar at the most remote part of a long chancel, away altogether from the congregation, was certainly not confirmed by the primitive and original idea of communion.

Mr. G. H. Fellowes Prynne, in seconding the vote of thanks, said that when a President had to address an Institute like theirs three times, the difficulty was more than threefold. The two previous addresses were not only able, but more full of life and vigour, and were thoroughly practical, and yet elevating in their tone, and could be read with pleasure and profit. The present address was somewhat more limited in scope, although it dealt with matters equally practical. As to the losses the Institute had sustained by death, he felt that most of them must have felt the blank which the loss of many well-known men had caused. He thought it would be an excellent thing if the Council would consider the possibility of making arrangements for the exhibition in that room of works of deceased architects. It would not only keep green the memory of dear and departed friends and confreres, but would be of great value to members individually, and would help to popularise the meetings in that room. As to the subject of improvements in London, the rebuilding that the President suggested was, indeed, a large matter ; to him (the speaker) it seemed almost hopeless. No sooner were our streets widened and buildings of ugliness were pulled down, than some fresh Goliaths were erected more hideous by their size or self-assertiveness than the former buildings. It seemed difficult to suggest any plan which would be satisfactory for the improvement of London. At the same time, as to the proposed Ministry of Fine Art, similar power had been granted in other countries, and certainly the improvement in art in the streets of those countries had been very great indeed, and a similar body, if truly representative of the art of the nation, might be of immense service both to the nation and the profession to which they belonged. As to competitions, he thought the Institute ought to be grateful to the President for having gone so fully into the matter as regards the assessors the Institute had named. He thought that would show members outside that the Council were thoroughly interested in getting absolutely fair play in competitions. He could not help referring to the great competition for the Liverpool Cathedral. He thought the President had a right to complain that he had been unjustly and unfairly treated, for the fine plan he sent in in the last competition was assessed as the best plan, and consequently the President ought to have been appointed on the present occasion. The lapse of time and the alteration of site seemed to him to make no difference, and the President ought to have been asked, at least, to send in a fresh scheme, even if the Committee would not bind themselves to accept it. Such an appointment would in no way have been regarded with jealousy or disapproval by architects generally, and it would have been welcomed by members as a compliment to the President and the Institute. In reference to the longest and possibly the most important part of the President's address, he should like to have gone into the subject in detail if it had been a paper on church planning.

The President, interrupting, said it was his idea that the matter would lead to discussion on a future occasion.

Mr. Prynne, continuing, said that the subject was of great interest, and all who planned churches must feel that there was enormous scope for much improvement in planning ; at the same time, everyone would recognise the great difficulties which existed in making radical changes in what were accepted as the principles of church planning, and although he most thoroughly endorsed the hope that our church plans might be in a sense more logical and, perhaps, more common-sense, he felt that the matter was full of controversy and side issues. Properly to build a church, the object must be something far higher, better, and nobler than that of merely seeing and hearing. We did not want our churches to become mere preaching houses or music-halls ; something higher in their design was wanted. They must design in a devotional sense in their church architecture, so that every stone and the proportions would preach better sermons than the spoken discourse. The all-seeing and all-hearing idea should not be the main idea in church planning, though, of course, it should be incorporated in church planning.

Mr. Anderson then put the vote of thanks to the meeting, and it was heartily agreed to.

The President, in reply, said, as to Liverpool Cathedral, he was grateful to them for their expressions, but he thought that some of the remarks which had been made were too strong. The present committee who had the subject of the cathedral under consideration were not all the same gentlemen who formed the last committee, and no doubt some of them thought that architecture made great advances in the course of fourteen or fifteen years, and that by having a fresh competition they would get a better design. He would be delighted if, by dropping any claim he had, they got the finest cathedral. He had been disappointed in the matter, but long ago he felt that the cathedral was almost *in nubibus*, and he had not expected it to come up again in his lifetime.

The meeting then terminated.

The next meeting will be held on the 18th inst., when Mr. R. Anning Bell will read a paper on "Mosaics."

THE ARCHITECTURAL ASSOCIATION

An ordinary fortnightly meeting of this Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, W., Mr. W. H. Seth-Smith, President, in the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the Association :—Messrs. A. C. M. Edwards, E. F. Knight, W. H. Hillyer, H. Bailey, J. H. Gott, A. G. Parker, H. L. Samson, B. B. Hooper, W. J. Parker, J. H. Belfrage, C. J. Calder, J. C. Corblet, J. H. Crabtree, J. J. Crowe, L. H. Harrington, A. J. Healey, D. S. Jennings, H. A. P. Pierce, L. Roberts, S. H. Stock, F. A. Stowell, T. J. Tatham, T. Thorne, G. F. Webb, A. B. Botterill, W. B. Sinclair, E. Chaplin, R. B. Curwen, M. E. D. Dixon, J. V. Gibberd, Norman Hall, C. R. G. Harrison, C. McJerrow, H. Kemp, C. U. Kilner, D. M. O'Connor, A. E. S. Payne, P. Phipps, G. A. Potts, F. G. Russell, S. M. Spoor, E. G. Stevenson, R. W. Stuttle, W. J. Tomlinson, W. I. Travers, C. F. Ward, R. H. Willson, and B. H. Sutton.

Mr. R. S. Balfour, Hon. Secretary, proposed a vote of thanks to the Rotary Photographic Co. for the gift of some excellent photographs of ancient Rome. The motion having been agreed to,

The Chairman said that, owing to Mr. A. T. Bolton's appointment as Headmaster to the Day School, a vacancy had been caused on the General Committee of the Association, and in accordance with By-law 35 he gave notice that at the next ordinary meeting of the Association the Committee would nominate Mr. W. C. Waymouth, who, of the unsuccessful candidates, received the highest number of votes at the last election.

Cambridge in Early and Mediæval Times.

Mr. A. Wood, M.A., F.S.A., then read the following paper on "Cambridge in Early and Mediæval Times:"—

Some three miles from Cambridge the Gogmagog Hills rise above the surrounding country. The name is supposed to be a corruption of Hog-Magog, from Hoog-Macht, or high strength. From them a good view may be obtained over the plateau upon which stands Cambridge. At this spot we are amid the defences which the East Anglians raised or utilised against their encroaching neighbour Mercia. Across the Cam there is some elevated ground, and one catches a glimpse of the majestic minster of Ely. The hill to the north is the Castle Hill at Cambridge. Elsewhere one looks over land nearly as level as the sea which borders it to the east. We are here in the territory of the Iceni, which comprised what were afterwards Norfolk, Suffolk, and Cambridge. Middlesex and Essex belonged to the Trinobantes. Part of Cambridgeshire may be said to have hung on to Norfolk and Suffolk, and was defended on the west by the great Whittlesea Mere. The ground on which we are standing would have become a debatable land if it had not been strongly fortified on what may be called a trench-and-blockhouse system, the indications of which may be traced at the present day. The Great Dyke known as the Recken Dyke, the Devil's Dyke, St. Edmund's Dyke, extended over Newmarket Heath from Reche upon the Cam towards the woods of Essex. Water was the protection at one end, wood at the other. Parallel with the Great Dyke, at a distance of seven miles, was the Fleam Dyke. This began at Fen Ditton on the Cam below Barnwell, which is suburban to Cambridge, and ended at Balsham, to the south-east of the Gogmagog Hills. According to Dr. Mason, another dyke, starting about a mile south of Bourne Bridge, between Abington and Pampisford, trends towards Cambridge. This was probably for the protection of Worsted-street, a Saxon line of road which runs close beside the Gogmagog Hills.

Dyke means both ditch and mound. Scotchmen and North-country Englishmen still call a wall of whatever material a dyke. According to Palgrave, the name Rech or Recken Dyke does not come from the village of Reche, but means the Giant's Dyke, from a root found in Eastern and Western languages alike—as in the Latin *rex* and the Indian *rajah*, in the Anglo-Saxon *rican* and the common English *rich*, in the Castilian *ricos* and the Scottish *king-ric* for kingdom, and, it may be added, in the English bishopric. Still the village of Reche may have had the very same derivation. It is a poor, out-of-the-way place now, but tradition says that it was once a great city divided into four quarters, one of them inhabited by Jews.

Exning was the capital of Anna, King of the East Angles, with whom dwelt, until their departure into Kent, his daughters Ethelburga and Sexburga, and, until her marriage with her first husband Tonbert, Etheldreda, foundress of the Abbey of Ely.

Tonbert, one of the nobles at the Court of Anna, was an alderman, or, according to some, a prince of the Southern Girvii, one of the two peoples—the other being the Northern Girvii—that formed districts of the East Anglian kingdom. The Southern Girvii occupied the whole Isle of Ely.

On the summit of the Gogmagog Hills is a triple circular entrenchment enclosing about thirteen and a half acres, known as Vandlebury, which is, according to Gough, one of a chain of forts. The first is at Audley Inn in Essex, the second at Littlebury in the same county, the third at Chesterford to the south of Cambridgeshire, the fourth is Vandlebury, the fifth Granchester, the sixth Arbury, from which *castrum* or camp Chesterton, near Cambridge, derives its name ; the seventh Belsars Hill, near Willingham, ten miles to the north-west of Cambridge. All are in sight of one another, and they reach from the woodland of Essex to the Fens, their line being crossed by several parallel ditches, both forming what I have called a trench-and-blockhouse system. The camps themselves were British or Roman, but they availed to defend the kingdom of the Uffingas or descendants of Uffa, the kings of East Anglia.

But it is time to leave the Gogmagog Hills, which Henry of Huntingdon calls "the pleasant hills of Balsham," and follow the Roman road, a portion of which is the Worsted-street of which I have spoken, to Cambridge. It may be well, however, to state here that the next fort to Vandlebury mentioned by Gough, that of Granchester, is a well-marked Roman encampment. Here there was evidently an extensive cemetery, as many ancient coffins are still to be seen built into the walls of the church and churchyard. Granchester appears to have been deserted at an early date in favour of Cambridge, with which it has often been confounded. We cannot doubt that it, and not

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Cambridge, was the place to which Sexburga, sister of St. Etheldreda, foundress of Ely, sent for a coffin to enclose the remains of her sister. "The brethren whom she sent," says Bede, "took ship and came to a certain ruined town at no great distance [from Ely], which in the English tongue is called Grantacestir; there presently they found hard by the walls a white marble coffin, exquisitely wrought, with a lid of the same material." It seems safe to assume that this indicates the Roman cemetery at Granchester.

In the declaration of the laws of the Guild of St. Mary, Cambridge, written in Anglo-Saxon, and to which a very early date is attributed, Cambridge is written Granta-brycge, and not Granta-byrig, otherwise one might have thought that it really meant the town upon, as Granchester is the camp upon, the Granta. The mediæval name is therefore the Bridge upon the Granta.

Granta and Cam are quite dissimilar. Cam, which is familiar to us in the word *camber*, is found in Camboritum, the Roman name for Cambridge. Camboritum is explained as the ford at the bend, the sharp curve which the river makes below the Castle Hill at Cambridge. Camboritum was, however, properly the Castle of Cambridge, not the existing, although ancient, town. Rhedum (ford), the other constituent with Cam of the name, is found in Rhedycina, the Latin name for Oxford. Ox represents such names for water as Esk, Usk, and Ouse, the last of which has been Latinised into Isis. It was only gradually and at a very late date that Cambridge supplanted the mediæval Grantabridge.

The outline of the Roman Camboritum can be readily and clearly traced. The western wall went from what is known as Mount Pleasant, and, enclosing the little Church of St. Peter and its churchyard, ran to a point near the old Norman Grange, known as the School of Pythagoras, where the southern side began, and crossed Magdalene-street by the south side of the Chesterton-road, the terrace in Magdalene College grounds forming part of the rampart. The eastern wall began a little beyond the college grounds and proceeded to Akeman-street, the Roman road, in the vicinity of the present Victoria-road.

The two roads that intersect at Camboritum are the Via Devana, running from Deva (Chester), from which it derives its name, to Camoldunum (Colchester). We have seen it as Worsted-street at the Gogmagog Hills. At Camboritum it is Magdalene-street; at Cambridge it has been Hills'-road, Regent-street, St. Andrew's-street, Sidney-street, finally Bridge-street. All this confusion might be saved by calling it from its terminus—Castle-street, the name actually given it beyond Magdalene-street.

Akeman-street is the Saxon name for the Roman road which ran from Brancaster, in Norfolk, by Cirencester, to Akemancester, the Saxon name for Bath. It seems that it must have coincided in part of its course with the Ikneild-street, which ran, also from Norfolk, by Camboritum to Old Sarum, Exeter, and the extremity of Cornwall. It would also seem that the Via Devana ran at some point into the Watling-street, which ran from London to Chester. There was another Roman road that ran towards Ely, and yet another ran near Granchester towards Bedford.

At the extremity of the natural promontory enclosed by, though not as extensive as, the Roman camp stands the mote or mound specifically known as the Castle Hill, which gives the popular name of Castle End to this outlying north-western part of Cambridge. It is also known as the Burg or Borough. It is partly natural, partly artificial. It appears to have been formerly considerably larger than now. East Anglia contains fine examples of these moated mounds. There are examples at Mileham and Buckenham; the finest example is Castle Acre in Norfolk.

The Danes were at Cambridge in 874, and the mound is probably a Saxon work undertaken at that date as a means of defence against those invaders. In the representation of the taking of the Castle of Dinan in the Bayeux tapestry the conical mound is surmounted by a timber construction which two men are endeavouring to set on fire with torches, whilst others are climbing up by a steep bridge which crosses the moat and ascends towards a gateway. Many mounds or motes of this description kept their wooden walls down to the twelfth and thirteenth centuries.

William the Conqueror erected a castle at Reche and another at Wisbeach. In 1069 he took up his residence in the Castle of Cambridge, whence he conducted his military operations against the Isle of Ely, where Hereward, the so-called last of the Saxons, maintained the struggle against him. William cleared away twenty-seven houses in constructing his castle at Cambridge, the previous one having been probably burnt along with the town by the Danes in 870 and 1010. The removal of houses was no doubt due to the construction of the base-court within the old Roman encampment, and not crossing the Via Devana. I need not pursue the not very eventful history of the Castle of Cambridge. The last remaining relic of the castle, the gateway, was pulled down almost in our own day to build the County Courts.

No less than three churches stood within the *enceinte* of the old Roman camp: All Saints', by the Castle, subsequently removed and the parish united to St. Giles'; St. Giles' itself; and St. Peter's. All Saints' was the only church within the castle enclosure. This was the arrangement at Porchester in Hampshire, Oxford Castle, and elsewhere.

In the essay on "Fairy Superstitions," in the "Minstrelsy of the Scottish Border," Sir Walter Scott relates from Gervase of Tilbury a legend connecting the camp at Vandlebury on the Gogmagog Hills with the Castle of Cambridge. This legend is said to be as old as the twelfth century, and is a specimen of the tales that circulated around the winter hearth of a castle at that period. It has further a topical interest as showing that, whilst the castle at Cambridge was occupied, Vandlebury was deserted.

In the neighbourhood of the Castle of Cambridge was, as we have seen, the so-called School of Pythagoras. This never was a school, and had nothing to do with Pythagoras. It appears to have been a farmhouse or grange of the twelfth or early part of the thirteenth century. The manor-houses of this period were usually in the form of a parallelogram, and of two stories in height. The lower story appears to have been invariably vaulted. There was no internal access from the lower to the upper story, the communication being by an external flight of steps such as we see at the King's School at Canterbury. In the upper story was at times the only fireplace in the building. Wealthy Jews appear to have been the first builders of stone houses in this country, as is seen in the Jews' house or houses at Lincoln and Moysey's Hall at Bury St. Edmunds. To the rooms above mentioned were frequently added a cellar on the lower and the solar on the upper floor. The kitchen appears to have been in a courtyard external to the mansion. The lower room of the "School of Pythagoras" is 60 ft. in length. The vault has disappeared, and there only remain two vaulting shafts. Light is admitted by an inserted fourteenth-century window of two lights. The windows on the first floor are fair examples of Transition work. This building was purchased by Walter de Merton, Bishop of Rochester, and bestowed by him upon his college in Oxford about 1270; hence the name occasionally given it of Merton Hall. It would almost seem as if he had at one time contemplated a collegiate foundation in Cambridge as well as in Oxford. It is a singular fact that Hugh de Balsham, Bishop of Ely, founder of Peterhouse in Cambridge, bestowed the advowson of the living of Gamlingay in Cambridgeshire upon Merton College, Oxford. It may be supposed that he did not at that time contemplate his own foundation of Peterhouse in Cambridge. The Oxford college thus derived a double benefit from what seems to have been a conflict of cross-purposes.

I have shown that there was a Roman road from Camboritum to Granchester. From Red Cross on the Via Devana a road ran westward, cutting the present Trumpington-road near Trumpington, and ran across the river, in which was a ford, to Granchester. There appears to have been a gradual concentration of population from the remoter parts of the area defined by the ancient road above mentioned towards the ford at the foot of the Castle Hill. This was the direction of traffic and commerce, and population followed it. This ford and the bridge that succeeded it must always have been of great importance as the only point at which goods and cattle could pass the river on their way from the eastern counties. It has been conjectured that the ancient Church of St. Benedict, remarkable for its Anglo-Saxon steeple, included throughout the mediæval period in Cambridge itself and well within its boundaries, was originally the parish church of a distinct village, overtaken by the growing town.

It has been said that Cambridge was, commercially speaking, never a very flourishing place. This appears to me over-hastily said. At Oxford the colleges have fairly strangled the town, or rather city, which in the early history was a commercial capital, and which one finds mentioned with London and Bristol. Cambridge has lost its commercial, but has retained its agricultural, consequence.

In the history and constitution of its Guilds we may read the record of its early unfulfilled promise. Guilds are of very early origin, and the English are the earliest. The Guilds were lay bodies, and existed for lay purposes. In the case of the three Guilds in Cambridge given in the return (12 of Richard II.) one altogether excludes the clergy, another prescribes that they are to have no part in its management, whilst the third has a chaplain, but with the condition that if the funds run too low to maintain both a chaplain and the poor brethren, the chaplain shall be stopped.

Two Guilds—those of Corpus Christi and the Blessed Virgin—combined to found Corpus Christi College. The Guilds themselves united and bestowed much of their property in houses upon the college. This excited the people of Cambridge, who, in 1381, instigated by the Mayor and led by a certain James of Granchester, a local Wat Tyler, plundered and destroyed the house of a University official, the Esquire Bedell, whence they hurried to Corpus Christi, broke open the college gates, assaulted the master and fellows, and seized upon the college charters and plate. They next went to the house of the Chancellor of the University, whom they constrained to subscribe two bonds, subjecting the University to the town, and engaging the University not to prosecute the town on account of these violent proceedings. The mob, after burning the University charters in the market-place, assailed Barnwell Priory and the Nunnery of St. Rhadegund, both of which had large possessions in the town, and the riot was only put down by the arrival of the Bishop of Norwich with an armed force. Dr. Keys relates in his history that after the burning of the University charters an old woman, Margaret Sterr, threw ashes—I suppose those of the charters—into the air, and shouted, "Thus let the learning of all scholars be confounded!" This amiable lady appears to have possessed an exuberance of civic life, and there is this to be said for her, that throughout the whole Middle Ages the colleges were thrusting themselves into and absorbing the most important region of the town, that adjoining the river, and were unpopular in consequence.

There were till lately several old houses in Cambridge, particularly in Bridge, Trinity-street, formerly the High-street, and the neighbourhood of the Petty Curry. The Jewry was in the parish of St. Sepulchre, and occupied a large part of All Saints' parish, including the site of St. John's College. The Synagogue and the house of Benjamin the Jew (afterwards converted into the Tolbooth) were not in the Jewry, but in the market-place, near the present Guildhall. Some have thought that the Jews did not live in the Jewry, but that is a mistake. As a matter of fact, they constructed numerous stone houses in and about the Jewry at a time when the majority of houses were constructed of wood. The presence of Jews in a town in such numbers as to have a special quarter assigned them is an evidence of its commercial importance.

I have referred to the Cambridge Guilds at an early date. At that time their ordinances were full and original. It is probably an evidence of the commercial decline of Cambridge that a very singular change took place in the fifteenth century. Nowhere else in England did, as in Cambridge, one Guild after another simply copy out the ordinances of an older Guild. Ordinances professing to be those of distinct Guilds, with more than forty years between them in the dates of their foundation, "are more identical in shape and words, so far as these could be used by separate bodies, than are the different versions of what are avowedly copies of the same by-laws."

The Cambridge charters have been published in the course of the present year under the editorship of Mr. F. W. Maitland and Miss Mary Bateson.

The churches of Cambridge would take a volume in themselves. To make the study of

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them intelligent one has to make a circuit of several miles round Cambridge, and even further than that at individual points, to trace their similarity to other churches in the same district. Thus what I have seen described as the singular tracery and form of the windows at St. Michael's, Cambridge, proves not to be singular when compared with that at Over, some miles to the north-west of Cambridge, which appears to be by the same architect or band of workmen.

I shall omit all notice of the most remarkable church in Cambridge, St Sepulchre's in the Jewry, as that is well known, and has been fully described as one of the round churches of England. I shall speak of those only which were connected with the colleges, and in doing so I shall take them in chronological order, as they existed in, and were part of, the town before the colleges were built.

The oldest church in Cambridge and the oldest building in the town is St. Benedict's, or St. Bennet's, Church. Its situation is slightly to the west of the site of the Austin Friars, and immediately adjacent to Corpus Christi College. The body of the church was restored by Mr. R. Brandon, and exhibits few traces of its remote antiquity. The tower, however, remains intact. It is of that version of Early Romanesque which we commonly call Saxon. It is in diminishing stages, not in one upright mass, as the tower of St. Michael's, Oxford. The material is rough masonry, the quoins being in "long-and-short" work. Of the three stages of which the tower is composed the lowest occupies nearly half of the entire height. The divisions are made by plain projecting string-courses. In the midst of each face of the belfry stage is a window divided by a central baluster standing in the midst of the thickness of the wall and supporting an abacus extending completely through the wall and bearing two semi-circular window-heads consisting of a single stone. There are smaller windows in each face set laterally to the larger ones, but on a higher level. The baluster shafts of the central windows are ornamented with a band of rudely-carved rings. The crowning member is a plain coping.

The tower of St. Bennet's communicates with the nave by a massive semi-circular arch having capitals adorned with roughly-carved representations of animals. Of the church contemporary with the tower only a few fragments remain built into the existing walls. The nave is of the thirteenth century. The original approach for the parishioners was by a porch, no longer existing, at the west end of the south aisle. The south aisle of the chancel is formed by a building that in mediæval times consisted of an upper and lower chapel, the former of which was used as a lecture-room. In the north wall was a window commanding a view of the parochial chancel. This building, deprived of many interesting features, is still connected with Corpus Christi College by a gallery supported by a four-centred archway.

The advowson of St. Bennet's was purchased by the founders of Corpus in 1350, and the Royal licence for the appropriation was obtained in 1352, but was not acted upon until a very late date. The college was in the parishes of St. Bennet and St. Botolph, one standing at one and the other at the other extremity of the site. The statutes of the college bound its members to attend service daily in one or other of the churches. A trace of the former connexion with the college is the monument in St. Bennet's of Richard de Billingford, Master of Corpus in 1398, who died in 1432.

Much the finest example of First Pointed in Cambridge is what is now, and has been since the early part of the sixteenth century, the Chapel of Jesus College, formerly that of the Nunnery of St. Rhadegund. It was erected between the years 1150 and 1245, the north transept being the oldest portion of the existing building. It was originally in the form of a cross, with a tower in the centre, and had, in addition to the transepts, aisles on the north and south sides of the eastern limb, flanking it along half the extent of its walls and forming chapels, which opened into the chancel by two pier arches in each wall. Of peculiar beauty are the piscina and sedilia; the series of lancet windows, with blind arcading between them, in the chancel; and the roof-story gallery on the inner side of the tower walls. The piscina was thought so beautiful that it was copied in the parish church of Histon, to the north of Cambridge, and in the ancient Hospital of St. John, where St. John's College now stands. The nave had seven piers on either side between it and the aisles. These piers were alternately cylindrical and octagonal. Upon this splendid fabric Bishop Alcock of Ely brought what was little else than ruin in transforming it into a college chapel. A considerable amount of his work has been undone in our own day, and there appears to be no reason beyond the expense that would be incurred to prevent the whole being brought back to its primitive condition.

The Cambridge example of the Second Pointed style is the fine Church of St. Mary-the-Less without Trumpington Gates, attributed to Alan of Walsingham, remarkable for its window tracery, and particularly for that of its east window, in which some see an approach to the Flamboyant character. The first church on this site was in the Norman style, and was known as St. Peter's without Trumpington Gates to distinguish it from St. Peter's by the Castle. The college was named St. Peter's from this church.

This church fell down about 1350. The actual Church of St. Mary was built as Merton Chapel or Church in Oxford to serve both for the college and the parish. It is a lofty body without aisles or any structural division between nave and chancel. The separation was effected by a screen. The length is 100 ft. and the width 27 ft. The church is divided into six bays, each of which, except the westernmost, is a double square in plan. It is lighted by lofty windows having between them deep buttresses. The tracery of the windows on the north side is all modern, with the exception of that in the easternmost window. In the eastern gable and in that on the south side are windows the tracery of which is exceptionally rich and flowing. The tracery is in the same style, and even from the same patterns, as that of the same date in Ely Cathedral. In the fourth bay are traces of chantries both on north and south, opening from the chapel by doorways and arches with rich complex foliation which formerly overhung monuments placed upon the line of the foundation of the wall. At the east end of the church is a vestry in two stories erected against the south wall of the easternmost bay, whilst against the next bay is an apartment or vestibule, entered from the south side of the choir. An ancient stone staircase leads from this vestibule to the gallery communicating with the college, so that the members of the community could use this as a private entrance. The floor of the vestry is raised upon a vault, which was used as an ossuary or charnel-house. The gallery connecting with the church is of the middle of the fifteenth century, at which date the choir was refitted. The new quadrangle of Peterhouse was built at the same time.

At St. Edward's Church the aisles to the north and south of the chancel belonged, that on the north to Trinity Hall, and that on the south to Clare College.

The south aisle of St. Michael's Church served anciently as the chapel of Michael House, one of the collegiate establishments on the site of Trinity College. The north aisle was the chapel of Gonville Hall. In this church was buried Hervey de Stanton, minister of Edward III. in 1337 and founder of Michael House.

St. Mary-the-Great is the University church. It has a lofty nave, with span aisles, and lighted by twenty windows in the clearstory.

One might be tempted to think on entering a college that the chapel was the most important building, the first built, and that all the other buildings had clustered round it. That is not the historical fact. The least ambitious part, the chambers, comes first. Originally chambers were lodgings in private houses, such as the accommodation—if such it can be called—for students in London or in the Scottish university towns. Next, larger or smaller bodies of students came to be entertained by a *host*, who furnished a common table, to the cost of which, however, each student contributed his own expenses. So we have *hostels* or inns. Some *hostels* were of sufficient importance to have parts of the parish churches appropriated to them. Then colleges came to build their own chapels, of which arrangement Pembroke is the earliest example in Cambridge. The chamber, the hall, the chapel—such was the progressive development. Eventually, with the exception of St. Mary's, the parish church ceased to enter into University life.

So also have monastic establishments. During the Middle Ages there were many monastic houses in Cambridge. The monks of Ely had one hostel, those of Croyland another, those of Norwich a third. Of the Friars, the Franciscans established themselves at Cambridge as early as 1224; in 1249 the Carmelites moved in from Chesterton to Newnham; in 1257 the Friars of the Order of Bethlehem settled in Trumpington-street; and in 1258 the Friars of Penitence settled in the parish of St. Mary-the-Great, whence they afterwards removed to the parish of St. Peter, where their buildings were eventually absorbed by Peterhouse. There were added to these at a rather later date (1273) the Friars of St. Mary, and two years afterwards the Dominicans. The Austin Canons had been for two centuries and a half established at Barnwell Priory, and the brethren of St. John's Hospital—also under the rule of St. Augustine—were established in 1135 by Henry Frost, a burgess of Cambridge.

Two Cambridge colleges, which fall without the mediæval period, Sidney-Sussex and Emmanuel, are built, the former on the site of the Franciscan or Grey Friars' house, Emmanuel on that of the Dominicans or Black Friars. The Carmelite house was situated between King's and Queen's Colleges; the Austin Friars near the site of the new museums; the White Friars of the Order of Bethlehem on the site of Addenbroke's Hospital.

The alleged history of the town and University of Cambridge in their early days is an impossible fable, and the account attributed to Peter of Blois, Archdeacon of Bath, is not history. Universities grew up from the episcopal and monastic schools. Something was wanted of wider range than their comparatively contracted teaching, and what became universities sprang up by the efforts of capable and enterprising teachers at suitable spots. Separate schools or colleges came in time to supplement the universities and to impart a more familiar and methodised instruction. This process was followed everywhere in Western Europe, except, indeed, in Scotland, where the students do not reside in colleges.

The word university is simply a mediæval law term for a corporation. When academical corporations were founded at Paris and Bologna they gradually absorbed into themselves the use of the word university, which had hitherto been common. The School of Bologna was called the University of Scholars, that of Paris the University of Masters, because in the one the students enrolled themselves into a corporation, and in the other the masters obtained for themselves corporate rights.

A college means properly a number of persons incorporated as colleagues for certain common purposes; the building is the house (*domus*), and hall (*aula*), and hostel (*hospitium*). The only buildings required by a university as such were a place to hold meetings and ceremonies, a library, lecture and examination rooms.

We know the appearance of the Cambridge schools in the middle of the fifteenth century. On the north side of the Quadrangle stood the Theology School, and on the west that of Canon Law, with the new library above it. To these on the south side were added the Schools of Philosophy and Civil Law. The whole building appears to have been completed in 1470 or 1471. The south building was entered by a vice or turret staircase at the north-east corner, known as the schools' tower and as the schools' belfry from containing the schools' bell. It formed part of the east range containing the gateway—still preserved at Madingley near Cambridge—which was begun in 1470. The east building occupied the space between the staircase and the Theology School. The entrance gateway had above its archway shields bearing the arms of England supported by lions, and those of Archbishop Rotherham of York. On the side towards the Quadrangle were seen the arms of Edward IV. and of Richard III.

These schools were the outfit of the mediæval University of Cambridge. They were confined to a single building. The colleges, on the other hand, were numerous. Still, they had a common character, so that we say now of a building that it is or looks like a college.

It has been argued that the dispositions of a monastery were derived from those of a Roman villa, and in particular from those that partook both of the character of the town and country house, and this resemblance has been worked out in detail. The cloister, with its

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pillars surrounding an open court having apartments opening from it, is, it has been argued, clearly derived from the peristyle common to the Roman town house and the country mansion, which was the part of the house reserved for private use. The outer court, with its stables, granaries, &c., corresponds with the *villa rustica* of the Roman country house. The *tablinum* becomes the chapter-house. The kitchen and refectory are in both cases situated on the outer side of the court. It is easy to press the analogy too far, but there is an evident truth in it.

So it may be said that there is between the general plan and disposition of a college an analogy with that of a monastery. The general enclosure within walls, the disposition into courts surrounded with buildings, the cloister, the refectory with its attendant kitchen and offices, the chapel (where it existed), the master's lodge corresponding to the dwelling of the abbot or prior, were similar to parts of the monastic structures or those occupied by the secular canons. The common dormitory, however, was a feature not reproduced, as the members of colleges slept in rooms or chambers, and were chamberers or chums. In Cambridge the chapel, the library, the master's lodge, and the great gateways of the later were wholly wanting in the earlier colleges. Even the disposition in a square or quadrangle was not at first attempted. The founder would purchase land and houses and accommodate them to the use of his college.

The colleges which fall within the mediæval period are fourteen in number.

1. St. Peter's, the earliest of the Cambridge colleges, was founded by Hugh de Balsham, Bishop of Ely, in 1284. He transferred to certain hostels on this site scholars whom he had previously placed in St. John's Hospital. He bequeathed funds which enabled his scholars to purchase land to the south of St. Peter's Church (now Little St. Mary's) and built upon it a handsome hall. The quadrangle was not begun until 1424. The buildings were then carried on continuously until about 1466. The north, west, and south sides were successively undertaken. The east side was still occupied by the original hostels.

2. Clare College was founded in 1326 by Dr. Richard Badew, Chancellor of the University, and was originally known as "University Hall." The college was founded anew by Elizabeth de Burgo, third sister and co-heiress of Gilbert de Clare, Earl of Gloucester and Hereford. This college does not appear to have been arranged upon the quadrangular plan until subsequently to the mediæval period. It is now wholly Renaissance, and the best specimen of that style in Cambridge.

3. Pembroke College is one of the four colleges founded in the middle of the reign of Edward III. It was founded by Mary de St. Pol, second wife of Aymer de Valence, Earl of Pembroke. The Earl died suddenly in France in 1324, when his widow became foundress of Denny Abbey, between Cambridge and Ely, and in Cambridge of a house of scholars with the name of the College or Hall of Valence-Mary, by way of jointly commemorating her husband and herself. The south side of the quadrangle was begun in the lifetime of the foundress, and the construction of the chapel—the first college chapel in Cambridge—was authorised by a Papal bull in 1355. The Countess had originally chosen another site for her college, and St. Botolph's Church was to have served as chapel. The very diminutive court at Pembroke is, with the exception of the building on the south side, of later date than 1351, when the site for it was obtained. Henry VI., in his charter, calls this "the most noble, renowned, and precious college, which, among all others in the University, was ever wonderfully resplendent."

4. Gonville Hall was originally erected on another site, and transferred to the present by William Bateman, Bishop of Norwich. The chapel, occupying part of the south side, was built in 1393; the chambers that complete that side and form the west side in 1441; the east side was not built until 1490. The chapel was built with its east end free, no buildings abutting upon it.

5. Trinity Hall has the peculiarity of an entrance court interposed between the quadrangle and the street, like the *curia* of a monastery. The quadrangle is larger than in any previous college—115 ft. long and 80 ft. wide. The founder, Bishop Bateman, is believed to have built the hall and the range next the street. The rest of the west range and the north range were added in 1374. The chapel is believed to have been built in the fifteenth century. Trinity Hall was a house of study for the Monastery of Ely prior to its conversion into a college for the study of civil law.

6. Corpus Christi College, built between 1352 and 1377, exhibits the first regularly-planned close quadrangle, as it has a hall range on the south, containing the hall, kitchen, and Master's lodge, and chambers upon the other three sides. The buildings are low and of equal height throughout. There was no chapel, but, as I have stated above, two parish churches, to either of which the students could resort.

7. The first stone of the old court of King's College was laid in 1441. The area was so cramped that the formation of a regular quadrangle could not be attempted. The first stone of the chapel for the enlarged foundation was laid in 1446. The design for the enlarged college was never executed, and the large southern quadrangle has sprung up in quite modern times. A closed quadrangle was contemplated, of which the chapel would have formed the north side; the west side would have been occupied by the library, the hall, and the Provost's lodge; the south and east sides by chambers. Westward of the chapel would have been a cloister, like Wykeham's at Winchester and New College, Oxford, with a lofty detached campanile.

King's College was founded by King Henry VI. in 1441 for a rector and twelve scholars. Two years later the King's plan was greatly extended and the endowment was made for a provost and seventy scholars. The college was not completed by either Henry VI., Edward IV., or Richard III., although both of the Yorkist kings contributed to this Lancastrian foundation, but by Henry VII.

8. Queen's College was founded by Margaret of Anjou, wife of King Henry VI., in 1448 for a president and four Fellows. The annual revenues amounted to 200*l.* a year, a sum of much greater purchasing value then than now. The principal quadrangle was completely designed and finished in a few years. It is entered on the east side, which, as also the south, is occupied by chambers. The hall, kitchen, and buttery are on the west side, whilst the original chapel and the library were on the north.

The first stone of the chapel was laid for the Queen by Sir John Wenlock, who was afterwards slain at Tewkesbury, who caused to be engraved upon it (in Latin) the inscription, "The Lord will be a refuge to our Lady Queen Margaret, and this stone for token," a prophecy ill-fulfilled by the event. The building of the college was interrupted by the Civil Wars; still the President, Andrew Duckett, was successful in obtaining for it the patronage of Elizabeth Wydeville, Queen of Edward IV. The number of Fellows was raised to nineteen, and as many as forty-five scholarships were founded. The endowments were much increased by Richard III. and other benefactors. Soon after the erection of the great quadrangle a large range of buildings was erected to the west, with, what is an exceptional feature for Cambridge, a cloister-walk on the ground floor. The arches are plain four-centred arches of brickwork, of three chamfered orders.

9. Catherine Hall was founded in 1473 by Robert Woodlock, Doctor of Divinity, Provost of King's College, and Chancellor of the University, who dedicated it to St. Catherine, and appointed a Master and two Fellows, and some Fellow-Commoners. The buildings formed a quadrangle. The hall, library, and Master's lodge were on the north side, and the chapel on the south, projecting eastward beyond the eastern range of chambers. This college was wholly rebuilt in the seventeenth and eighteenth centuries.

10. Jesus College was made into its present form from the pre-existing Nunnery of St. Rhadegund about 1495. The nunnery was endowed by Malcolm IV., King of Scotland, who was also Earl of Huntingdon. It was dissolved at the petition of John Alcock, Bishop of Ely and Lord Chancellor of England. Alcock's foundation was for a Master, six Fellows, and six scholars. I have already treated of the conventual church. The distinctive features of this college are the cloister surrounding the original quadrangle inherited from the nunnery, the entrance court, and the road leading to the entrance-gateway and running between the walls of the Master's and Fellows' garden. The cloistered quadrangle was universal in monasteries, but not to be found in colleges, except in their secondary courts. In ecclesiastical buildings the Vicars' Close at Wells presents a near analogy to the ordinary college quadrangle.

11. Christ's College was built on the site of a hostel called God's House, which had been originally settled near Clare College, and endowed in 1442 by William Bingham, Rector of St. John Zachary, London, but removed to this site to make room for the building of King's College. Margaret, Countess of Richmond and Derby, obtained a licence from her son, Henry VII., to complete the college, gave it a body of statutes, and lived to see the quadrangle completed.

The entrance gateway is to the west; on the opposite or eastern side are the master's lodge and the hall, having at its south end the butteries, and beyond them the kitchen, external to the quadrangle. The chapel occupies part of the north side, but extends beyond the eastern range of buildings. The remainder of the north side, the whole of the south side, and the greater part of the west are occupied by chambers. The library is on the first floor, on the west side, to the south of the gateway. The buildings have been much transformed externally, but the ancient structure remains.

Tradition says that Lady Margaret of Richmond was influenced by Bishop Fisher of Rochester in the interest she took in Christ's College. The exercise of that influence is much more certain in the foundation of St. John's. Dr. Fisher was Master of Michael House, in the immediate vicinity of the Hospital of St. John the Baptist. It had fallen into decay and disrepute about the time when Fisher became chaplain to Lady Margaret. She had endowed Christ's College with the Abbey of St. Mary of the Meadows at Creyke in Norfolk, and she now concurred with Fisher in his desire to devote the Hospital of St. John to educational purposes. Her death took place June 29, 1509, and the college was not begun until two years later. The building of the first court was carried on without interruption until its completion. The college was opened by Bishop Fisher, July 29, 1516. One of the buildings of the hospital was altered into a chapel for the college, and formed such part of the north side of the quadrangle as was not occupied by the master's lodge. The lodge had an oriel resembling the bayed windows we find in the churches and chapels of the period. It gave the master a view of every part of the quadrangle. The west side comprised the hall, buttery, and kitchen. On the south was a range of chambers. On the east side was the library, with chambers beneath it. The second court is entered through the screens of the hall. There is nothing unusual in a passage open at both ends in this position. It was probably seen from the first that the college would extend in this direction. The entrance gateway is of the type of which that at Queen's is the first example. It is of red brick, with angle turrets, having stone quoins. There is an ogee canopy over the gate. The central shield, with the arms of England and France quarterly, is supported by the Beaufort antelopes. In the tympanum beneath is a rose. To the right (heraldically) is a large rose, to the left (heraldically) a portcullis. Both are crowned. Daisies, the special emblem of the Lady Margaret, are sown throughout the whole space beneath the string-course. The arms were formerly emblazoned in gold and colours, whilst the horns of the antelopes were gilt. Resting upon the finial of the ogee is a niche with a figure of St. John, beneath the usual Tudor canopy.

12. Of this noble gateway that at Trinity College may be considered a more homely version. There the entrances are double, one for carriages, the other for foot passengers. These have always reminded me of the tale of Sir Isaac Newton that he cut two holes in his door, a big one for the cat and a small one for the kitten.

13. Trinity College sprang up from a variety of hostels, of none of which are there now any but the most fragmentary remains. The history of this noble college itself falls without our period.

14. Magdalene College stands apart in more senses than one. It occupies the site of an ancient Benedictine establishment, dating from 1428. Different religious houses built different portions; Ely built one chamber, Walden a second, Ramsey a third. The general name of this composite fabric was the "Monks' Hostel." After the Dissolution the building was carried

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on in succession by the Duke of Buckingham, Lord Audley of Walden, and the Duke of Norfolk. The buildings, with the exception of the Pepysian Library, were completed before the end of the sixteenth century. In the quadrangle of Magdalene is to be observed the corner staircase turret, a feature of Cambridge but not of Oxford colleges. The entrance gateway is unaccompanied by a tower. The hall, butteries, and kitchen occupy the east side, the hall being at the north end and the kitchen extending to the external south boundary of the buildings. On the north side is the chapel next the hall; the remainder was formerly occupied by the master's lodge. The south and west sides consist of chambers.

Magdalene College is at the foot of the Castle Hill of Cambridge, and I now end where I began, in Horace's phrase, "The close of a long journey and a long paper."

Mr. Butler Wilson, in proposing a vote of thanks to the lecturer for the trouble he had taken in preparing his paper, said that the subject of Cambridge was a very large one to deal with on one evening, and the ground which had been covered indicated that the lecturer had a very full knowledge of the subject, and he seemed to take it for granted that his audience knew something of Cambridge. The working out of the history of the collegiate buildings very quickly took them into antiquarianism, and perhaps, as a junior architectural association, consisting mainly of young students, they took more interest in that which was directly before them in daily practice. As a busy man, he found that however much he might be disposed to follow up the antiquarian subjects which presented themselves in the architectural world, he had to forego that pleasure, and the interest he took in buildings had to be focussed on that which might help him in his work. The colleges of Cambridge had all got histories; they had all been built to fulfil definite requirements, and in that there was a bond of sympathy between their builders and modern men.

Mr. Francis Hooper said he was glad to second the vote of thanks to Mr. Wood for his scholarly paper, and for showing his sketches of Cambridge buildings. It was true that the paper was more antiquarian than architectural, but there were few subjects that should be foreign to an architect, and, in a sense, the more antiquarian knowledge an architect possessed the better. It was interesting to learn how the University came to be established, also how much it was indebted to the Church for the educational work it undertook, and how the colleges, which began in a small way, had grown and had met the wants of the times. To what extent Cambridge University made the town, or the town the University, it would not be profitable to discuss. It was a happy fact—especially fortunate for architects seeking inspiration—that our two great Universities (Oxford and Cambridge) have been so little modernised. They were mediæval cities, and he believed that one could go to either place and throw one's self back into the life of the student of the sixteenth century, even the fifteenth century, when our national architecture was as virile as it ever had been. It was a matter, too, of great interest to recall the fact that the two universities, especially Cambridge, represented essentially a national architecture. He believed he was correct in saying that nothing could be found as a counterpart to the architecture of Cambridge in any part of the world; it was essentially characteristic of the scholastic and collegiate work of the fifteenth and sixteenth centuries. Many parts of the kingdom had been celebrated in times gone by for seats of learning. He had been much interested, during a short visit to Ireland, to find what great importance had been attached, especially in the middle ages, to the University at Lismore. Lismore is shown in our maps as a comparatively insignificant town, but in the middle ages it was a seat of learning resorted to not only by Englishmen, but by people from all parts of Europe. Unfortunately there was now nothing left of that University, and we should appreciate adequately the Universities we still possess nearer home. Did the lecturer know of any educational establishments in Europe in any way on a par with our Universities at Oxford and Cambridge?

Mr. H. Cayley said he once heard a lecture on Cambridge of about this period by Mr. Clark, of Cambridge, who showed a most interesting map of the town before many of the colleges were built, and from this it could be seen that at that time there were a number of churches and streets near the river. The river at that time was apparently the great highway of commerce, and no doubt the difficulties between town and gown were due to the manner in which the colleges encroached on the town. Mr. Clark showed how the colleges acquired some of their property. The beautiful open spaces which some of the colleges possessed were obtained by enclosing ground to which they had no right, and in the case of Trinity College the land was obtained by an exchange of land with the town, the college having no right to the property it was parting with.

The Chairman, in putting the vote of thanks to the meeting, said, as to the question of archæological papers, they had arranged a very varied syllabus for the present session. Perhaps, as had been said, the most popular papers were those which were a little more to the point as regards actual study or practice; but he did not think any one would underrate the value and importance of antiquarian papers such as they had listened to that evening. Without a knowledge of the history of buildings, we lost half the interest and delight of going over them. When we knew this history, the buildings could teach us lessons in our actual work, and also the reasons why certain forms were invented. As to the guilds referred to by Mr. Wood, he presumed they were practical guilds. Really, the origin of Oxford and Cambridge was very much like the origin of the Association, which consisted of members who banded themselves together as a guild in order to help on the training in their particular art or craft. It was to be regretted that Cambridge was in such low water financially, and that such a magnificent university should be rather languishing and unable to do as much as they ought to do for education. It was to be hoped that something would be done to aid the university. Great changes were taking place in regard to education in this country, and it would be interesting to compare the new colleges which Mr. Aston Webb was to build at Birmingham with what was to be seen in our old universities—not only as to structure, which would give expression to our new wants, but as what those wants are. At Birmingham, amongst other things, there was, he understood, to be a chair of brewing, and when they thought of that, the question whether Greek should be a compulsory subject or not at Cambridge seemed rather an archaic one. With the vote of thanks he should like to couple the name of Mr. A. N. Papworth, that gentleman having pointed out the illustrations shown by Mr. Wood.

The vote of thanks having been agreed to,

Mr. Wood, in reply, said in regard to his subject being archæological, so long as the Institute of Architects chose to examine in archæology, as they appeared to do more or less, it was certainly necessary that students should know a great deal about ancient buildings. He thought (though he did not wish them to take his guidance in practical matters affecting the examinations) that if they took a place like Oxford or Cambridge, or a cathedral town, and studied its edifices definitely and individually, making sketches and drawings of them, that would result in a better impression, a more definite idea, of architectural history than could be got by reading many books, or even by making many sketches of buildings widely separated. He had been very much struck with this idea in going over Cambridge, which he had known for long; and though he could not give the advice as an urgent recommendation, as he had not been in for the Institute examinations, he thought it might be practically useful. Another matter which had occurred to him was this: in Gilbert Scott's "History of Ecclesiastical Architecture in England," or in Rickman, everything was treated on an ecclesiastical basis, and he thought that our architecture had been treated too much in that way. Rickman's notes on castles were very disappointing, for all one seemed able to learn about them was that they were fortified places, whereas they were as valuable as churches. He (the speaker) thought that the plan of studying individual places would broaden our conception of Gothic architecture in the middle ages, and make that part of our studies more fertile. As to whether any other country could show such a large deposit of college buildings as England, he could not answer very positively, but he should say, decidedly not. Colleges were not so much places of residence in foreign places as in this country; the foreign universities and the colleges abroad were gathering-places where people came from different parts, and divided into countries. This was much the same in Scotland—at Aberdeen, for instance. As to the guilds, there were two classes: the craft-guilds, which some people thought were the origin of our trade unions (much the larger number were trade guilds) and the religious confraternities.

The meeting then terminated.

The next meeting will be held on the 15th inst., when Mr. Max Clarke will read a paper on "The Sanitation of a Country House."

COMPETITIONS.

Manchester Fire Station.—On the 31st ult. the Watch Committee of the Manchester City Council awarded the premiums for competitive plans for the erection of the proposed new fire station. A large number of plans were submitted by competitors in different parts of the country. The premiums have been won as follows:—First premium, 300*l.*, Messrs. Woodhouse & Willoughby and Mr. John Langham, of Manchester (joint plans); second premium, 200*l.*, Mr. Geo. Watson, Edinburgh; third premium, 100*l.*, Messrs. Magnall & Littlewood, Manchester. The new building is to be erected in London-road, on the triangular plot of land at the junction of Whitworth-street. It is estimated that the total cost, including land, will be over 100,000*l.*

Extension of Bristol Police-court.—New police-courts are to be built as part of the scheme of enlarging the petty sessional buildings in Bridewell-street, Bristol. The plans selected in competition for the extension were those sent in by Mr. Henry Williams.

Infant School, &c., Berwick.—The Berwick School Board have selected the design submitted by Mr. J. Landell Nicholson and Mr. Fred E. Dotchin, as joint architects, of Newcastle, for their new infants' school, caretaker's house, playsheds, &c. It was an open competition, and altogether thirty-one sets of plans were submitted.

Trowbridge Isolation Hospital.—In the recent competition for the Trowbridge and District Joint Isolation Hospital, to be built at Trowbridge, Wilts, the designs of Mr. J. Hugh Goodman, architect and surveyor, of Reading, were selected for the first premium, and adopted by the committee for the erection of the hospital, in accordance with the recommendation of the professional assessor. There were over fifty designs submitted in the competition.

Illustrations.

VICTORIA MEMORIAL: DESIGN FOR TREATMENT OF BUCKINGHAM PALACE FRONT.

THIS illustration is a greatly reduced copy—more reduced than we could have wished—of Sir Thomas Drew's drawing showing his proposal for remodelling the façade of Buckingham Palace, to which we have already referred in our last issue.

As our readers may remember, we have urged from the first that a part of the Victoria memorial scheme ought to consist of a new façade to Buckingham Palace, and that otherwise it would be a shabby and incongruous background to any memorial. Sir Thomas Drew has been of the same mind, and he here shows how he thinks it could be done, by bringing forward a wing at each end of the façade, so as to give shadow, and by introducing a columnar order between the windows, leaving the window openings as they are.

As treated here, the Palace front has a rich and dignified effect. Sir Thomas Drew estimates that the alteration might be carried out for about 100,000*l.* to 120,000*l.*

The drawing shows also the arrangement of the ground in front of the Palace, the placing of the Memorial, and the connexion of the central road with Constitution Hill and Buckingham Palace-road.

CHRIST CHURCH, LOWER SYDENHAM.

THE illustrations show the interior view looking east, and the exterior view from the

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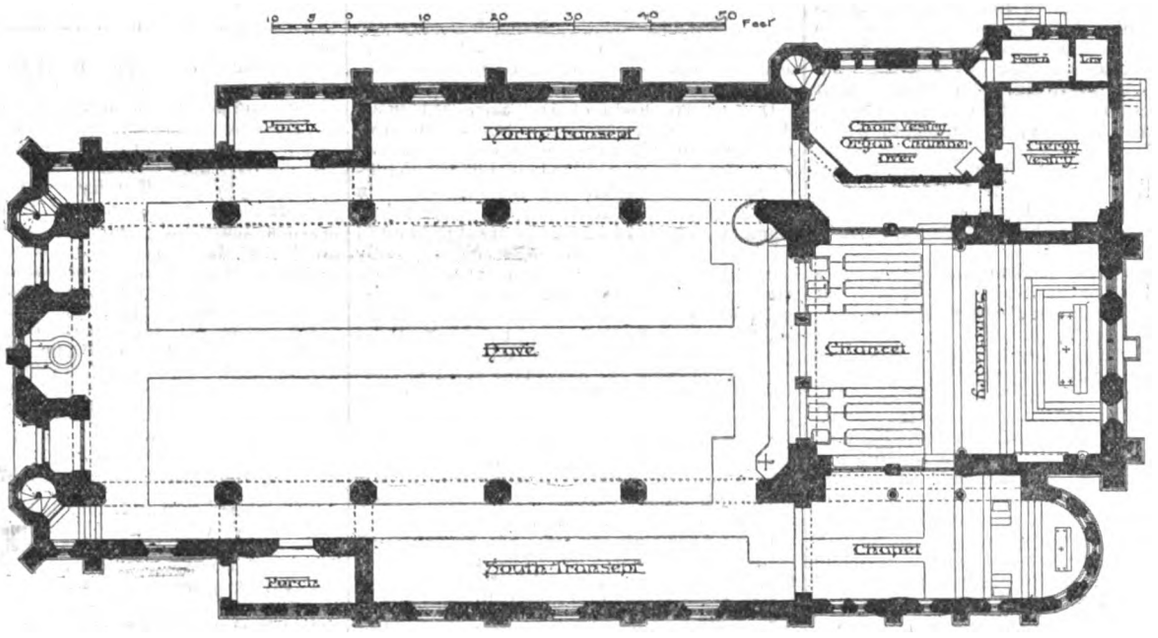

Christ Church, Lower Sydenham. Plan.

west end of the above-named new church, the foundation-stone of which was laid on Saturday, November 2, by the Rev. Canon Ainger, Master of the Temple. The exterior view was exhibited in the Royal Academy this year.

The main object of the design has been to get a lofty and effective building that would accommodate about 850 adults at a very reasonable cost, and to trust to the general massing and proportion, rather than to detail, for effect.

The main form of the plan is a nave 93 ft. long by 34 ft. wide, divided into five bays of 18 ft. centres. Broad processional passages are placed on either side, leading into north and south transepts, that on the south side terminating into an apsidal-ended chapel, and that on the north side into the organ chamber.

The baptistry is situated at the west end of the nave and has a vaulted roof, and is flanked on either side by a porch, over the whole of which is formed a small western gallery, which extends the entire width of the nave, and to which access is gained by two turret staircases, one on either side. These turrets are carried up externally the whole height of the building, and form one of the principal features of the west end elevation.

The chancel is 41 ft. 6 in. long by 28 ft. wide, with an altar, raised nine steps from the nave floor level. Spacious clergy and choir vestries are placed on the north side, with heating chamber under. The chancel is divided from the nave by a chancel arch, rising to the entire height of the nave, being filled with a rich traceried stone constructional screen, which forms one of the principal features of the design.

The roof, which is carried at one level through the nave and chancel, is of barrel form, with the addition of a coved cornice for future decoration.

The materials used are red brick relieved with stone dressings. Messrs. Goddard & Sons, of Dorking, whose tender for the work is 13,590*l.*, are the builders, and the architect is Mr. Geo. H. Fellowes Prynne, of Westminster.

HOUSE, BOWDEN GREEN, PANGBOURNE.

THE house is of red brick and red tiles—weathering dark upon the roofs. The work was carried out by Messrs. John Parnell & Son, of Rugby.

The joinery is all finished in white, except where of hard wood. The oak work in wall framings and ceilings is left in natural colour from the tool. In the floors it is waxed, but with a dull polish.

The lighting is by electricity, produced in the engine-house in the grounds. The voltage is a very low one and steam power has been found the most suitable.

Hot-water heating supplements the open fires, and a hot and cold water service is provided to the bedrooms.

Mr. Arnold Mitchell is the architect.

MAGAZINES AND REVIEWS.

THE *Art Journal* has a frontispiece of considerable interest—an etching by Mr. A. H. Haig of Buckingham Palace from the garden. Neither the garden nor the palace are ever open to the public, consequently this is a view known to few, taken from a standpoint obtained by special permission. The garden elevation of the palace, it may be observed, is a good deal better in an architectural sense than the entrance front. The number is largely occupied by articles on paintings and decorative art in the Glasgow Exhibition; the pictures illustrated are all well known, but the illustrations of decorative and industrial art include some things of novel interest. "How Wall-papers are Printed—by a practical paper-stainer," is a technical subject of interest in an artistic as well as in a mechanical sense, for a precise knowledge of the process of printing is not without its influence on the design. A short article on "The Piano as a Piece of Furniture" says much that has been said before as to the necessity, and the possibility now, of getting something better in the way of design than the stock model; but the two examples from Messrs. Broadwood's are not fortunately selected. One of these is the upright with folding doors, which we have before pointed out are in the way when hanging open on each side of the player—no musical amateur who "meant business" would take that form of piano; and in the grand piano by Mr. Chas. Allom the supports have not the appearance of strength which they should for a heavy instrument which has to be pushed about on the floor. In the reaction from the clumsy and lumpy appearance of the trade pianoforte-legs, designers seem inclined to go to the other extreme of want of solidity.

The *Art Journal* devotes its special annual number to the life and works of the painter whose real name is B. W. Leader Williams, but who wisely dropped the too common surname and became known in the world of landscape-art as Leader. He is not a painter with whom we can profess to have very much sympathy, but it must be admitted that his work, most carefully executed on its own lines, has pleased a greater number of people than, probably, that of any other contemporary landscape painter; and after all, as Mendelssohn once said in apology for inserting a rather light piece of music into a programme—"The people have rights."

The *Artist* gives some excellent examples of M. Charpentier's small bas-reliefs, to accompany an article on his work. The illustrations of metal-work by M. Scheidecker (a French artist in spite of his name) are of more value as warnings than examples in design.

The *Magazine of Art* has also an article on a medallist artist, Hans Frei, a Swiss artist and a native of Basle. He is not a Charpentier, but there is a great deal of interest in his more quiet and what may be called more *bourgeois* work; the head and bust called "Lauretta" has a great deal of character. It is observed that "his success lies in his strong originality and in his adaptation of mediæval style to modern technique," and the remark seems justified by the examples of his work given here. To architects an interesting article is the short one on the proposed new fish market at Venice, for which Signor Laurenti has made a design with an open loggia of pointed arches in the ground story, on columns without bases, the whole in fact borrowed from the suggestion of the Ducal Palace: old Venice revived. It is a question whether it will not appear too palpably a revival, a piece of modern-antique; but the effort seems to be prompted by a desire to do something in harmony with the ancient city.

The *Berliner Kunst*, of which the first number has reached us, appears to be a kind of supplement to the *Berliner Architektur-Welt*, intended to deal solely with furniture and industrial art; the present number being almost entirely occupied with illustrations of furniture, from which the English reader may form an estimate of the prevalent German taste in furniture. Some of the designs given are clever, but the mistake of them all is that they are too clever, too restless in style, and show a search after ingenuity and novelty rather than beauty. The grand piano figured on pp. 20 and 21 strikes us as hideous in design; the English new designs, if not always quite satisfactory in a structural sense, at all events show good taste and refinement. Among all the furniture illustrations the best thing is the chair by Keller & Reiner, of Berlin; its lines are simple and arise from a natural and unforced treatment of the construction. The *Berliner Architektur-Welt*, however, seems still to keep up its own industrial art section. In its latest number the most interesting architectural illustration is that of a curiously designed apartment house by Herr Paul Hobbe, in the Alt-Moabit; a house diversified with figures in low relief, fluting on the walls, &c., and with some varied and certainly very original treatment of some of the doorways, somewhat Egyptian in feeling; in that on p. 273, however, the cross-lintel looks a great deal too much like a block put in the rough to be carved subsequently. What is supposed to be the merit of the coloured scrawl by Herr Rieth which is given a page to itself, we cannot divine.

The *Architektonische Rundschau* is cosmopolitan apparently only as far as German work is concerned; that is, it illustrates work of the Germanic group of nations, but nothing English or French seems to be admitted. The illustrations are so well executed that it is vexatious to find them bestowed too often on designs which seem to have nothing to recommend them but eccentricity. The coloured print of the theatre at Meran, however, with its cream-white walls, red-tiled roofs, and details half Greek, half Roman, is a building of pleasing and suitable character; Herr Dülfer, of Munich, is the architect. A Vienna house

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by Professor Wagner of that city, a comparatively flat front over-run for a great portion with a flowing floral and spiral ornament presumably in *sgraffitto*, is a type of the strife after new treatment in street architecture. Herr Grässel's design for the entrance buildings to the new north cemetery at Munich, of which the central feature is a large square assembly-hall with an octagon cupola, the whole treated on very simple lines and with a good deal of sculpture decoration in low relief, is a pleasing conception, though perhaps a little too naïve in its architectural treatment.

The *Quarterly Review*, among various interesting articles on subjects not within our province, has a valuable and instructive one on "Antique Gems," ostensibly a review of Professor Furtwängler's important work, but in reality a general essay on this fascinating subject. Those who wish to feel a new and more vivid interest in Greek gems should read this article and study the British Museum examples in the light of it. "The South Pole" is an article on a subject which, though not connected either with art or construction, may be mentioned here as one which ought to interest all Englishmen without distinction of profession; and those who wish to get an impression of the chivalrous barbarities of old French duelling may find a most interesting and amusing disquisition on the subject in the review of the new edition of Brantôme.

The *Edinburgh Review* contains an article on the Glasgow School of Painting, which quite merits an article, but this one is written in what we call a very "provincial" spirit of criticism, the subject being treated entirely from the point of view of the Impressionist clique, as is obvious when we find that one question put in regard to the work of the Glasgow School is "how do they compare with their contemporaries of the South, like Mr. Rothenstein and Mr. Steer?" The best productions of the Glasgow School are quite beyond the productions of such artists as those named, and it is indeed almost an insult to Mr. Lavery to couple him with them. The writer is equally at sea as to what he calls the "lamentable degeneration of the modern Glasgow architects" as compared with "Greek Thompson"; a phrase which is really almost impertinent. Thompson was a man of genius, but a great deal of his work must be regarded as hopelessly *passé* now, and it is in any case not very well suited for the Scottish climate; and the fact is that Glasgow contains a larger proportion of architects who are really artistic and original designers than perhaps any other provincial city. The *Edinburgh Review* under its present management seems to have fallen sadly from the high standard of philosophic art-criticism which used to characterise it; it has descended to the level of the average art-critic.

Fetlden's Magazine contains long articles with illustrations on electrical and other machinery at the Glasgow Exhibition, but it was sent too late for us to go into the contents further than their general mention.

In the *Century* Mr. Timothy Cole starts a new series of wood engravings of "Old Spanish Masters." The one here given, that of the three-quarter length portrait of Saint Elizabeth of Zurbaran, is a perfectly beautiful bit of wood-engraving, and makes Zurbaran's work look more attractive than it generally does in the painted originals. In the same issue is an article on one of the most interesting practical topics of the moment—"The dirigible balloon of M. Santos-Dumont." The article, by Mr. Sterling Heilig, is written with the knowledge and consent of the inventor, and gives a good account of the situation up to the present moment. We call the subject a practical one, because M. Santos-Dumont has, for the first time, succeeded in giving some promise of being able to make it so.

Harper contains an illustrated article on "Old St. Saviours, Southwark," by Mr. Charles E. Russell, who calls it in his sub-title "The Elizabethan Actors' Church." The illustrations are architectural, but the writing is merely in regard to the historic associations with the church, which, however, are interesting enough, and should, as the writer observes, be more familiar to Englishmen than they are. Not infrequently we find that Americans know more about our antiquities than we do ourselves. The rebuilding of the nave is not alluded to. An article on "Athenian Conceptions of a Future Life," by Dr. Daniel Quinn, is an attempt to gather from Greek funereal monuments an idea as to the light in which the Greeks regarded death and the probability of re-union after death. Little, however, can really be gained in this direction from sculptured monuments which are—perhaps purposely—so vague and passionless in expression.

Under "The Field of Art" *Scribner* prints a short double essay, by two writers, on the ideal arrangement of pictures in an exhibition such as the Paris Salon, so as to hang pictures in harmony with each other and with the rooms in which they are placed, instead of jumbling together pictures of all classes of subject and of art indiscriminately. What is said is mostly quite true, as an ideal; but it is an ideal practically impossible to carry out, unless the number of pictures were reduced by two-thirds, and the time and cost incident to hanging them multiplied by three. The reduction of the numbers would be an advantage to the public; but even then, under the circumstances in which an annual exhibition on a large scale is organised, the other recommendations could not practically be carried out. After all, there is such a thing as being too fastidious. People ought to be able to enjoy a really fine picture apart from its surroundings.

In the *Pall Mall Magazine* Mr. Francis Watt continues his article on "The Rebuilding of London," devoting his article to Newgate, of which there are a good many illustrations, as well as a head-piece showing Mr. Mountford's building which is to take its place. The writer, however, does not seem to be the least aware that Old Newgate is architecturally a remarkable building, or that it was designed by an eminent architect, whose name is of course (in the usual way in England) entirely omitted from the account.

The *Gentleman's Magazine* contains a short but suggestive article by Dr. E. W. Adams on "The Old Science and the New." The point of it is to show how some of the old scientific writers often just touched the confines of a modern discovery but failed quite to grasp it, or put away the idea as a fancy. There are two interesting quotations from Bacon ("Novum Organum") in one of which he states his idea of heat as "a mode of motion" in language which might almost pass for that of a modern writer; in another he remarks that a strange doubt sometimes assailed him, as to whether we see the images of the sun and the stars as they are at the moment, or was the impression received really that of an image of some time ago; in other words, did light take time to travel? He was on the very verge of a new truth, but dismisses the idea again. In the same number Mr. Elland Gore gives some account of Houzeau, an eminent Belgian astronomer of the nineteenth century, whose name is little known beyond the world of astronomers; and Mr. S. H. Ditchfield, F.S.A., contributes what will be more immediately interesting to some of our readers—an article on "Brass-rubbing," in which a good deal of information is compressed into a small space.

International Notes, a small monthly magazine, which gives short notes of artistic doings in different parts of the world, publishes also a good illustrated essay or lecture on Greek art by an architect, Mr. C. J. Tait, of Exeter; whose name, however, is mis-spelt "Tate."

Knowledge contains a paper on "The Sinking of Large Stones through the Action of Worms," by Mr. Charles Davison, well known as a special student and investigator of earthquakes. The present paper is based on some experiments and observations by Darwin and by his son, Mr. Horace Darwin, of which the results are given, with a diagram showing the method whereby provision was made to minutely measure the movements of a stone about 18 in. diameter and 2¼ in. thick. The stone was found to be in a continual state of vertical oscillation; sometimes sinking further into the ground, at other times rising again, but we do not see that the movements were specially traced to the influence of worms; they appear to have been more the result of changes of weather. The subject, however, is of considerable interest in any case.

The *Leisure Hour* contains an article by the Rev. James Johnston on "Chained Books in English Churches and Cathedrals," chiefly notes on the present existing examples of this old custom, with illustrations of some of these chained libraries. In the same issue is the first instalment of a series of articles on our lighthouses, under the title "The Coastwise Lights of England" (the expression is from a poem by Mr. Kipling), by Miss Gertrude Bacon, popular of course rather than scientific, but which may be of use in giving the general public some information about this most interesting class of structures, and drawing their attention to the subject.

The *Essex Review* (quarterly) continues the subject of the Dykes of the Thames, their history and present condition, and the work of Vermuyden, the Dutch engineer, in the seventeenth century. The Dutch engineers were brought over here as being experts in the art of keeping the sea off a flat country, and were regarded with a good deal of jealousy in the districts they dealt with in England. The number contains illustrations of old Walton-on-the-Naze Church, and of the quiet unpretending country house called Bradwell Hall, destroyed by fire in 1839.

Macmillan includes a short but strong article by Mr. Lewis F. Day on "The New Art," an idea which he truly says is as far from possibility of realisation as the Gothic revival. Regarded as the outlet of youthful restlessness, he thinks, its extravagance may pass; as the serious expression of mature art it lacks coherence, sober sense, and sanity:—

"The theory is, that Nature is enough, that an artist has only to look at her and she will guide him in the right path—but there is absolutely no shadow of a reason why Nature should point out the way of art. In relying wholly upon Nature the artist is no better advised than in trusting altogether to art. The New Art, indeed, cannot be said to breathe the spirit of Nature; but professed allegiance to Nature does not lead always to natural results. It has resulted before now in ornament more suggestive of railway signals than of any natural growth; it has resulted also in the New Art; at least, its votaries take shelter under the name of Nature. And, until now, it has hardly been denied that the artist, study Nature as he may and as he must, is bound to study the methods of art also, aye, and the works of artists before him; or, admirably as he may do, he will fall short of his possible achievement. The sincere artist seeks always the best, not the newest expression of his personality."

The *Church Builder*, the quarterly record of the Incorporated Church Building Society, gives illustrations and description of Mr. Caröe's Church of St. John, High Wycombe, and of the small mission church at Arlesey, near Hitchin, of which Mr. Ryan-Tenison is the architect. From Mr. Micklethwaite's amusing and trenchant "Occasional Notes on Church Furniture and Arrangement," dealing in this issue (Chapter 9) with the subject of "Cheap Churches," we quote the following, which is sadly too true:—

"As a rule, the only thing about the plan which the committee concern themselves much with is the number of the 'sittings,' and everything which does not contribute to that is cut down to the utmost. Then it comes to building. But to carry out substantially anything like what appears on the show drawings would cost a good deal more than the sum which may be spent. Some semblance to the drawings must, however, be kept, so the walls are made of the thinnest and the roofs the slightest which will pass muster with the several authorities whose sanction has to be obtained. The materials are of the poorest. The foundations are shallow, and such furniture as there is of the meanest. But there is a profusion of trumpery Bath stone trimmings, and perhaps a lean steeple besides.

When it is new and redolent of varnish the committee are satisfied. It all seems very smart in their eyes, and they think their money well spent. A few years of use show them its inconvenience, and a few more unpleasantly force upon their attention that superficial smartness is not a good wearing quality. The building begins to fail for lack of the substance which has been squeezed out of it to pay for the show. Large sums have to be spent on its repairs, and in half a century it may be quite worn out."

SANITARY INSPECTORS' ASSOCIATION.

THE annual general meeting of this Association was held at the Carpenters' Hall, London Wall, on Saturday evening. Mr. W. Wilkinson, the new Chairman of the Council, presided, and in his inaugural address congratulated the members on the financial stability of the Association, the capital account showing assets of 3,359*l*. He thought the Association had entered upon its session's work with more promise than had ever before been the case, because from the highest to the lowest throughout the land there was more appreciation of sanitary work than had ever before been the case. The King had, almost in his first utterance after ascending the throne, sounded a note for the better housing of the poor. The Association represented those who had in their dull routine of work to carry out the drudgery of the sanitary administration, and they, in an

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equal degree with others in a more exalted position, shared the desire that there should be a better and happier condition of life for everybody. The sanitary inspectors, along with many other sanitary administrators, voiced the desire that, inasmuch as public health was a national asset, the operations of all sanitary authorities should be controlled by a central body which would be supported from Imperial sources and have as its chief functions the protection of the nation's health. They further contended that, inasmuch as public health was a nation's wealth, that local administrative bodies should be allowed a sufficient period for the repayment of the cost of the work which was necessary to secure that good.

Sir J. Crichton Browne was elected President for the ensuing year, and the Chairman congratulated the members on securing one so eminent and learned for that position.

STANDARD SECTIONS IN IRON AND STEEL STRUCTURE.

THE following remarks on this important subject form a portion of the address given to the Institution of Civil Engineers on Tuesday last by their President, Mr. Charles Hawkesley. They are worth the consideration of architects as well as engineers.

"Most British civil engineers have probably suffered inconvenience, and their clients not unlikely have sustained loss, owing to the absence in Great Britain of standard sections of iron and steel. For example, when designing a roof or a bridge, the engineer selects from the book of some well-known firm the sections of angle and tee iron best suited to his requirements, the contract for the work is let, and presently the contractor asks if he may be allowed to substitute another section for one of those selected, as that particular section is out of stock, and is either no longer rolled, or the quantity required is too small to induce the maker to put in the rolls to produce it. These difficulties have led to the adoption in Germany and America of standard sections of iron and steel with great advantage to the producer, the middleman (if any) and the buyer. The producer can cheapen the cost of production, because he can roll considerable quantities of any given section at one time, and place in stock any surplus. The middleman (if any) can buy in the cheapest market, and be sure to find an outlet for his purchases; the buyer can feel sure of obtaining the section that he requires from one firm or another with the least amount of delay, and at the least cost.

For some time past the Council of the Institution of Civil Engineers has realised the serious difficulties and disadvantages under which British manufacturers are placed by the lack in this country of some acknowledged standards. Our trade and interests are more far-reaching and world-wide than those of any other country, and this makes the question of standardisation more important, but at the same time more difficult. The Council of the Institution of Civil Engineers therefore approached the Institution of Mechanical Engineers, the Institution of Naval Architects, and the Iron and Steel Institute with a view to taking up this subject, and a strong and influential committee representing these four institutions was formed. The Committee decided in the first instance to call for evidence from all the various industries interested and affected as to whether they were favourable or not to the adoption of standards in the principal various rolled iron and steel sections used in building construction, railways, bridges, &c. The Committee sat for three days in June last, hearing evidence from all parts of the country and from those representing our colonies and dependencies, and the evidence as to the desirability of issuing standard sections and standard specifications was so unanimous, that the Council of this Institution decided to accept the Committee's recommendation and to proceed with the work forthwith. The work of the Committee has been divided into the four sections following:—

Section.	*Chairman.*
(1) Bridges and general construction	Sir Benjamin Baker.
(2) Railway rolling stock under frames	Sir Douglas Fox.
(3) Rails.....	Sir John Wolfe Barry.
(4) Ships	Mr. Arch. Denny, of Dumbarton.

These four Committees, on which the leading men of their several branches of industry are associated, are now at work standardising the various sections used in their particular branches of industry.

The evidence before the Committee was interesting as showing the various methods in which the different countries carried out their work. For instance, in America, where the American Society of Civil Engineers has issued standard sections for rails and standard specifications, the rolling-mill makers will, in most cases, only roll to these sections. It transpired that from time to time various enquiries had been sent to America from this country for tenders for large quantities of rails and of other materials that were needed by companies in this country; but in nearly every case the reply was that 'unless you take our standards we regret we do not see our way to quote.' On the other hand, some instructive instances of the waste of time and money that occurs in this country for the want of standard sections were laid before the Committee. Many might be cited, but one instance must suffice. The case in point was a section incorporated in a bridge for one of our colonies. The average cost of the material was 8*l.* 10*s.* per ton, but one of the sections specified was of such an odd size and the quantity of this size was so small that the section had to be made by a blacksmith at a cost of from 28*l.* to 30*l.* per ton. The multiplication of the number of sections is often quite unnecessary, and a striking case of the money that is lost or wasted in this way occurred a short while ago, where certain sections were specified in a bridge. When the contractor endeavoured to obtain these sections, and although they were contained in the price list issued by the makers, the makers themselves had none of the sections in stock, and could not give delivery. The contractor therefore worked out a girder of similar strength, incorporating therein sections which could be readily obtained, and the saving on this item alone was over 600*l.* Innumerable instances of this kind could be multiplied did the time at my disposal permit of it. It is therefore with a view to lessen the cost of and expedite the carrying out of the works designed by engineers, as well as to enable the British manufacturer to meet the keen competition which is now threatening even our home markets, that the Institution of Civil Engineers has taken in hand this important matter.

It may be interesting to quote what Germany and America have done in the direction of standardising rolled sections.

Germany has sixty-seven various standard sections and America has only forty-nine, whereas Great Britain has no standard sections, and uses over 170 different sections. The need of standards for rails in connexion with electrical traction is being particularly felt. It was recently shown that there were no less than seventy-one different sections of tram rails, many of the municipal engineers designing their own sections, only slightly differing from those of their neighbours, but having just sufficient difference to cause considerable expense and trouble should their tramway system ever become connected to the neighbouring system. The tramway industry of this country is developing every day, and it is highly desirable that standards should be adopted before the industry begins to suffer more acutely from the want of them.

The American practice is to reduce the numbers of sections as much as possible; but this is, to my mind, travelling too far in the opposite direction. Care must be taken to provide a considerable variety of sections in the first instance, and to provide for adding to them from time to time as occasion may require.

The chief disadvantage of standardisation, it has been urged, is that a fixed set of sections tends to cramp originality of design, and this is not merely a groundless fear, for the American manufacturers have in many instances absolutely refused to roll anything outside their stock patterns. Such a course would, however, doubtless soon provide its own remedy, for if anything was to be gained by the adoption of a new design, a sufficiently high price would probably be offered by the buyer to induce some foreign manufacturer to execute the order if our own countrymen persisted in their refusal to do so.

I feel assured that the action of the Council in this matter will be hailed with satisfaction by the members of this Institution, and more especially by those of our professional brethren who are resident in India or our colonies, and I hope the time is not far distant when the system of standardisation may be extended to other engineering requirements, as, for instance, to cast-iron pipes, always, however, bearing in mind that engineering designs must not be reduced to the level of the manufacturers' standards, but rather that the standards must be kept abreast of the requirements of the engineer."

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday evening last, Mr. Charles Mason, President, in the chair, a paper was read on "The Main Drainage of Ilford," by Mr. Roger Gaskell Hetherington. The author observed that the first drainage scheme was prepared by the late Mr. Brundel in 1882, when the population was only 7,500. The present scheme has been designed for a population of over 100,000 by Messrs. John Taylor, Sons, & Santo Crimp, and the old system has been incorporated with it. The drainage area is such that one portion of it only can be drained by gravitation. The various lines of sewers and their functions were described, and details of the construction of the main sewers were given. The general screening and pumping arrangements on the low-level sewers were also described. The outfall works, as first constructed, became in time inadequate, and they were greatly enlarged in 1898, and the present system of dealing with the sewage was then started. This method consists of treating the crude sewage with milk of lime and ferrous sulphate and then passing it through settling tanks. From the settling tanks the effluent is taken into coke breeze bacteria beds, and from thence to the river Roding, the sludge left in the tanks being pressed by sludge-pressing machinery. Owing to the works being required to deal with a considerably larger flow than that for which they were designed, the effluent has become unsatisfactory, and other modifications in the works are now being undertaken. The chief of these is the construction of an entirely new outfall to the river Thames. This effluent pipe will discharge into the Thames below the London Northern Outfall at Barking. As this outfall pipe, which is 2 ft. 6 in. in diameter, passes through a large tract of land lying below high-tide level, elaborate precautions have had to be taken to prevent tidal water being admitted to this low-lying land by any failure of the pipe. The scheme as a whole presents some interesting points as regards meeting the ever-recurring problem of treating the sewage of a district with a rapidly increasing population, without discarding the existing system, which was never designed for great enlargement.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The annual business meeting of this Association was held in the New Rooms, No. 117, George-street, on Wednesday evening, October 16th, Mr. Henry F. Kerr, President, in the chair. The reports of the Hon. Secretary, Hon. Treasurer, and the Conveners of the various Committees were submitted and approved. The resignation of Mr. Thomas Fairbairn, Hon. Secretary, was intimated on account of his health. Mr. Fairbairn has acted as Hon. Secretary of the Association for the long period of twenty years, and a very warm tribute was paid to him for the splendid service he had rendered the Association during his lengthy term of office, to which Mr. Fairbairn feelingly replied. The most interesting and important business was the formal amalgamation of the Edinburgh Architectural Society with the Edinburgh Architectural Association. The arrangements for the amalgamation were concluded some time ago, but this was the first joint meeting held. Mr. Henry F. Kerr was re-elected President for the coming session with the following other office-bearers:— Vice-Presidents, Mr. A. Hunter Crawford and Mr. A. Lorne Campbell; Hon. Secretaries, Mr. William M. Page and Mr. Colin B. Cownie; Hon. Treasurer, Mr. John Johnstone; Hon. Librarian, Mr. John Watson; Committee of Management, Messrs. James Bruce, W.S.; Thomas Ross, F.S.A. (Scot.); George Henderson, Hay Lamont, Alfred Greig, and A. F. Balfour Paul. The Amalgamated Association now comprises

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Fellows, Members, and Associates. The Associates' section is to have a series of meetings and papers of its own, and has appointed the following office-bearers :—Chairman, Mr. J. Stuart Syme; Vice-Chairman, Mr. J. F. Matthew; Hon. Secretary, Mr. J. McIntyre; Committee, Messrs. J. Sidey, D. Davidson, Hay Lamont, J. Jerdan, B. S. Murphy, and J. A. Arnot. On Monday evening last the formal opening of the rooms took place, when the President and office-bearers held a reception, at which about 250 ladies and gentlemen attended. Sir George Reid, President of the Royal Scottish Academy, declared the rooms open, and Bailie W. S. Brown, as representing the city, and Professor Baldwin Brown, as representing the University, addressed the gathering.

ARCHITECTURAL ASSOCIATION OF IRELAND.—An Exhibition of Drawings, prepared by members of the Association, has recently been held in the rooms of the Royal Institute of the Architects of Ireland, by the kind permission of the President and Council of that body. The drawings consisted of the competitive works of members for the various prizes offered during the past session. Among these were nine large sheets of accurately-measured drawings of St. Patrick's Cathedral, Dublin, executed by Mr. T. A. Rockett, who has earned the prize—the Association Travelling Studentship—in competition for which they were prepared. Another set of measured drawings were shown of Mellifont Abbey, by Mr. A. C. Scott, of Drogheda. Seven sets of drawings were shown which had been prepared in competition for the prize offered by the Royal Institute of the Architects of Ireland for the best design for a Technical School. The prize was awarded to the drawings by Mr. Charles Powell. Three sketches of the Campanile in the Quadrangle at Trinity College were on view, one by Mr. L. O'Callaghan taking the Beckett Prize. The class drawings which were exhibited demonstrated the fact that real hard work is done by the members, and that the object for which the Architectural Association of Ireland was founded is being very well kept in view—that is, of providing a school wherein the younger members of the profession in Ireland may acquire knowledge of design and draughtsmanship.

THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Poplar Borough Council 7,000*l.* for electric lighting; Woolwich Borough Council, 1,910*l.* for street improvement; Stepney Borough Council, 2,050*l.* for similar purposes; and Stepney Borough Council, 10,000*l.* for electric lighting.

London Water Supply.—The Water Committee recommended as follows :—

"(*a*) That a Bill be promoted by the Council in the Session of 1902 for the purchase by the Council of the undertakings of the eight Metropolitan water companies, the Bill to be on similar lines to that of last Session.

(*b*) That it be referred to the Parliamentary Committee to prepare and submit to the Council the necessary Bill for carrying out the above recommendation; and also to prepare and submit the necessary Water (Finance) Bill."

After a long discussion the recommendations were agreed to.

Improvement.—It was agreed to contribute 1,487*l.* towards the cost of widening Hare-street, Woolwich, at Nos. 1 to 37.

Tenders.—The following recommendations of the Parks and Open Spaces Committee were agreed to :—

"That the gravel and hardcore required for the formation of the new cycle track at Parliament Hill be obtained from Mr. H. Barnaby, at a cost of 7*s.* 0*d.* a yard for gravel and 3*s.* a load for hardcore.

That the offer of Mr. H. Clarkson, to supply and cart to the Victoria Embankment the soil required for the tree-pits at 5*s.* a load, and for carting away the old soil at 5*s.* a load, be accepted."

The Bridges Committee recommended, and it was agreed :—

"That the supplemental estimate of 1,535*l.* submitted by the Finance Committee in respect of electrical lifts, fans, pumps, wiring, lamps, and fittings at Greenwich Tunnel be approved; that the amended tender of Messrs. Easton & Co., amounting to 7,554*l.* 2*s.*, be accepted."

The Highways Committee recommended, and it was agreed :—

"That, subject to the result of the usual inquiries proving satisfactory, the tenders of Messrs. Walter Scott, Ltd., be accepted, for the supply, (A) for the sum of 25,442*l.*, of the track-rails and fastenings; and, (B) for the sum of 25,334*l.*, of the slot-rails, conductor-tees, and fastenings required in connexion with the reconstruction, for electrical traction, of the London County Council Tramways, between (*a*) Westminster Bridge and Tooting, (*b*) Blackfriars-road and Kennington, and (*c*) Waterloo-road and St. George's-circus.

That Messrs. Walter Scott, Ltd., be allowed to sub-let to the Helicoid Lock-nut Co., of Acton, the supply of the bolts and nuts under contracts (A) and (B), and to another sub-contractor, to be approved by the Engineer (Dr. Kennedy), the supply of the tie-bars under contract (B), and also, under contract (A), to employ the Coghlan Steel Co., of Hunslet, to roll the fish-plates and other small work, for which Messrs. Scott will themselves manufacture the metal.

That, subject to the result of the usual inquiries proving satisfactory, the tender of Messrs. J. G. White & Co. be accepted for the execution, for the sum of 171,145*l.*, of the roadwork and platelaying required in connexion with the reconstruction, for electrical traction, of the London County Council Tramways between (*a*) Westminster Bridge and Tooting, (*b*) Blackfriars-road and Kennington, and (*c*) Waterloo-road and St George's-circus.

That Messrs. J. G. White & Co. be allowed to sub-let to Messrs. W. Griffiths & Co. the roadwork, and to the Lorain Steel Co., of Ohio, U.S.A., the special work (namely, points and crossings)."

Railways and Rehousing.—On the motion of Sir J. Dickson-Poynder, it was resolved :—"That, in the opinion of the Council, it is desirable that in all cases when railway companies seek powers from Parliament necessitating schemes for rehousing persons displaced, the companies should, in lieu of being bound to undertake the work themselves, pay to the Council the equivalent in money of the cost of carrying out such schemes, the execution of the work being left to the Council, to be dealt with in such manner as they may think best, and that the Railway Commissioners should be constituted by Parliament capable of determining the amount to be paid in each case; and that it be referred to the Parliamentary Committee to consider and report in what manner the matter can be brought to the notice of his Majesty's Government."

Other matters were disposed of, and the Council adjourned.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Bermondsey.—A building, to be used as a girls' school, on the north side of New Kent-road, Southwark, next Buckenham-square (Mr. W. C. Jones for the Governors of St. Saviour's and St. Olave's Foundation).—Consent.

Clapham.—A one-story shop commenced to be erected on the forecourt of No. 650, Wandsworth-road, Clapham, abutting upon Queen's-road (Mr. R. E. Smith for Mr. M. Jones).—Consent.

Hampstead.—A one-story bay window in front of a house in course of erection on the north side of Elsworthy-road, Hampstead, to be known as "Shepherds Well" (Mr. A. F. Faulkner for Mr. W. Willett).—Consent.

Hampstead.—The erection of a brick, wood, and tile porch to a house in course of erection on the north side of Elsworthy-road, Hampstead, to be known as "The Warren" (Mr. A. F. Faulkner for Mr. W. Willett)—Consent.

Hampstead.—A one-story bay-window in front of a building in course of erection on the north side of Elsworthy-road, Hampstead, to be known as "The Warren" (Mr. A. F. Faulkner for Mr. W. Willett).—Consent.

Kensington, South.—A stone hood over the entrance to No. 21, Kensington Gore, Kensington (Mr. A. O. Collard for Sir John Hutton).—Consent.

Lewisham.—Balconies over the entrances to fifteen houses to be erected on the west side of Lawrie Park-road, Sydenham (Mr. E. Tompkins).—Consent.

Lewisham.—A one-story shop on part of the forecourt of No. 262, Brockley-road, Lewisham (Mr. J. H. Waterworth for Mrs. M. A. C. Beacock).—Consent.

St. George, Hanover-square.—An iron and glass shelter at the entrance to No. 15, Wilton-road, Pimlico (Mr. C. Gerli).—Refused.

Strand.—An iron and glass shelter over the entrance to the Villa-Villa Restaurant, Nos. 37 and 38, Gerrard-street, Soho (Mr. R. H. Kerr for Mr. Tarvin).—Refused.

Wandsworth.†—A wooden porch at the entrance to No. 1, Rodway-road, Roehampton (Mr. J. Harvey for Miss P. Higgins).—Refused.

Westminster.—A one-story shop in front of No. 133, Victoria-street, Westminster (Messrs. Bull & Esdaile for Messrs. Symons & Co., Ltd.).—Refused.

Width of Way.

Wandsworth.—Stable buildings at the Tooting Bec Asylum, on the west side of Church-lane, Tooting (Messrs. A. & C. Harston for the Metropolitan Asylums Board).—Consent.

St. Pancras, East.—Two cottages at the rear of Nos. 18 and 20, Jeffreys-street, Kentish Town-road (Mr. T. B. Westacott).—Refused.

Islington, West.—A stable building at the rear of Nos. 42, 44, and 46, George's-road, Holloway, with the external walls at less than the prescribed distance from the centre of George-street-mews (Mr. S. Allen).—Refused.

Lines of Frontage and Width of Way.

Clapham.—That the application of Mrs. R. S. Gray for an extension of the period within which the erection of eleven houses with bay-windows on the east side of Loats-road, and seven houses with bay-windows on the west side of Lyham-road, Clapham, was required to be commenced, be granted.—Agreed.

Width of Way and Space at Rear.

Hackney, South.—Three-story dwelling-houses and a boat-house on the south-west side of Middlesex-wharf, Lea Bridge-road, Hackney (Messrs. J. G. & H. G. Needham for Mr. T. Marvell).—Consent.

Lines of Frontage and Construction.

Hammersmith.—A coal transporter on the West Middlesex Waterworks Company's land on the north and south sides of Upper Mall, Hammersmith, and extending over such street (Mr. M. W. Hervey for the West Middlesex Waterworks Company).—Consent.

Hampstead.—The retention of a brick fodder store and a wood and brick tool-shed at Cranbrook-stables, Nutley-terrace, Hampstead (Messrs. White & Page for Mr. J. Duveen).—Refused.

Formation of Streets.

Clapham.—That an order be issued to Mr. C. G. St. John, sanctioning the formation or laying-out of a new street for carriage traffic, to lead from Navy-street to Voltaire-street, Clapham. That the name Army-street be approved for the new street.—Agreed.

Poplar.—That an order be issued to Mr. H. Hooper, refusing to sanction the formation or laying out of new streets for carriage traffic out of East Ferry-road, Millwall (for Lady Margaret Charteris).—Agreed.

Means of Escape from Top of High Buildings.

Holborn.—Means of escape in case of fire, proposed to be provided on the top story of the front portion of a building on the site of Nos. 120, 122 and 124, Southampton-row, Bloomsbury, for the persons dwelling or employed therein (Mr. P. E. Pilditch for Mr. A. E. Parker).—Refused.

Height of Buildings.

City.—A block of offices on the western side of Lloyds-avenue, Fenchurch-street, City (Messrs. Davis & Emmanuel for Lloyds-avenue Estate Co.)—Consent.

Deviations from Certified Plans.

City.—Deviations from the plans certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed rebuilding of the Hoop and Grapes public-house, No. 14, Widegate-street, City, and the erection of a warehouse building on the site of Nos. 2 and 3, Sandys-row (Mr. W. M. Brutton for Mr. Evans).—Consent.

The recommendation marked † is contrary to the views of the Local Authority.

METROPOLITAN ASYLUMS BOARD.—The fortnightly meeting of this Board was held on Saturday, Mr. Benson presiding. The Works Committee was authorised to obtain tenders upon a specification to be prepared by the Engineer to the Board for removing the wires from the conduits and rewiring the head office building where necessary on the surface. The tender of Messrs. Chas. P. Kinnell & Co., Ltd., of Southwark-street, was accepted in 70*l.*, for carrying out certain additional heating works at Rochester House, in accordance with the plans and specifications prepared by the Engineer to the Board.

PENNINGTON CHURCH, MANCHESTER.—A three-light window and tracery in this church has been filled with painted glass. The subject chosen is "Faith, Hope, and Charity." The bases and canopies are treated in the Early Perpendicular style, and the tracery is filled with angels in adoration. The work has been carried out by Mr. H. A. Hymers, of Chelsea.

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Correspondence.

To the Editor of THE BUILDER.

COMPENSATION FOR DISTURBANCE BY BUILDING OPERATIONS.

SIR,—A Municipal Corporation proceed, by contractors, to pull down buildings acquired under parliamentary powers for street improvement in an important thoroughfare. In so doing a tenant under lease in adjoining premises has suffered considerable inconvenience and loss by interruption of his business consequent upon accumulations of old materials, dust, noise, and other disturbances, which to some extent could have been avoided had the authorities taken the requisite precautions.

The exposure of and damage to the party wall has destroyed the comfort of some of the rooms, and fear as to its safety at one time caused the occupants to vacate the premises.

If any reader would state his experience or give reference to any records or reports showing what compensation a tenant or landlord may be entitled to for such disturbance, he would oblige an old reader and, no doubt, many others who may be liable to the same kind of injury. CITIZEN.

BOOKS RECEIVED.

SCOTTISH ARCHITECTURAL DETAILS. By John W. Small, F.S.A. (Stirling; Eneas Mackay: London: Gibbings & Co.)

BACTERIAL PURIFICATION OF SEWAGE. By Sidney Barwise. (Crosby Lockwood & Son.)

MODELLING: A GUIDE FOR TEACHERS AND STUDENTS. By E. Lanteri. (Chapman & Hall.)

ELEMENTARY PRACTICAL HYGIENE. By W. S Furneaux. Section I. (Longmans, Green, & Co.)

THE CHEMISTRY OF PAINTS AND PAINTING. By A. H. Church, F.R.S (Seeley & Co.)

THE PRACTICAL ENGINEER POCKET-BOOK FOR 1902. (Manchester: Technical Publishing Co.)

THE PRACTICAL ENGINEER ELECTRICAL POCKET-BOOK FOR 1902. (Manchester: Technical Publishing Co.)

PERSPECTIVE FOR ART STUDENTS. By Richard G. Hatton. (Chapman & Hall.)

BOOKBINDING AND THE CARE OF BOOKS. By Douglas Cockerell. (John Hogg.)

The Student's Column.

GAS AND GAS FITTINGS.

19.—OFFICIAL GAS EXAMINERS AND THEIR WORK. HOW GAS IS TESTED FOR ILLUMINATING POWER AND PURITY.

OFFICIAL GAS EXAMINERS.—Competition in the supply of illuminating gas is no longer permitted in any part of the United Kingdom because the nuisance created by the incessant tearing up of the public roads by rival companies was found to be intolerable. The operations of one gas company in each district in addition to those of the water company, the electricity supply company, the telegraph authorities, the tramway and railway engineers, and the road repairers, already cause too frequent disorganisation of the traffic in many of the main thoroughfares. The country is therefore divided into districts, each of which is served with illuminating gas by only one company or local authority. Quite recently power has been given to the Mond Gas Co. to distribute cheap low grade gas for heating and power purposes in certain Staffordshire districts already supplied with illuminating gas, but this is a departure from the policy adopted by Parliament during the last half century.

The operations of each gas company are conducted under powers and conditions specified in certain Acts of Parliament, each company having its own special Act or Acts relating to the laying of pipes, the opening of streets, and the standard price, illuminating power, and purity of the gas to be supplied. Many of the smaller companies are controlled by the Gas Works Clause Act of 1871, which stipulates that a place for testing the gas, and the necessary apparatus, shall be provided and maintained by the gas company, and that the official gas examiner appointed by the Local Authority shall have access to such testing place within certain specified hours. Where no such gas examiner is appointed by the Local Authority, two Justices may, upon the application of not less than five consumers, appoint a competent and impartial examiner to test the illuminating power and purity of the gas. The standard illuminating power of the gas supplied from small works in England is usually 14 or 15 candles, and the gas is required to be purified from sulphuretted hydrogen only.

In large towns a much more elaborate system of testing is commonly adopted, and a more rigorous purification of the gas is required. In London their are twenty testing stations well distributed over the area under the jurisdiction of the London County Council, in which the gas is tested every day for purity and illuminating power by examiners appointed by the Council. Within the City boundaries three additional testing stations are provided, in which the gas is similarly tested by examiners appointed by the Corporation of London. The County Council and the Corporation, moreover, each retain the services of an eminent chemist to act as superintending gas examiner and to advise on all matters relating to the public gas supply. The situation and number of the testing stations to be maintained by the gas companies, and the methods of testing to be adopted by the examiners, are prescribed by three gas referees appointed by the Board of Trade. A chief gas examiner who acts as arbitrator when a gas company appeals against the report of any of the gas examiners, and whose decision is final, is also appointed by the Board of Trade. The present chief gas examiner is Lord Rayleigh, F.R.S., and all of the gas referees are also Fellows of the Royal Society. The Act stipulates that one at least of the referees shall have "practical knowledge and experience in the manufacture and supply of gas," but owing no doubt to the able manner in which the scientific men have carried out the duties of the office no practical gas engineer has been appointed as a referee for many years.

At present the Acts of Parliament which control the operations of the metropolitan gas companies regulate only the pressure, the illuminating power, and the purity of the gas from sulphuretted hydrogen, other sulphur compounds, and ammonia; but in view of the increasing use of materials other than coal for the manufacture of gas, it appears probable that Parliament will presently be requested by the Local authorities, on behalf of the consumers, to fix a minimum standard for heating power, and a maximum standard for the proportion of carbon monoxide, and that the gas examiners will be called upon to include determinations of these in their daily tests. Already a Home Office Committee has recommended that wherever water-gas is mixed with coal-gas for public supply, a limit for carbon monoxide be fixed, and the London County Council has granted a sum of money for the purpose of making a series of estimations of the proportion of this poisonous constituent in the gas supplied in different parts of the metropolis.

In the Mond Gas Company's Act of 1901, which relates only to gas for heating and power purposes, standards have been fixed for heating value and for carbon monoxide, and provision has been made for the gas supplied to be tested by gas examiners appointed by the Local Authorities.

Illuminating Power.—It is beyond the scope of the present series of articles to discuss in detail the various methods of measuring the intensity of the light emitted from gas flames and other light sources. For detailed information reference should be made to Dibdin's "Practical Photometry," or Butterfield's "Chemistry of Gas Manufacture"; but a brief general outline may be given of the official methods of testing.

The illuminating power of gas in this country is expressed in "candles," a standard candle being the light emitted by a sperm candle (six to the pound) when consuming sperm at a rate of 120 grains per hour. The intensity of the light thrown upon an object by a light-emitting surface varies inversely as the square of the distance of the object from that light-emitting surface. Thus a flame which will throw a light of 16 candle-power upon an object 1 ft. distant, will throw a light of only 4 candle-power upon an object 2 ft. distant.

The Bar Photometer.—In the old method of gas testing (fig. 49) which is still employed in many districts, the measurement of light is made by burning two standard candles (A) at one end of a graduated horizontal bar (C) while the Argand burner (B), in which the gas is tested when burning at a rate of 5 cubic feet per hour, is fitted at the opposite end of the bar. The distance between the centre of the gas flame and the candle flames is exactly 60 in., and plumb lines are fitted at each end of the bar to enable the photometrist to see that the flames are vertical and the correct distance apart. A greased paper disc, having a circular spot in the centre which is left ungreased, is fitted in the disc-holder (D), which is mounted on wheels and can be moved along the bar either towards the gas flame or towards the candles. The greased and ungreased portions of the disc have a different degree of translucency, and if the light thrown upon one side of the disc is more powerful than that thrown upon the opposite side, one side of the disc is at once seen to be illuminated to a greater or less degree than the other side. When the gas is being tested the disc is moved towards the candles or towards the gas flame until the disc is seen to be equally illuminated upon both sides, and it is then known that the disc is receiving an equal amount of light from the two candles as from the gas flame.

Attached to the disc-holder is a pointer which moves in front of the graduated scale on the bar as the disc is moved, and as the bar is graduated to indicate candles (thus obviating the necessity of measuring the relative distances of the gas flame and the candles from the disc) the candle-power of the gas flame may be obtained by observing the figure on the scale indicated by the pointer, and multiplying this figure by two, because two candles are used as the source of comparison. Thus, if the pointer be opposite the figure 8 when the disc is equally illuminated on both sides the illuminating power of the gas flame is 16 candles; or if opposite the figure 7, the illuminating power is 14 candles. As a standard candle is defined as a sperm candle burning sperm at a rate of 120 grains per hour, it is always necessary to ascertain the rate of sperm consumption during each test. This determination is made by employing a balance as the candle-holder (fig. 49), and by means of the standard stop-clock (F) observing the time taken by the two candles to lose exactly 40 gr. in weight. The time should be exactly ten minutes, and when the rate of sperm consumption is above or below the specified amount a correction must be made by calculation. The balance-governor (G) is provided to prevent any fluctuations in the rate of gas consumption during the test, and the King's gauge (H) is a sensitive pressure-gauge, which can be used to ascertain the pressure of the gas as it issues from the burner, or at the inlet or outlet of the meter. As the volume of gas varies with the temperature and pressure under which it is measured, it is usual to correct the volume of gas recorded by the meter to the standard temperature of 60 deg. Fahr. and standard pressure of 30 in. of mercury.

The Table Photometer.—Within the last five years the bar photometers at the London testing stations have been replaced by table photometers. In the table photometer devised and prescribed for use in the official testing stations by the Gas Referees candles have been replaced as a standard of light by A. G. Vernon Harcourt's Pentane Lamp (fig. 50).

Pentane is a highly-inflammable liquid obtained by distillation from American petroleum. The saturator (A) of the lamp is partly filled with liquid pentane, and is connected by indiarubber tube to the burner (B). When allowed free contact with air pentane rapidly vaporises, but the mixture of air and vapour being heavier than air, it sinks by its own gravity down the rubber tube and can be ignited at the burner. The rate of flow, and consequently the height of the flame, can be regulated by the cock S_2, or by checking the ingress of air by the cock S_1, or by lowering the damper (D).

The height of the flame is adjusted so that its tip is about half-way between the bottom of a mica window and a cross-bar provided at the back of the lamp. The metal chimney (C) is fixed at such a height above the steatite burner that it leaves a portion of the flame exposed, which emits a light of exactly ten candle-power. The portion of the flame not concealed by the metal chimney is partly surrounded by the metal shield (E), which does not, however, cut off any of the light from the exposed flame, which is thrown towards the photoped.

The table photometer used in the London testing-stations is shown in plan in fig. 51. Instead of burning the gas to be tested at a rate of 5 cubic ft. per hour, the flame of the Argand burner is adjusted until it emits a light of exactly sixteen candles; the rate of gas consumption required to obtain this intensity of

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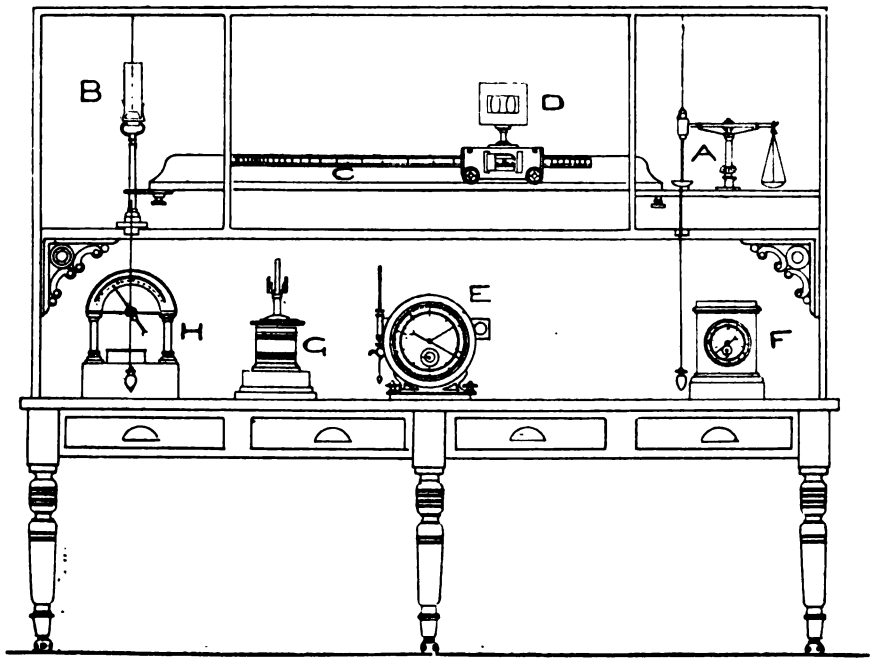

Fig. 49.—Bar Photometer with Standard Candles.

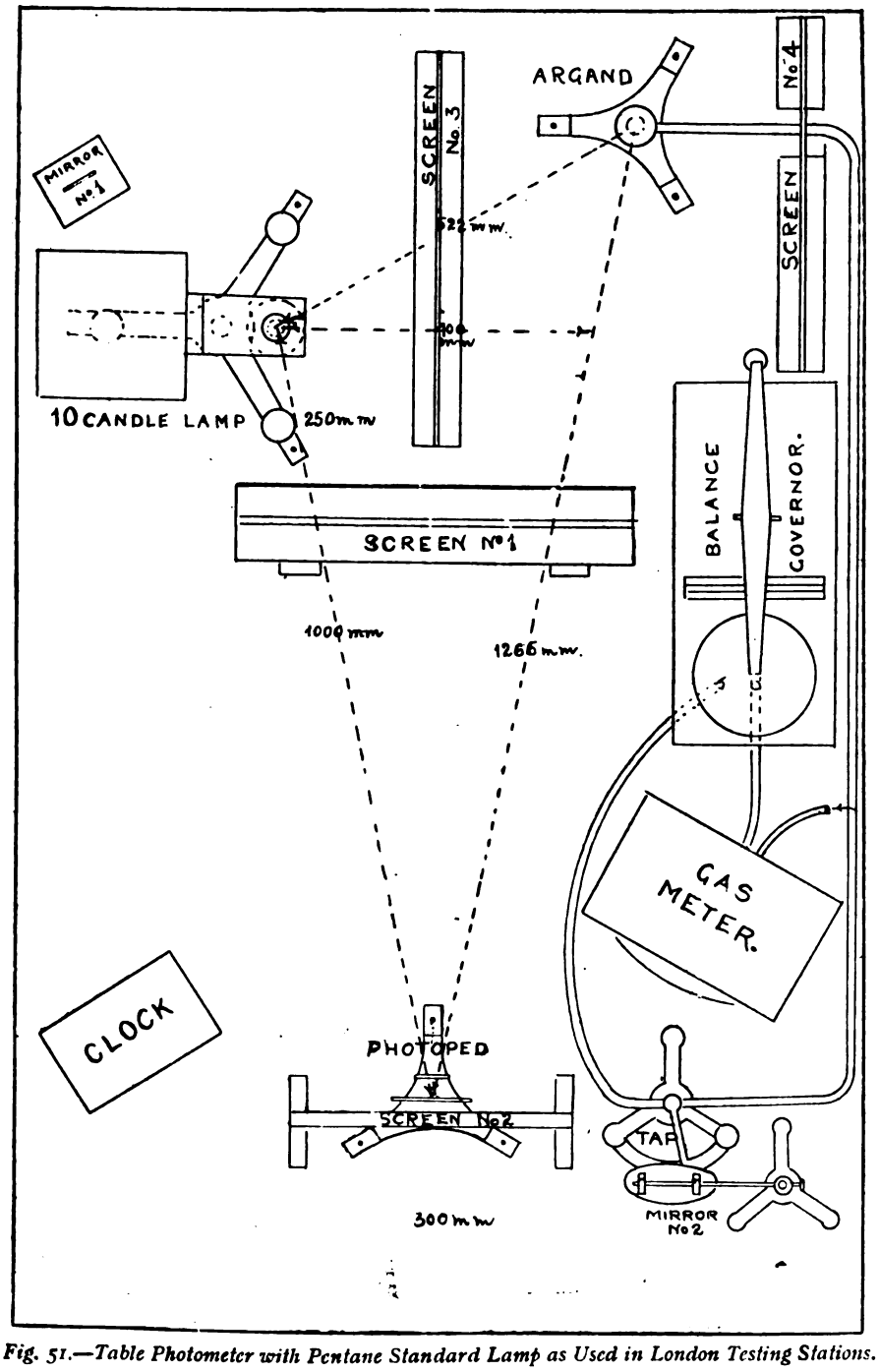

Fig. 51.—Table Photometer with Pentane Standard Lamp as Used in London Testing Stations.

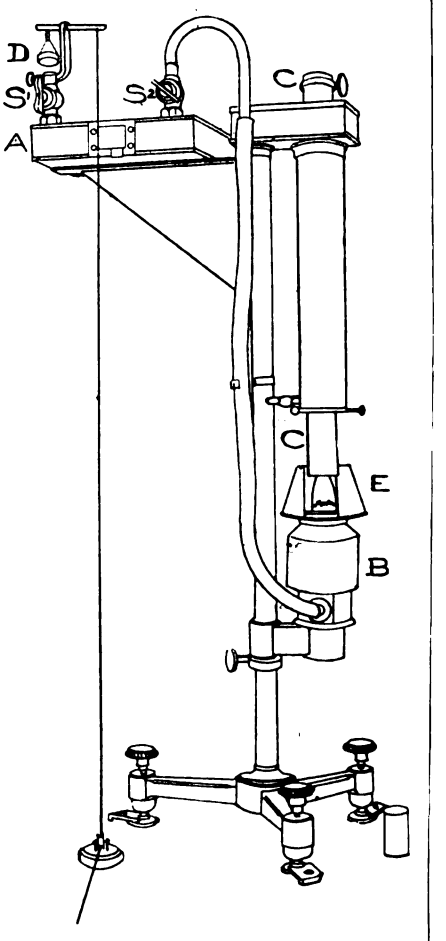

Fig. 50.—10-Candle Pentane Lamp.

light is then recorded, and a calculation is made to ascertain the proportional intensity of light which would be obtained with a rate of consumption of exactly 5 cubic ft. per hour.

Instead of a greased disc being used to ascertain when the intensity of the light thrown by the gas flame and by the pentane flame upon a given spot is identical, a piece of white unglazed paper clamped in the photoped is used, and the gas flame is adjusted until the photoped paper is seen to be uniformly illuminated. The distances of the 10 c.-p. lamp and the gas flame are so fixed that when the gas flame has an illuminating power of sixteen candles the intensity of the light thrown upon the photoped from the two sources shall be equal.

The photometer is used in a dark room, and suitable black screens are provided to prevent extraneous light interfering with the light thrown upon the photoped. Screen No. 1 (fig. 51) has orifices which allow the light from the burners to pass to the photoped without interference. The mirrors are provided merely to facilitate adjustment of the pentane flame and to throw light upon the gas-regulating tap.

Pressure.—The pressure under which the gas is supplied is ascertained by means of a water-gauge. From time to time tests are made in the street lanterns by the gas examiners, the burner and governor being removed and the pressure-gauge screwed in its place. One-tenth of an inch is deducted from the observed pressure in order to allow for the difference in height between the gas lamp and the gas main. The minimum pressure permitted in London between midnight and sunset is equal to a column of six-tenths of an inch of water, and between sunset and midnight to a 1-in. column of water.

Sulphuretted Hydrogen.—The gas is required to be completely purified from sulphuretted hydrogen, the company being liable to a heavy penalty for every day on which this impurity is detected in the gas distributed to consumers. The test for sulphuretted hydrogen consists in allowing 10 cubic ft. of gas to flow at a rate of about 0·6 cubic ft. per hour through an apparatus in which are suspended slips of white bibulous paper impregnated with acetate of lead. The presence of even a minute proportion of sulphuretted hydrogen in the gas causes a brown or black stain to appear on each of the slips

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Sulphur Compounds other than Sulphuretted Hydrogen.—In London the gas must not contain more than 17 gr. of sulphur per 100 cubic feet of gas between April 1 and September 30 in each year, nor more than 22 gr. in other months. To estimate the quantity of sulphur 10 cubic ft. of the gas to be tested are burned in a small Bunsen burner at a slow rate in an atmosphere impregnated with ammonia evolved from lumps of ammonium sesqui-carbonate. The products of combustion are led into a condensing-cylinder where the water vapour produced by combustion of the hydrogen and hydrocarbons in the gas is condensed, and the condensed water holds the sulphur compounds, which are oxidised during combustion, and which enter into combination with the ammonia, in solution. When 10 cubic ft. of gas have been consumed the gas is automatically shut off, and the quantity of sulphur in the condensed liquid is subsequently estimated by chemical analysis.

Ammonia.—The proportion of ammonia in the gas must not, in London, exceed 4 gr. per 100 cubic ft. of gas. The quantity of ammonia present is found by allowing 10 cubic ft. of the gas to pass at a slow rate through a glass cylinder containing glass beads, moistened with 50 septems of dilute sulphuric acid of a known strength. The acid combines with the ammonia present in the gas to form sulphate of ammonia, and by estimating the quantity of uncombined acid remaining in the cylinder after 10 cubic ft. of gas have passed through it, the quantity of acid neutralised by the ammonia, and consequently the quantity of ammonia present in the gas, is obtained.

More detailed information relating to the chemical examination of gas cannot be given in these columns, but the "Notification of the Gas Referees," containing the official instructions given to the London gas examiners with regard to the tests for illuminating power, purity, and pressure, may be obtained from Messrs. Eyre & Spottiswoode.

GENERAL BUILDING NEWS.

NEW CHAPEL AT BLAIRS COLLEGE, ABERDEEN.—The new chapel at St. Mary's College, Blairs, which forms a section of the scheme of building extension which has been in progress there for several years, was opened on the 23rd ult. The chapel is not yet absolutely finished as a building, an addition yet to be made being a spire, the erection of which is to be proceeded with at once. The chapel is the gift of Mgr. James Lennon, Liverpool, and when completed will have cost close upon 12,000*l.* It is the design of Mr. Robert Curran, architect, Warrington, and is in the style of the middle period of Gothic architecture. Several features meet the eye of the worshipper inside the chapel; for instance, the richly-carved oak and pitch-pine woodwork, the stained-glass windows in the western gable behind the altar, and the altar. The altar, the work of Messrs. Pearse & Sons, Dublin, is specially worthy of notice. The front is of white Carrara marble, the outstanding feature of the main centre panel being a representation in high relief of Leonardo da Vinci's conception of "The Last Supper." The panels in the octagonal wall behind the altar will in course of time be filled in by a reredos. A set of Stations of the Cross in oaken frames—fourteen pieces in all—is the work of Messrs. Mayers & Co., of Munich and London.

STEEPLE, FOOT'S CRAY CHURCH, KENT.—A new steeple has just been added to the parish church of Foot's Cray, Kent. The work of construction was entrusted to Messrs. Stebbings & Pannett, of Foot's Cray and Sidcup, and they have carried out the designs of Mr. Boucher, of the firm of Drake & Boucher, architects, Rochester. Advantage was also taken of the occasion to have the peal of five bells retuned by Messrs. Gillett & Johnson, of Croydon, and rehung in the steeple.

EMMANUEL CHURCH, NOTTINGHAM.—The completion of Emmanuel Church, Woodborough-road, Nottingham, was commemorated on the 24th ult., when the new baptistry, clergy and choir vestries, which for some time past have been under construction, were dedicated. The additions are at the west end of the church, extending up to the western boundary of the site, and consist of a baptistry, 18 ft. by 23 ft.; a choir vestry, 15 ft. by 27 ft.; and a clergy vestry, 12 ft. by 13 ft. The baptistry gives accommodation for thirty-eight additional seats. The interior walls of this part and of the entrances are faced with red Bulwell bricks, with blue brick in patterns to correspond with the rest of the church interior. The dado consists of the evangelistic symbols and heads of the great apostles to the Jews and to the Gentiles, carried out in glass mosaic, arranged in panels. This dado has also been carried throughout the aisles and transepts of the church. The ornamental stencil work of the baptistry ceiling has not yet been completed, but the exterior is carried out in a similar manner to the rest of the church, Coxbench rock-faced stone being used for the walling, and Hollington stone for most of the facings. The roof and position of the baptistry are emphasised on the exterior by a metal cresting and foliated cross. Red tiles are used for roofing. The porch has timber gable work, and when completed will have two sculptured figures of apostles, one on each side, in niches. The works have been carried out from the designs and under the superintendence of Mr. Watson Fothergill by Messrs. Williamson & Co.—*Nottingham Guardian.*

ST. COLUMBA CHURCH, GLASGOW.—St. Columba Church, plans for which have just passed the Dean of Guild Court, is of considerable interest to the Highland community of Glasgow as being the only church in the city in connexion with the Church of Scotland in which the services are held in Gaelic. The new church is composed of nave and transepts, and accommodates close upon 1,100 sitters. There are galleries in the transepts, and a gallery at the end of the nave. The other accommodation includes a hall to accommodate 350, a smaller hall for 120, session-house, vestry, choir vestry, ladies' room, and kitchen. A church officer's house is also provided. The organ is divided, and placed in arched chambers on each side of the chancel, while the pulpit is placed on the one side of the nave, outside the chancel. A spire, rising to a height of 200 ft., forms a conspicuous feature, the spire having pinnacles and belfry stage for bell, and with niche and canopy in which is placed a statue of the patron saint, St. Columba. The architects are Messrs. William Tennant and Fred V. Burke, and the building will cost about 15,000*l.*

CHURCH, CLEVELAND, YORKSHIRE.—On the 30th ult. the Right Rev. F. R. Blunt, D.D., Bishop of Hull, consecrated a new church at Carlin How, in the parish of Brotton-in-Cleveland. The church, which contains seating accommodation for 340 worshippers, has cost between 2,200*l.* and 2,300*l.* The contract was carried out by Messrs. Cruddas & Sons, Guisborough. The church, which has been built from designs supplied by Messrs. Hicks & Charlewood, architects, Newcastle, is of red bricks, with terra-cotta facings. It has a single aisle running from the main entrance to the chancel, and is flanked on either side by bays, the arches leading to the transepts being supported on brick pillars. An organ-chamber and vestry have been constructed on the north side of the chancel.

CHURCH OF ALL HALLOWS, EASTON, BRISTOL.—The new Church of All Hallows', Easton (in connexion with All Saints', Bristol), was consecrated recently. The scheme provides for a building capable of accommodating 800 worshippers, but this has not yet been completed, the work accomplished including choir, sanctuary, north and south transepts, chapel, and three bays of the nave and aisles. The walls are faced externally and internally with red Pennant stone, Bath stone being used for the dressings, and an open timbered roof has been provided. The chief feature of the church is the apsidal termination of east end, which has an ambulatory around it. The choir and sanctuary are large and lofty, the apparent height being increased by the lofty arcades between the choir and the transepts. There is a fine altar, but the choir stalls have not yet been executed, and the pulpit is a temporary one. The contractors for the building are Messrs. R. Wilkins & Son, and the architects are Messrs. Crisp & Oatley, of Bristol.

CENTRAL TECHNICAL SCHOOL, LIVERPOOL.—The new Central Technical School and Museum, which was recently opened by the Duke of Devonshire, was designed by Mr. E. W. Mountford, of London, and the contractors for the buildings were Messrs. Joshua Henshaw & Sons, of Liverpool. The site comprises 2,900 square yards, and the height of the elevation to Byrom-street is 84 ft. The basement, ground floor, and first floor are occupied by the offices, lecture-halls, and classrooms of the technical school. The two upper floors are museum galleries, and the effect of this extension is to enlarge the museum to three times its former size. The chemical department of the technical school is, however, placed at the top of the building in a cross gallery specially designed for the purpose. It comprises a spacious laboratory. On the top of the building also is an observatory, fitted with an equatorial telescope and transit instruments for the use of the Nautical College. The building is constructed of Darley Dale sandstone. Ancaster stone, of finer and softer quality, is used for the bases and capitals of the pillars of the interior. This stone was quarried at Grantham, Lincolnshire. The steps and landing are of fine-grained Shepley flags, obtained near Huddersfield. The main entrance from Byrom-street conducts to a vestibule and hall, paved with white and grey marble, and decorated with pillars of Devonshire marble from Torquay. The grey marble used for the panelling of the walls is from the Ashford Quarries, Derbyshire. Irish red marble, from Cork, has been used for the fireplace, above which is a sculptured panel of alabaster from Uttoxeter, the design being adapted from the armorial bearings of the Liverpool Corporation. The wood used for the lofty panels in the lecture-hall and throughout the building is Canadian whitewood. Oak has been used for the doors and panels in the hall and corridors, and pitch pine for the floorings. Messrs. Paterson & Son carried out the structural woodwork. The woodwork fittings were executed by Messrs. Brown & Backhouse. The general and fibrous plaster-work was entrusted to Messrs. J. Tanner & Son, and was carried out under the direction of Mr. Arthur Chute. In the entrance-hall and lecture-hall are reliefs by Mr. Pomeroy, of London, illustrating the development of shipbuilding and technical crafts. These were coloured by Mr. R. Anning Bell. The exterior sculptures are also by Mr. Pomeroy. Those over the main entrance represent Art holding up a mirror to Nature, and Science, veiled, holding a crucible. The groups in the pediments facing William Brown-street represent respectively Minerva (typifying the wisdom of the city) presiding over the education of the community, and Liverpool (a figure holding a globe and sceptre), supported by figures typical of its commerce and industries. Sculptured figures on the pediments of the arches represent Astronomy, Navigation, Geography, and Agriculture. The wrought-iron gates at the front entrance are by Messrs. Singers, of Frome; those at the entrance to the area in William Brown-street by the Bromsgrove Guild of Arts and Crafts; the iron railings and gates in Clayton-street by Worrall, of Liverpool; and those in the archways leading to the interior courtyard by Messrs. Ramsden & Carr, of Battersea. The standards for the electric lamps on the balustrade at the Byrom-street entrance were modelled by Mr. Pomeroy, and cast in bronze by Messrs. Singers. The electroliers in the entrance-hall, as well as the firegrates in wrought-iron and brass in the vestibule and committee-room, are by Mr. Nelson Dawson, of London. The heating and ventilation of the building has been carried out on the Plenum system by Mr. W. Key, of Glasgow. The electric lighting and power equipment was carried out by the Corporation electric lighting department. The equipment of the mechanical and electrical engineering laboratories is by Messrs. Sloan & Lloyd Barnes. The building was illustrated in the *Builder* for August 8, 1896, and January 2, 1897.

NEW ALTARS, PARISH CHURCH, CARNDONAGH, IRELAND.—The church of the Sacred Heart, in Carndonagh, has recently been supplied with three new altars. In the high altar, which stands 5 ft. above the ground floor, the body is supported on double ebony pillars with central annulets and turned caps and bases. The centrepiece consists of three Romanesque arches, with walnut tablets of "I.H.S." inserted. The return ends of the altar have five Gothic arches, with Scotia mouldings around each. Underneath are five squares with chamfered mouldings at the bottom. On each end of the return stand two canopies, with Gothic arches, supporting a spire and having four urns, all with crocket facings, with the central one carved on top. At each side of the small canopy is a double reredos with four large buttresses of polished oak and six ebonised pillars between three Gothic arches, having carved crockets on top. In the centre is a tabernacle, with brass safe, having two ebonised columns in front, on which stands a canopy supported by four similar pillars of the same material, with polished carved annulets and caps. The top ends in an octagon spire supporting a large carved cross, with medallion under. The central canopy is 15 ft. high and extends to the ceiling. The body part of the altar of the Virgin is supported on four ebonised pillars, with caps, annulets, and bases of carved and polished oak. The central panel on this altar is composed of double-moulded quatrefoil, with carvings on walnut ground. The Sacred Heart altar is of polished oak, with ebonised pillars, caps, annulets, bases, &c., on which is a carved panel of the Heart. A statue stands on each of these two altars. On all the altars are carved brackets of polished oak, supported by ornamental caps for vases and small statues. A statue of carved wood also stands on each side of the high altar. The Communion rail round the altars has a length of 60 ft., and is formed of polished Romanesque arches, with moulded abaci, supported by turned caps, annulets, and bases of ebonised pillars, with chamfered bottoms, the rail being carved the whole way through. Over the arches are mouldings of ebony balls. The top is a 6-in. walnut capping, finely polished. The painting and panelling were carried out by Mr. M'Closkey, of Londonderry. The altars were designed, executed, and erected by Mr. C. Bull, of Dublin, who was assisted in the work of erection by Mr. M. Doherty, of Carndonagh.

THEATRE, STOCKBRIDGE, EDINBURGH.—The new theatre situated in St. Stephen's-street, Stockbridge, is practically finished, and will shortly be opened. Nearly the whole accommodation is on the ground flat, there being only one end gallery. The auditorium measures about 90 ft. by 76 ft., covered by one arched steel roof, and the floor space is subdivided into three divisions, pit, pit-stalls, and orchestra-stalls, with promenades and boxes at each side. The stage, which measures about 55 ft. by 45 ft., has a proscenium opening 30 ft. in width, with the usual flies and grid constructed overhead. There are four entrances, and the building can be emptied of its audience in one and a half to two minutes. There is a large entrance hall measuring about 70 ft. by 25 ft., a number of dressing-rooms for actors and actresses, ladies' retiring-room, and other conveniences. It is lighted by electricity,

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with gas in reserve, and is ventilated by large electrically-driven fans. The architect is Mr. P. Marwick, of Edinburgh.

FOREIGN.

FRANCE.—A new post office is to be built at La Rochelle at a cost of 253,000 francs.——A committee has been formed for the erection at Dijon of a monument to Bossuet in some public situation (not yet decided on) in the town. M. Maturin-Moreau and M. Paul Gasq are to be the designers.——An important monument has been erected at Chartres, and was inaugurated on Sunday the 31st ult., to the memory of the soldiers of the Department of the Eure-et-Loire who fell in the Franco-German war. The monument, which stands at the entry to the Promenade des Charbonniers, consists of a triumphal arch between two pylons and crowned by a *fronton* decorated with the armorial bearings of Chartres, Châteaudun, Dreux, and Nogent-le-Rotrou. Beneath the arch is a figure personifying the Republic, and waving a flag. On each side of the arch are two statues, an artillery-man on the right, a mobile on the left; in front of the arch is a circular basin supplied from two lion's heads sculptured on the pylons. The general design is the work of M. Néuot, and the sculptors are MM. Henri Allouard, Loiseau-Bailly, and Boverie.——M. Chabas, the painter, has just completed the most important part of the decoration of the Mairie of Vincennes, which is still to be completed by two military subjects originally commissioned from M. Dupray, but now to be carried out by M. Arus.——The Municipal Council of Paris is occupied with the arrangement of the Victor Hugo Museum, which will occupy the house at 6, Place des Vosges, formerly inhabited by the poet. On the first floor will be placed pictures and engravings inspired by or relating to the works of Victor Hugo. On the second floor will be drawings, and also furniture, made by the poet himself; and on the third floor is to be a restoration of the room in which he died at Avenue d'Eylau.——A tapestry, after a cartoon by M. E. Toudouze, has just been placed in the Palais de Justice at Rennes. It is about 20 ft. square, and represents the marriage of Anne of Brittany to Charles VIII., at the Château de Langeais, in 1491.——A monument to Dugueselin, by M. Frémiet, is shortly to be unveiled at Dinan. It consists of an equestrian statue.——The Municipal Council of Rennes has voted a sum of 300,000 fr. for a new museum of painting, the design for which will be the subject of a public competition.——An international art exhibition is to be held at Nice, from January 10 to the end of March next year.——Mme. Gounod, the widow of the composer, has presented to the town of Marseilles the bust of the eminent composer executed by Carpeaux, which will be placed in the principal theatre.——The death is announced, at the age of sixty-six, of M. Dulac, architect, a former member of the Association Provinciale des Architectes.——The death is also announced, at the age of fifty-one, of M. Henri Degrève, architect, and member of the Société Centrale. He was a pupil of Achille Huë, and gained the first premium in the competition for the Hôtel de Ville of Meulan. He had exhibited at the last Salon a remarkable design for a house to be built at Margival.

AUSTRALASIA.—The council of the Royal Victorian Institute of Architects has decided that the age at which a candidate may submit himself for examination to qualify as an associate shall be changed from twenty-one to twenty years of age.——The death of Mr. R. Gordon Hyndman, a well-known Melbourne architect, is announced.——A new church erected at Cowwarr, Victoria, has recently been completed and opened.——The Crown Law offices in Sydney are about to be considerably enlarged, and the plans for the additions have already been adopted.——The Government has decided to carry out a number of improvements at Garden Island, Sydney Harbour, including buildings and harbour accommodation generally.——Competitive designs are about to be invited for a building to house the lending-library branch of the free library, now installed in the Victoria Markets, Sydney.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. R. E. W. Berrington, civil engineer, of London and Wolverhampton, announces that his son, Mr. Ernest Berrington, has taken up residence in London as the manager of their London office at 28, Victoria-street, S.W.

COMMONS AND FOOTPATHS PRESERVATION SOCIETY.—A meeting of the Executive Committee of the Commons and Footpaths Preservation Society was held on Thursday, the 31st ult., at 1, Great College-street, Westminster, under the presidency of the Right Hon. G. Shaw-Lefevre. It was reported that eminent legal advice had been obtained by the Society as to the recent enclosure of Stonehenge. It appeared that several clearly defined tracks leading to the monument had been obstructed by the erection of a barbed-wire fence, and the Society was advised that *primâ facie* there was a strong case for the existence of public rights of way over these tracks. The Committee resolved to petition the Local Authorities to protect the public rights involved, and letters from eminent archæologists were read protesting against the enclosure of Stonehenge on the ground that the character of the monument had been entirely altered by the existence of a high barbed-wire fence in close proximity to the remains. It was further pointed out that the stones could be amply protected from injury, without enclosure, by means of the Ancient Monument Protection Acts. The solicitor stated that the obstruction to the footpath leading from Sewardstone to Epping Forest had now been removed by the Waltham Holy Cross Urban District Council at the instance of the Society. A mass of evidence has been obtained by the Committee and laid before Mr. Rawlinson, K.C., whose opinion was strongly in favour of the existence of a public path. As a result, the District Council had held a local inquiry and had resolved to cut the barbed-wire fence forming the obstruction. Much gratification was expressed at the action of the District Council, which has secured the preservation of one of the most beautiful means of access to Epping Forest. A further grant of 10*l.* was made by the Committee to the expenses of an action to secure the preservation of a path at Wadborough, Worcester, and grants were confirmed with respect to commons cases at Lodsworth, Leagrave, and Okehampton. It was reported that counsel's opinion had now been received with reference to the quarrying away of cliff footpaths in the Isle of Portland. The Society were advised that the custom was illegal, and it was determined in the first instance to request the District Council to take immediate steps for the protection of the paths, some of which are rapidly disappearing. The secretary's General Report embraced particulars of nearly 150 cases with which the Society is dealing at the present time. These included disputes respecting footpaths, commons, village greens, and roadside waste in thirty-five counties.

ARBITRATION CASE.—The award has been made in the arbitration proceedings of July and August last, between Messrs. A. Krauss & Son and the Corporation of Bristol, over the enlargement of the lunatic asylum. Messrs. Krauss & Son claimed 4,734*l.* on account of loss of profits, increased cost of labour, supervision and establishment charges, depreciation of plant, and loss of interest on capital, through alleged delay of the Corporation in delivering certain materials for the work. Mr. H. R. Withycombe, the arbitrator named in the contract, heard evidence for several days. Mr. James Inskip appeared for the claimants, and Mr. B. R. Vachell (instructed by Mr. W. H. Wise) for the respondents. The award is that the Corporation shall pay 120*l.*, and as that is less than the amount which they offered before arbitration, the claimants are to pay cost of the reference and the arbitration. The contract price was 36,927*l.*—*Bristol Times.*

REREDOS, ST. MARY'S, LEIGH WOODS, BRISTOL.—The reredos at St. Mary's Church, Leigh Woods, to the memory of the late Mr. John Harvey, of Leigh Woods, has just been dedicated. The reredos is of alabaster and gilt, with oak super-altar, and near the latter is to be inscribed a plate bearing the inscription. In the reredos there are nine panels, carved, each containing a sacred monogram or emblem of the Passion. The super-altar and panelling on each side of the altar are of fumigated oak. The architect is Mr. G. F. Bodley, A.R.A., and the sculptors were Messrs. Flint Brothers, of London; the church decorators and gilders employed on the work being Messrs. W. O. and C. Powell, of London.

GLASGOW BUILDING TRADES' EXCHANGE.—The annual meeting of the Building Trades' Exchange of the City and District of Glasgow, Ltd., was held on the 29th ult. in the Exchange, Gordon-street, Colonel Bennett presiding. The secretary (Mr. David Cook, writer) submitted the eighth annual report. It stated that the treasurer's accounts showed an income of 701*l.* 7s. 9d., and an expenditure of 666*l.* 10s. 5d. A further sum, however, had been earned, so that the total credit balance on the year should be 44*l.* 17s. 4d. Of this balance the executive had devoted 3*l.* to depreciation of furniture, and written 10*l.* off the preliminary expenditure in connexion with the formation of the Exchange, leaving a balance of 31*l.* 17s. 4d. to be carried to profit and loss account. The executive recommended a dividend of 4 per cent. on paid-up capital. During the year there had not been any work of particular moment to which the Exchange could devote its energies, with the exception of the scheme for the extension of the Glasgow and West of Scotland Technical College. Exchange members had contributed towards that scheme 2,053*l.*, and there was a possibility that this sum might be considerably augmented. On the motion of the Chairman, seconded by Mr. Donald, the report was adopted. The vacancies on the Council were afterwards filled up, and Messrs. Paterson & Benzie, C.A., were reappointed auditors.

CAPITAL AND LABOUR.

THE BUILDING TRADE.—The decline in the building trade of the country generally, which is attributed to the effect of the war and the continued high price of materials and labour, has caused several associations connected with the National Federation of Building Trade Employers to give notices to the workmen for reductions of wages. At Birmingham the trade-union representatives of the carpenters and joiners, masons, bricklayers, plasterers, and labourers have each been notified of a reduction in wages, to come into operation next year.

LEGAL.

THE WEST-END BUILDING DISPUTE.

THE case of Bailey *v.* Lewis was again mentioned to Mr. Cozens-Hardy in the Chancery Division on the 1st inst., in which Mr. Lewis, the draper, had been committed for contempt of Court in not complying with an order of the Court to remove certain buildings in Hollis-street, Cavendish-square, in breach of a covenant with the ground landlord, the trustee of the Portland Estate. The case was reported in last week's issue of the *Builder*.

Mr. Eve, K.C., now put in an affidavit made by the defendant, expressing his regret for what had taken place, and adding that his reason for not complying at once with the order of the Court was that he was in the hope and expectation that satisfactory terms would be arranged which would avoid the necessity of carrying out the order. The learned counsel added that the plaintiff was willing to accept an undertaking from the defendant to put in plans and specifications which would possibly render the carrying out of the order needless.

Mr. Vernon Smith, K.C., on behalf of the plaintiff, agreed to this.

His Lordship, in accepting the apology in the terms of the affidavit, and ordering the plans to be lodged within a fortnight, again remarked that the defendant had committed an act of gross disobedience to the order of the Court.

THE LONDON BUILDING ACT, 1894:

TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal have made an Order in the Appeal made by Mr. C. W. Matthews, and heard on the 25th ult., against the certificate of the Superintending Architect of Metropolitan Buildings, dated September 17 last, under Sections 22 and 29 of the Act, defining the general line of buildings on the western side of West Hill, Highgate, between Millfield-lane and Parliament Hill Fields, in which street he further certifies the building in question to be situate. The Tribunal allow the appeal, and decide and determine that the general line of buildings on the western side of West Hill, Highgate, between Millfield-lane and the south-eastern corner of No. 1, West Hill, is as defined on the plan annexed to their Order by a strong green line; and further, they make no order as to costs.

CASE UNDER THE 1894 BUILDING ACT.

AT Marylebone Police-court recently, Alfred Bush, builder, of 6D, Ridgmont-street, Gower-street, appeared to a summons, issued at the instance of Mr. Arthur Ashbridge, District Surveyor for Marylebone, for making, in the erection of a building at the corner of Paradise-street and Ashland-place, Marylebone, default to comply with a notice of irregularity under the Building Act. Mr. D. P. Andrews supported the summons on behalf of the London County Council, and Mr. W. Moyses, barrister, defended, representing the Portland Industrial Dwellings Company, the owners of the building in question. Mr. Andrews said that the building was a large one, and was intended for the occupation of persons of the industrial classes. It was agreed on both sides that, the building being over 125,000 cubical feet in extent, Section 68 of the London Building Act applied. It was provided by that section that in every public building, and in every other building of more than 125,000 ft. of cubical extent, which was constructed or adapted to be used as dwelling-houses for separate families, the floors of the lobbies, corridors, landings, and flights of stairs should be of fire-resisting material and carried by supports of a similar material. But it was also contended by the complainants that the building, being over twenty-five squares, or, in other words, covering more than 2,500 superficial feet, should conform with Section 74, Sub-section 3, which required that all the floors of the rooms, as well as those of the lobbies, &c., should be fireproof. Apart from that matter no exception was taken to the building. In all probability a paraffin lamp would be used in every one of the rooms in this building at night, and it was therefore of the highest importance that the floors should be fire-resisting. Mr. Moyses urged that Section 74, Sub-section 3, only aimed at large buildings like flats, containing three or four rooms, intended to be occupied by different persons, and with an outer door. The object of the company he represented was to solve the most acute problem of finding dwellings for the industrial classes in congested districts. Every one of the rooms in the building in question might be let off separately; at any rate, a weekly rent would be charged per room. They therefore thought it was oppressive and unreasonable to try and compel them to incur the great expense of making the floors of even the smallest rooms fireproof. As to the possibility of fire, he pointed out that in all probability gas, and

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not lamps, would be used by the tenants. Mr. Plowden, in deciding the case, said that the whole question seemed to be what was a fair meaning to be placed on the words of the Act that in every building "containing separate sets of chambers, offices, or rooms" there should be fireproof floors. In his opinion "separate sets" had nothing whatever to do with offices or rooms, but referred simply to chambers. Every kind of room, office, or set of chambers which was inhabited at all should therefore have fireproof floors. Consequently he held that this building contained sets of chambers or rooms, or, even if not sets, they contained rooms which required fireproof floors. His order would be that the defendant should comply with both Section 74, Sub-Section 3, and Section 68 of the Act, and pay 5*l.* 5s. costs.

THE ARCHITECT AS ARBITRATOR.

ON the 4th inst., before the Court of Appeal (composed of the Master of the Rolls and Lords Justices Stirling and Mathew), the case of W. Belcher and another (trustee, &c.) *v.* The Roedean School Site and Buildings, Ltd., and another, was heard, on the appeal of the Roedean School Site and Buildings, Ltd., and of Mr. J. W. Simpson, an architect, from orders of Mr. Justice Lawrance in Chambers, dated August 8, 1901.

Mr. Ralph Neville, K.C., and Mr. Leigh Clare appeared as counsel for the appellants; and Mr. Reginald Bray, K.C., and Mr. Hudson for the respondents.

Mr. Neville said that the Roedean School Site and Buildings, Ltd., was a company established for the purpose of erecting the buildings of a well-known school at Brighton, and the respondents on the appeal were a gentleman named Belcher and also a Mr. Davis, the trustee in the bankruptcy of the contractors, Messrs. Peters, Peter, & Son, who had contracted to do some of the brickwork in the erection of the schools. The appeal was from a decision of Mr. Justice Lawrance, revoking the submission to the architect in the builder's contract. The learned Judge revoked the submission altogether, and as he (counsel) understood the ground of the learned Judge's decision, it was, to put it shortly, based on the fact that there was litigation pending between Mr. Belcher and the architect, and that the case came within the meaning of the decision of a Divisional Court in "Baring Brothers *v.* Doulton & Co.," that litigation pending between the architect and a party to the contract was sufficient ground for the revocation of the submission. In that case, however, the litigation which was pending was commenced by the architect himself against one of the parties to the contract; in the present case the litigation was commenced by one of the parties against the architect with the express view, as he (counsel) submitted, of putting an end to his acting as arbitrator under the contract.

Mr. Bray remarked that such a thing was never suggested to Mr. Justice Lawrance.

Mr. Neville: Well, I will only say this, that if this gentleman is successful in determining the submission to the architect by the proceedings he has instituted, there is a sure and simple method open to all parties in cases of this kind if they do not wish the arbitration to go on in the usual way. The learned counsel went on to state that the contract between the company and the contractors, Messrs. Peters, Peter, & Son, was entered into on February 25, 1897, the contract price being 43,580*l.* Mr. J. W. Simpson was the architect named in the contract. There was very little of the contract that he need call attention to. Clause 4 provided that the work should be completed to the satisfaction of the architect on or before September 1, 1898, with penalties of 10*l.* a day for delay. Clause 16 provided for the payment of the contract price by instalments upon the architect's certificates, 8 per cent. being payable until 4,500*l.* was in reserve, and after that for full payments on the certificates. Clause 20 made provision for the determination of the contract in certain circumstances, one of which was the bankruptcy of the contractors. Another clause gave the building owners power to determine the contract in case the work was not proceeded with to the satisfaction of the architect. Clause 26 was the arbitration clause, which provided that in the event of any dispute arising between the Company and the builders, they should be referred to the architect, whose decision should be conclusive and binding upon both the parties. When September 1, 1898, arrived, the buildings were very far from completion. It seemed that the builders were short of funds, and they obtained loans from different people on the credit of the contract.

Mr. Bray: This does not appear in any affidavit.

Mr. Neville: It appears in the accounts then.

Mr. Bray said it was quite immaterial to the case.

Mr. Neville: I do not think we can get on without mentioning that there were persons who advanced money besides Mr. Belcher. The learned counsel continuing said that Mr. Belcher advanced money to the builders and got a charge on the contract in his favour. The first notice of any charge was in September, 1898, and again in January, 1899, there was notice of a charge. On January 27, 1899, the architect gave the contractors notice to proceed under the 20th clause of the contract, and on their failure to proceed according to his satisfaction, the building owners on February 1, 1899, served notice to determine the contract under that clause. On the same day the contractors presented a petition in bankruptcy which was followed by a receiving order. Then the work was taken over in accordance with the terms of the contract by the building owners and completed under the inspection of the architect. On June 27, 1901, the architect issued his final certificate, which showed a balance due to the contractors of 350*l.* 18s. 5d. There was accompanied with it a statement of account by the company, in which they showed a claim for penalties for non-completion of the work in due time and damages for non-completion amounting to 1,250*l.* 7s. 5d. That amount was arrived at after deducting from the claim the amount due to the contractors under the final certificate of the architect, and a certain amount which had not been paid although certified for previously. Those accounts were sent to the trustee in the bankruptcy of the contractors and also to the other persons from whom notices of charges had been received. The solicitors to the trustee refused to accept the certificate issued by Mr. Simpson on the ground that the contractors had a large claim against the company for improperly determining the contract. On July 6, 1901, the solicitors to the company wrote to the architect asking him to make an appointment as arbitrator under the contract, and the architect appointed July 23 for the first sitting. The trustee refused to acquiesce in the arbitration or to submit to the jurisdiction of Mr. Simpson as arbitrator. Mr. Belcher's solicitors also wrote to Mr. Simpson on July 19, 1901, stating their surprise that the balance due to the contractors under his certificate was only 350*l.* odd, and that their client had advanced large sums of money to the contractors on the faith of assurances given to him by Mr. Simpson as to the retention fund of 4,500*l.*, and so on. Subsequently Mr. Belcher commenced an action against Mr. Simpson for damages for misrepresentation and fraud, and he (Mr. Neville) submitted that this litigation was simply started to bring the case within the decision of Baring Bros. *v.* Doulton & Co., and so put an end to the arbitration which Mr. Belcher did not like. A summons was afterwards taken out for an injunction to prevent the arbitration proceeding, and Mr. Justice Lawrance granted the injunction and revoked the submission to arbitration. The learned counsel argued that there was no ground for saying that Mr. Simpson was not a proper person to act as arbitrator under the contract, and that the action started by Mr. Belcher for which there was no justification was to bring the case within the decision of the Divisional Court before referred to. In the circumstances, he submitted that the orders of Mr. Justice Lawrance should be reversed.

Mr. Bray said that the action started by Mr. Belcher was a bonâ-fide one. Mr. Belcher was applied to by the contractors for money, and it was decided that he should provide the remainder of the money to finish the work. Mr. Belcher went with his solicitor to Mr. Simpson, and this gentleman assured him that the job was paying the contractors very well, and that he would be perfectly safe in advancing the contractors money for the rest of the job. The learned counsel said that the matter had been a most unfortunate one for Mr. Belcher, as he had advanced large sums of money to the contractors. He would be satisfied that any other qualified architect should act as arbitrator under the contract, but he submitted that Mr. Simpson, in the circumstances, was not the proper person to act as arbitrator. He suggested that as the amount said to be due to the Company was small, the arbitration should be ordered to stand over until the action against Mr. Simpson had been tried.

The Master of the Rolls in giving judgment said that in ordinary building contracts the architect was the person appointed to determine disputes between the parties. It was known that these disputes raised questions between the contractor and the architect. In many cases the architect as arbitrator had to determine when he had given say, a disputed order, whether he was right or wrong. The parties stipulated for not necessarily an unbiassed arbitrator. That being so, what materials were there in the present case to suggest that there would be any bias in the arbitrator beyond that ordinary or inevitable bias in other cases? Mr. Belcher, who was not a party to the contract at all, said that the architect had made representations to him which turned out to be so untrue that they must have been fraudulent at the time he made them. This was denied by the architect, and it was said on his behalf that there was nothing which could give any suggestion for fraud on his part. But it was said, however, that one of two parties who desired to avoid going to arbitration could, by making a most injurious charge against the arbitrator, at once oust his jurisdiction. His Lordship did not think that the Court ought to give effect to the objections given, because by opening the door to attempts to get rid of arbitration it would open the door to attempts to get rid of contracts. Mr. Bray had desired the Court to let the charge against the architect be decided by jury first and then come back to the question of arbitration. That, however, was not what the parties stipulated for. They stipulated for the determination of their disputes by a named person. He thought that the architect should be reinstated in his position as arbitrator, and that the arbitration should proceed.

The Lords Justices concurred, and the appeal was accordingly allowed with costs.

CASE UNDER THE WORKMEN'S COMPENSATION ACT, 1897.

THE case of Ayres *v.* Buckeridge came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 6th inst., on the appeal of the defendant (the employer) from the decision of the County Court Judge at Brentford in an arbitration under the Workmen's Compensation Act, 1897, awarding the applicant, the widow of a labourer who sustained fatal injuries through an accident while in the course of his employment, 292*l.* 10s. compensation. It appeared that the deceased man was employed by the foreman of the defendant to assist in the demolition of a building at Ealing. At the time the man was at work in Whitechapel, and it was arranged, in order that the rate of wages should be remunerative to him, taking into account that he would have to travel to his work, that he should be employed for eleven hours a day for five days in the week and for five hours on Saturday, making altogether sixty hours a week, and that his pay should be 7½d. an hour. The employment was not for any specified time, and the man was liable to be discharged at an hour's notice. The man was at work for four days, and on the fourth day met with the accident. He worked for eleven hours on each of the four days. The County Court Judge, in calculating the award of 292*l.* 10s., did so on the basis that this was the amount which the man would have earned if he had been employed for sixty hours a week at the rate of 7½d. an hour for a period of three years. The employer appealed, and on his behalf it was contended that the amount of compensation ought to be based on the amount of wages in fact received by the deceased man during the time that he was actually employed. The period of his actual employment was forty-four hours in the first week of the employment, and wages at 7½d. an hour for forty-four hours amounted to 1*l.* 7s. 6d. On this basis it was contended that the award ought to be for 214*l.* 10s.

At the conclusion of the arguments of counsel, their Lordships held that the learned County Court Judge had dealt with the case in accordance with the law as laid down by the House of Lords in the case of "Lyons *v.* Andrew Knowles & Sons," and dismissed the appeal with costs.

Mr. Atherley Jones, K.C., and Mr. Kisch appeared for the appellant (the employer), and Mr. R. M. Bray, K.C., and Mr. W. M. Thompson for the respondent (the widow).

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

12,307.—AN APPLIANCE FOR WATER-CLOSETS: *F. Beresford.*—The invention relates to a form of mechanism which works an inlet water-valve by means of the opening and closing of the seat-lid, on which is mounted a bracket having a ball or roller at the head. On the end of the valve-spindle is a double incline upon which the ball will act, whereby the valve will become quite opened. When the lid is half closed or half opened a spring in an air-chamber closes the valve, for which an air-cushion is provided. Rods and levers from the seat-lid will work the lid at the bottom of the pan.

12,317.—A FOUNDATION FOR FLOORING: *P. Tachard.*—A lower layer is made of an admixture of sawdust, thirty parts by weight, oxide of magnesium, thirty-five parts, and a solution of chloride of magnesium, four and a half parts, above that is spread a layer compounded of oxide of magnesium, asbestos, wood-meal, cale spar, chloride of magnesium solution, and some colouring matter in certain given parts; if only one homogeneous layer is employed the relative parts of the components are varied.

12,320.—WIRE FENCES: *W. Edenborn.*—The inventor feeds the wires lengthwise through hollow spindles, and the stay-wires between rollers and cam-rollers having an intermittent motion, whilst pawls will prevent the wires from returning; between the spindles are spring-fitted grooves in discs which take the stay-wires, and as their lengths are cut off the discs are caused to rotate so as to bring the stay-wires and the adjacent strand-wires together, a sliding head that is worked with a cam carries forks which cause the stay-wires to engage with the coiling-fingers which coil them about the spindles, and will straighten them. Confer also No. 8,343 of 1896.

12,331.—ELECTRICAL CONDUITS: *E. Schellbach.*—The outer casing of a sectional multiple conduit has its shell made of cement, &c., and has grooves or openings for taking tie-rods lengthwise; a lighter material is filled in the interior and is moulded with rounded openings. In another form the portion within consists of a casing having a movable top, and the tie-rods are fitted in the inner casing instead. The interior will serve for pipes laid upon pierced

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insulating-partitions and for naked wires to be drawn through the partitions.

12,380.—A WORKMEN'S TIME-RECORDER: *J. S. MacCoy.*—For stamping it with the date and time, the card, when it has been dropped into a shoot, is held with a pivoted detent against the printing-wheels, whilst a cam and hand-lever mechanism works a lever at the end of a platen that strikes the card. At the same moment the platen drives a punch which removes a piece from the card, a cam is raised to clear a pivoted pallet upon a vertical shaft by an arm which, with the hand-lever, works upon another arm, so as to wind up a train-controlled spring, thereby the cam is returned over the pallet, and by turning the shaft disengages the detent to which it is linked. A band between two winding-reels inks the type, the reels being driven in alternation by a shifting shaft having mitre-gearing at its end. The shaft is shifted by means of its two end levers beneath springs and a detaining latch which is tripped with a trigger.

12,392.—A CLAMP FOR CONDUCTORS AND FUSES: *Callender's Cable and Construction Co. and J. C. A. Ward.*—Two discs pressed together by a spring and an eccentric and mounted upon a pin, constitute the clamp; the spring is put under the lower disc, and above the other disc a forked eccentric is pivoted on a pin that works in a slot in the disc-pin; the disc-pin may, otherwise, be forked so that the eccentric can move between its legs.

12,418.—A ROAD SCARIFIER: *W. Thackray and W. L. Thackray.*—The two sides of the machine are joined with stays and mounted upon wheels; lateral bearing-bosses carry the shaft, and as the sides are constructed in parts they can be adjusted for their attachment to a traction-engine; double-ended prongs are keyed into levers upon a shaft, and the levers are linked to regulating-levers upon a shaft, whilst spring catches upon the former levers engage with recesses in segments upon the side plates; the steering-wheels can be carried by an axle which is fitted to an upright mounted in a bearing in the bridge-piece affixed to the sides.

12,436.—PROTECTION FROM FIRE: *J. D. Gould.*—The fire-alarm comprises a cable wherein a layer of some insulating material separates an outside conductor from an inside fusible conductor, wires connect the other ends of the conductors to the metallic ends of the reel, which takes the surplus cable, the ends being disposed in metallic connexion with the terminals of an electrical-bell circuit. When a fire breaks out near the cable, the inside conductor becomes fused, and as it makes its way through the insulating material effects contact with the outside conductor, so as to close the bell-circuit and raise an alarm.

12,446.—BRICKS FOR CEILINGS AND FLOORS: *F Alorecht.*—The bricks are fashioned with interlocking corrugations or waved ribs and grooves arranged lengthwise. They may also be hollow, for reducing their weight and for deadening sound.

12,475.—TOPS FOR CHIMNEY AND VENTILATING SHAFTS: *W. Mitchell.*—As an improvement upon No. 19,266 of 1897, and in order to prevent the top from being blown quite round by the wind, the inventor devises a brake-block that will hang freely in a light wind, but will be actuated by a breeze. When three chimney-pots are fixed upon one stack the two outside pots are elbowed into the top which is secured to the pot between them.

12,498.—LADDERS FOR SCAFFOLDING: *I. Szalay and J. Korom.*—At the upper ends of the ladder ends are sockets for the feet of the sections next above them, for fastening the sections to one another parallel-wise are used screwed shackles and cross-braces that are to be bolted to one another as well as to the sides of the ladders.

12,501.—A STAGING FOR USE IN CLEANING AND PAINTING WINDOWS, &C.: *I. Page.*—The apparatus consists of a frame covered with wire-netting which stands upon the window-sill and is secured with adjustable screw coupling-nuts or turn-buckles to hooks inside the room, jointed links secure the hinged back of the frame, and to the back are hinged folding side-wings which are also pivoted with catches on to the links.

12,513.—AN ARTIFICIAL STONE: *Wachtel & Co.*—The stone is made of coarse-grained and fine-grained sands in the ratio 2 : 1 mixed with lime, the former having been dried at a temperature of 100 deg. C. or higher, and made up with slaked lime to the consistency of a paste.

12,593.—DRAWING INSTRUMENTS: *H. E. Ablett.*—A set-square for drawing regular polygonal figures has each of its corners cut to the angle of a regular polygon which is bisected with a line of holes, the radius of the circumscribing circle is determined by means of the engagement of any hole with a fixed centre which has been struck on the paper, whilst the length of the side of the figure that corresponds with the given radius is obtained from the intersection of a line drawn from each hole to the edge of the set square; a detached and perforated strip is provided for drawing radii and circles.

12,605.—MEANS OF WARMING BUILDINGS: *J. Russell.*—The invention lies in the maintenance of the circulation of the heating vapour or steam by making a vacuum in the return portion of the system, and preventing the passage of the steam or vapour into the return pipes, the water of condensation and the air in the condensed vapour being enabled to escape. A float-valve or trap and a permanent by-pass for the air are placed in the outlet or condensed water-main of each radiator, heater, or coil, the by-pass serving as a spindle for a double-beat valve, and an opening in the tube between the valves leads into the passage that communicates with the outlet. Another kind of trap has one valve that is worked with a float having a pivoted arm through which is passed the tube upon which the valve is mounted.

12,648.—A METHOD OF FIXING FLOOR BOARDS: *R. Endres.*—For fastening the boards on to the joists and beams are devised nails that are pointed at both ends and can be driven slantwise to be out of sight, the adjoining board is driven up against the upper end of the nail which is turned down horizontally, a tool having a rounded recess for taking the nail-points is used for driving in the nails.

11,654.—A CIRCULAR-SAW GUARD: *D. A. Murdoch and F. Murdoch.*—The inventors contrive that the pressure of the wood as it is fed forward shall automatically raise the guard. A frame upon either side of the saw, and of which the openings are filled with "expanded metal," constitutes a shield whereof the rear end is joined by radius bars to an axis that rotates in bearings upon the horizontal arm of a standard. On the top of the shield is a wheel running upon the edge of a bracket secured to the arm. When the pressure of the wood lifts the shield, a counter-weight balances the weight of the shield and the radius-bars, and the latter (together with the wheel on the bracket) regulate the horizontal rising of the frame.

12,672-3.—MANUFACTURE OF GLASS: *A. Voelker.*—Worms from hoppers feed the raw materials to the electrical furnace, and heat from an arc between carbon electrodes fuses the materials; the molten glass is further heated in a clearing-tank for clearing away air-bubbles with an electrical current that is passed between electrodes through the tank, and the glass can be maintained at the desired heat by a current passed through the receiving-tank. (12,673.) Graphite, powdered charcoal, or other conducting substances are mixed with the ground raw materials, which are then melted with an electrical current that is passed through the admixture.

12,714-5.—TOPS FOR VENTILATING-SHAFTS: *J. Linkleter.*—The inventor provides a long mouthpiece, shaped as a hood, and as wide as the down-take pipe, which has a wind-vane and ball-bearings that work in a ring. He also devises a semi-circular, or hemi-cylindrical, screen, which carries a directing-vane as an addition to the customary revolving fly, or slit-drum.

12,716.—A CONTRIVANCE FOR ELECTRICAL SWITCHES: *W. B. Dale.*—The contact is so arranged as to be always parallel to the plane of the contacts, and to thereby give a wide double break. In the case of a double-pole switch a cross-piece carries the contact-bars, and to its arms are pivoted two levers of which the other ends are pivoted to a bracket. For giving a quick break a spring connects the bars, to one of which a handle is loosely connected.

MEETINGS.

FRIDAY, NOVEMBER 8.

Architectural Association Discussion Section.—Mr. W. E. Davis on "The Finishing of a Dwelling-house." 7.30 p.m.

The Technical College Architectural Craftsmen's Society.—Mr. Robert Stuart on "Soft Wood," and Mr. D. S. Pringle on "Hard Wood," 204, George-street, Glasgow. 8 p.m.

MONDAY, NOVEMBER 11.

Surveyors' Institution.—Opening Address by the President, Sir John F. L. Rolleston, M.P. 8 p.m.

Clerks of Works' Association, Carpenters' Hall.—Paper by Mr. J. T. Micklethwaite. 7.30.

Bristol Society of Architects.—Mr. John Fisher on "The Work of Alfred Stevens," with limelight illustrations. 8 p.m.

TUESDAY, NOVEMBER 12.

Institution of Civil Engineers.—Messrs. W. Kaye Parry, M.A., and W. E. Adeney, D.Sc., on "The Discharge of Sewage into a Tidal Estuary." 8 p.m.

WEDNESDAY, NOVEMBER 13.

Institute of Sanitary Engineers.—General Purposes and Finance Committee at 4 p.m. Council meeting at 7 p.m.

Northern Architectural Association.—The President (Mr. Frank Caws) will deliver his Inaugural Address. 7.30 p.m.

THURSDAY, NOVEMBER 14.

Manchester Society of Architects.—Mr. Paul Waterhouse, M.A., on "Architecture Among the Modern Arts." 7 p.m.

Sheffield Society of Architects and Surveyors.—Mr. C. F. Brindley on "Organ Cases and Organ Chambers."

Institution of Electrical Engineers (Dublin Local Section).—Mr. P. S. Sheardown on "An Account of the German Tour of the I.E.E."

FRIDAY, NOVEMBER 15.

Architectural Association.—Mr. Max Clarke on "The Sanitation of a Country House." 7.30 p.m.

Institution of Mechanical Engineers.—8 p.m.

SATURDAY, NOVEMBER 16.

Dundee Institute of Architecture.—Visit to St. Andrews.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

October 10.—By FAVERMAN & Co. (at Leamington).

Leamington Spa, Warwick.—1, Regent-grove, f.	£625

October 15.—By J. C. PLATT (at Hammersmith).

Hammersmith.—143, The Grove, u.t. 75 yrs., g.r. 11*l.*, e.r. 60*l.*	620
34 and 36, Studland-st., f.	820
Shepherd's Bush.—1, St. Stephen's-av., u.t. 52 yrs., g.r. 7*l.*, e.r. 45*l.*	383

October 22.—By SEDGWICK, SON, & WEALL (at Watford).

Watford, Herts.—99, Queen's-rd., f., r. 28*l.*	480
71 and 73, Sutton-rd., f.	375
New Bushey, Herts.—53 and 55, Villiers-rd., f.	390
Villiers-rd., &c., two plots of land, f.	295
2, Lower Paddock-rd., f.	265
96 and 98, Villiers-rd., f.	266
Croxley Green, Herts.—New-rd., Rosebank Cottages (2), f.	335

By W. R. NICHOLAS & Co. (at Shrewsbury).

Pontesbury, Salop.—The Longden Hall Farm, 311 a. 0 r. 39 p., f.	7,850

October 22 and 23.—By LUDLOW & BRISCOE (at Wolverhampton).

Upper and Lower Penn, &c., Staffs.—The Lloyd Estate (second portion), 1,225 acres (in numerous lots), f.	63,558

October 23.—By WORSFOLD & HAYWARD (at Sandwich).

Eastry, Kent.—Hill House, f.	800

October 24.—By BAXTER, PAYNE & LEPPER (at Bromley)

Bromley, Kent.—65, Masons Hill, f., e.r. 50*l.*	770
87 and 89, Widmore-rd., u.t. 60 yrs., g.r. 12*l.*, r. 78*l.*	645
54, 56 and 58, Pope-rd., f.	770
High-st., i.g.r. 48*l.* 10s., u.t. 25 yrs, g.r. 12*l.* 10s.	450
Beckenham, Kent.—162 to 168 (even) and 172 Mackenzie-rd., u.t. 94 yrs., g.r. 30*l.*	1,205

By GRIMLEY & SON (at Birmingham).

Rock, Worcester.—The Alton Estate, 783 a. 0 r. 26 p., f.	3,200

October 25.—By GREEN & SON.

Old Kent-rd.—Earl-rd., the Patent Leather and Cloth Factory, area 9,450 ft., u.t. 21½ yrs., g.r. 19*l.*, r. 75*l.*	630
43 to 63 (odd), Earl-rd., u.t. 21½ yrs., g.r. 11*l.*	1,475
31, Charlotte-st., u.t. 21½ yrs., g.r. 5*l.*, r. 25*l.*	190
33, 35, 37, and 39, Charlotte-st., u.t. 21½ yrs., g.r. 5*l.*	580
48 to 72 (even), Rolls-rd., u.t. 30 yrs., g.r. 17*l.* 10s.	2,900
Brentford, Middx.—Eaton-buildings, f g.r. 30*l.*, reversion in 72¾ yrs.	550

By JONES, LANG, & Co.

Aldgate.—3, Duke-st., area 450 ft., l., r. 65*l.*	1,290
City of London.—16, Pudding-lane, area 600 ft., f., r. 112*l.*	2,410

By MOSS & JAMESON.

Balham.—3, 19, and 49, Rossiter-rd., u.t. 76 yrs, g.r. 24*l.* 8s., r. 108*l.* 4s.	650
56 to 102 (even), Rossiter-rd., u.t. 72 yrs., g.r. 42*l.*, r. 144*l.*	930
46 and 48, Sistova-rd., u.t. 76 yrs., g.r. 14*l.* 14s., r 72*l.*	560
106, Bedford Hill, u.t. 75 yrs., g.r. 14*l.* 14s., e.r. 55*l.*	270
46, Kyde Vale-rd., u.t. 73 yrs., g.r. 9*l.* 10s., r. 38*l.*	180
44, Byrne-rd., u.t. 73 yrs., g.r. 7*l.* 10s., e.r. 45*l.*	205
Tooting.—63 to 69 (odd), Beechcroft-rd., u.t. 76 yrs., g.r. 17*l.*	625
Somers Town.—23, 24, 25, 27, 29, and 30, Sidney-st., u.t. 19 yrs., g.r. 75*l.* 12s.	355

By RIDER & SONS.

Kilburn.—19, Salusbury-rd., u.t. 51 yrs., g.r. 9*l.*, r. 50*l.* 12s.	490
Hammersmith.—39, Caithness-rd., u.t. 65 yrs., g.r. 8*l.* 8s., r. 44*l.*	420
Willesden.—30 and 32, Villiers-rd., u.t. 78 yrs., g.r. 10*l.*	440

By DOUGLAS STRATFORD.

Wandsworth.—9, 13, and 15, Mallinson-rd., u.t. 66 yrs., g.r. 15*l.*, r. 96*l.*	885
Fulham.—22, Dimsdale-rd., f, r. 31*l.* 4s.	360

By W. S. WRIGHT.

Ealing.—272, 274, and 274A, Uxbridge-rd., and a plot of land in rear, f., e.r. 16*l.*	3,000

By A. J. SHEFFIELD.

Stepney.—108, Eastfield-st.; 11 and 12, Union-terrace Limehouse.—5 and 6, Three Colt-court, u.t. 95 yrs., g.r. 18*l.* 15s.	200
Poplar.—22, Prestige-st., f.	290
23, 24, and 25, Prestige-st., u.t. 56 yrs., gr. 10*l.* 10s.	540
Millwall.—56 and 58, Manilla-st., f.	440
Barking, Essex.—13, 15, 17 and 19, Fisher-st., f.	440
Hackney.—Alexandra-ter., i.g.r. 31*l.* 10s., u.t. 90 yrs., g.r. 21*l.*	190
Bermondsey.—7 and 8, Mellor-st., f.	800
Mile End.—17 and 19, Wolsey-st., u.t. 17 yrs., g.r. 19*l.*	205
Clapton.—85, Overbury-st., u.t. 99 yrs., g.r. 5*l.*	200

By A. SPAIN & SON (at Gravesend).

Gravesend, Kent.—60, Milton-rd., f., r. 16*l.*	290
50, Darnley-rd., f., e.r. 26*l.*	395
Milton-next-Gravesend, Kent.—30, Windmill-st., f., e.r. 30*l.*	385

By DAVID BURNETT & Co. (at Diss).

Dickleburgh, Norfolk.—Carlton Grove and 7 a. 3 r. 22 p., f.	805

October 28.—By ELLIOTT, SON, & BOYTON.

Chelsea.—34, Christchurch-st., u.t. 48½ yrs., g.r. 4*l.*, r. 34*l.*	350

October 28.—By FISHER, STANHOPE, & DRAKE.

Clapton.—210, Lower Clapton-rd., f., r. 42*l.*	700
Stoke Newington.—62, Bethune-rd., u.t. 79 yrs., g.r. 10*l.* 10s., e.r. 65*l.*	650

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12, Fountayne-rd., u.t. 78 yrs., g.r. 10*l.*, e.r. 70*l.* .. £775

By Fred. Varley.

Holloway.—71, Landseer-rd., u.t. 62 yrs., g.r. 4*l.* 4s., r. 27*l.* 270

66, 68, 72, 74, and 76, Kingsdown-rd., u.t. 62 yrs., g.r. 31*l.* 4s. 1,295

93 to 99 (odd), Kingsdown-rd., u.t. 62 yrs, g.r. 21*l.* 1,110

Elthorne-rd., The Cordwainers Arms b.-h., u.t. 65 yrs., g.r 25*l.*, r. 100*l.* 1,470

31, Ashbrook-rd., and range of stabling in rear, u.t. 65 yrs., g.r. 6*l.*, r. 112*l.* 8s. 960

62 to 68 (even) Elthorne-rd., u.t. 73 yrs., g.r. 23*l.* 15s., r. 133*l.* 1,255

55, Elthorne-rd., u.t. 61 yrs., g.r. 14*l.*, r. 45*l.* .. 315

51, Elthorne-rd., u.t. 65 yrs., g.r. 6*l.* 10s., r. 40*l.* 315

Finsbury Park.—1, Somerfield-rd., u.t. 65 yrs., g r. 6*l.* 6s., r. 40*l.* 465

By Stimson & Sons (at Willesden).

Willesden.—Kingthorpe-rd., &c., fifty-one plots of building land, f. (in lots) 2,673

Aldgate.—Nos. 29 and 30, area 1,200 ft., f., r. 337*l.* 10s. 8,500

October 29.—By Debenham, Tewson, & Co.

Brighton, Sussex.—16, 17, 18, and 18a, Old Steyne; 131, St. James's-st., and Sea View House, area 2,750 ft., f., r. 449*l.* 8,100

By John Bott & Sons.

Norwood.—44 and 46, Birkbeck-pl., f., e.r. 38*l.* .. 770

Herne Hill.—267, Norwood-rd., u.t. 69½ yrs., g.r. 6*l.* 6s., e.r. 55*l.* 520

By C. W. Davies & Son.

Highbury.—3, Witheriugton-rd., u.t. 83½ yrs , g.r. 8*l.* 8s., r. 50*l.* 550

26 to 36 (even), Horsell-rd., u.t. 83½ yrs., g.r. 54*l.* 5s., r. 292*l.* 2,735

21, Davenant-rd., u.t. 56½ yrs., g.r. 6*l.*, r. 38*l.* .. 345

92, Isledon-rd., u.t. 50 yrs., g.r. 8*l.*, r. 50*l.* 430

Tottenham.—29, Carlingford-rd., u.t. 89 yrs., g.r. 5*l.* 10s., r. 32*l.* 320

Islington.—1, Gordon-st., f., e.r. 34*l.* 475

By G. Haslett.

Fleet-st.—Bride-lane, the White Bear p.h., f.g.r. 100*l.*, reversion in 66 yrs. 2,950

By Peacey & Fuller.

Camden Town.—105, Park-st., u.t. 22 yrs., g.r. 20*l.*, e.r. 65*l.*, with goodwill, fixtures, &c. .. 330

Bexhill-on-Sea, Sussex.—Sackville-rd., Brassey House, u.t. 94 yrs., g.r. 10*l.*, r. 80*l.* 1,100

By Alfred Richards.

Tottenham.—220, St. Ann's-rd., area 5 acres, part f. and part u.t. 48 yrs., g.r. 26*l.*, r. 70*l.* 1,100

Hammersmith.—18, 20 and 22, Benbow-rd., u.t. 62 yrs., g r. 22*l.* 10s., r. 94*l.* 925

Bow.—71, Tredegar-rd., u.t. 64 yrs., g.r. 5*l.* 10s., r. 34*l.* 395

By Rutley, Son, & Vine.

Barnsbury.—23, 25, and 27, Blundell-st., u.t. 50 yrs., g.r. 18*l.* 870

Holloway.—10, Windsor-rd., u.t. 51 yrs., g.r. 5*l.*, r. 36*l.* 380

Kentish Town.—50, York Rise, u.t. 58 yrs., g.r. 8*l.*, r. 32*l.* 320

By Tyser, Greenwood, & Crier.

Chiswick.—338, High-rd., f. 5,250

375, High-rd., f., r. 85*l.* 1,815

Brentford, Middx.—1 to 6, Burdett-row, f. 495

By Fred. Warman.

Islington.—237, Essex-rd., u.t. 44 yrs., g.r. 6*l.* 10s., r. 50*l.* 575

Herne Hill.—29, Lowden-rd., u.t. 65 yrs., g.r. 5*l.*, e.r. 30*l.* 235

By J. Straker & Sons (at Abergavenny).

Grosmont, Mon.—The Lawns and Lower Grounds Estate, 313 a. 3 r. 3 p., f. 10,000

October 30.—By Beal & Myrtle.

Stroud Green.—29, Albert-rd., u.t. 72 yrs., g.r. 9*l.* 620

By Dolman & Pearce.

Holloway.—Junction-rd., f.g.r. 30*l.*, reversion in 53 yrs. 900

By Guy Ewing & Co.

Edenbridge, Kent.—High-st., Orchard House, f., e.r. 75*l.* 1,500

High-st., 1 to 4, Katharine Villas and 1 to 9, Katharine Cottages, f. 2,585

By Harold Griffin.

Old Kent-rd.—26 and 28, St. Thomas-rd.; also l.g.r. 4*l.*, u.t. 56 yrs., g.r. 12*l.* 500

Peckham.—34 to 54 (even), Tilson-rd., u.t. 60 yrs., g.r. 32*l.* 1,770

Walworth.—5 to 11 (odd), Northampton-pl., u.t. 60 yrs., g.r. 20*l.* 655

161, 163, 165, Boyson-rd., u.t. 50 yrs., g.r. 18*l.* 870

Vauxhall.—148 to 156 (even), Tyers-st., u.t. 61 yrs., g.r. 25*l.* 1,265

Wandsworth.—1 to 23 (odd), Bridgefield-grove, u.t. 51 yrs., g.r. 36*l.* 1,505

2 to 20 (even), Coligny-st., u.t. 80 yrs., g.r. 35*l.* 1,325

1 to 15 (odd), Coligny-st., u.t. 84 yrs., g.r. 32*l.* 1,045

By Marten & Carnaby.

Dulwich.—14, Croxted-rd., u.t. 75 yrs., g.r., &c., 8*l.* 18s. 10d., e.r. 45*l.* 420

By R. Tidey & Son.

Stoke Newington.—69 and 71, Mildmay-rd., u.t. 48 yrs , g.r. 12*l.* 12s., r. 83*l.* 83

De Beauvoir Town.—169, Church rd., u.t. 38 yrs., g.r. 3*l.*, r. 40*l.* 400

By Douglas, Young, & Co.

Ilford, Essex.—Loxford-lane, a block of freehold building land, 14½ a. 5,510

Croydon.—Dartnell-rd., a plot of building land, f. 280

Stockwell.—118, Landor-road, u.t. 73 yrs., g.r. 8*l.*, r. 60*l.* 600

Notting Hill.—148, Kensington Park-rd., u.t. 50 yrs., g.r. 8*l.*, r. 55*l.* 400

23, Blenheim-cres., u.t. 50 yrs., g.r. 8*l.*, r. 45*l.* 350

By R. Cheke & Co. (at Stratford).

Leytonstone.—15 and 17, Clarendon-rd., f., r. 60*l.* 900

Manor Park.—13, 21, 23, and 25, Morris-av., f. .. 1,095

22, Meanley-rd., u.t. 71 yrs., g.r. 5*l.* 200

60, 62, and 64, Lawrence-av., f. 700

October 31.—By Browett & Taylor.

Hampstead.—34, 36, and 38, Stanley Gardens, u.t. 61½ yrs., g.r. 27*l.* 1,680

Clapton.—38 to 50 (even), Chatsworth-rd, u.t. 74 yrs., g.r. 70*l.*, r. 342*l.* 10s. £4,100

Tottenham.—139 to 145 (odd), Welbourne-rd., u.t. 76 yrs., g.r. 18*l.* 770

Rotherhithe.—2 to 8 (even), Edale-rd., u.t. 74 yrs., g.r. 18*l.* 720

Peckham.—24, 26, and 28, Machell-rd., u.t. 74 yrs., g.r. 13*l.* 10s. 705

By Ford & Co.

Lambeth.—Chattel interest (if any) of 56, 58, 82, 84, 86, and 88, Lambeth-rd., u.t. 4½ yrs., g.r. 43*l.* 14s. 255

By A. & G. Guiver.

Enfield Highway.—Main-rd., two freehold houses and shops, r. 18*l.* 1,150

Main-rd., four freehold cottages 1,060

Oatlands-rd., two freehold villas 600

Ponders End.—11, Napier-rd., u t. 57 yrs., g.r. 3*l.* 10s. 135

By Charles Hall.

Brixton.—194, Stockwell-rd., u.t. 70 yrs., g.r. 16*l.* 16s., r. 65*l.* 600

By Messrs. Kemsley.

Walthamstow.—38, Orford-rd. (off-licensed premises), f., with goodwill 2,010

63 and 65, Orford-rd., f., r. 92*l.* 900

2, East-av., f., r. 25*l.* 325

By W. Martin & Co.

Dulwich.—18 and 20, Tarbert-rd., u.t. 78½ yrs., g.r. 12*l.* 12s., r. 62*l.* 645

By C. C. & T. Moore.

Bethnal Green.—21, Patriot-sq , area 3,700 ft., f.. 860

Leyton.—Boundary-rd., six plots of building land, f. 400

New Cross.—Cold Blow-lane, Pink's Spice Mills, area 32,700 ft., u.t. 54 and 14 yrs., g.r. 105*l.*, r. 200*l.* 2,735

Canning Town.—1 and 3, Hill-st.; also two plots of building land, f. 345

9, Custom-st., f. 430

Penge.—31, Hawthorn-grove (Mission Hall), f., r. 26*l.* 620

Kentish Town.—52, Victoria-rd , r. 50*l.*; also l.g.r. 4*l.*, u.t. 33½ yrs., g.r. nil 175

By Robins, Gore, & Mercer.

Marylebone.—14, Carburton-st., u.t. 20 yrs., g.r. 35*l.* 360

By Stimson & Sons.

Peckham.—7, 9, and 11, Chadwick-rd., f., r. 94*l.* 10s. 1,165

2 to 16 (even), Chadwick-rd., u.t. 51 yrs., g.r. 28*l.*, r. 236*l.* 12s. 1,785

Tottenham Court-rd.—16, Whitfield-st., f., r. 56*l.* 1,450

Marylebone.—2, Westmoreland-st., u.t. 13½ yrs., g.r. 20*l.*, r. 70*l.* 140

Highgate.—Hornsey-lane, Harberton, u.t. 15 y.s., g.r. 18*l.*, r. 120*l.* 800

Hammersmith.—23 to 39 (odd), Chancellor-rd., u.t. 62 and 61 yrs., g.r. 45*l.*, r. 282*l.* 2,240

45, Chancellor-rd., u.t. 33 yrs., g.r. 5*l.*, r. 32*l.* 230

Belvedere, Kent.—1, Coleman-rd., u.t. 94 yrs., g.r. 3*l.* 305

33 to 39 (odd), 40 to 56 (even), and 60, Coleman-rd., u.t. 94 yrs., g.r. 44*l.* 10s. 2,880

Old Kent-rd.—29 and 31, Arthur-st., u.t. 17¾ yrs., g.r. 4*l.* 10s. 250

Deptford.—76, St. John's-rd., u.t. 22 yrs., g.r. 2*l.* 10s. 150

67 and 69, Napier-st., u.t. 43¾ yrs., g.r. 4*l.* 350

203, Evelyn-st., u.t. 24 yrs., g.r. 2*l.* 5s. 110

By Henry Hendricks (at Birmingham).

Harborne, Staffs.—116 and 118, Vivian-rd., u.t. 69 yrs., g.r. 8*l.* 16s. 3d., r. 72*l.* 875

Aston, Staffs.—18, Burbury-st., f. 400

1 and 2, Temple-pl., f. 195

Birmingham, Warwick.—53 and 54, Park-st. and six houses in rear, area 432 yards, f. 540

Liverpool-st., a plot of building land, area 2,310 yards, f. 1,000

Balsall Heath, Worcr.—18 to 21, Upper Cox-st., f. 1,130

Nov. 1.—By Bowditch & Grant.

Croydon.—Park Hill-rd., "Netherfield," u.t. 62 yrs., g.r. 20*l.* 1,070

Selsdon-rd., "Ivy Cottage" and ¾ a., f. 1,035

41, Addiscombe-rd., u.t. 63½ yrs., g.r. 12*l.* 10s. 650

Walpole-rd., Kazarma, u.t. 61½ yrs., g.r. 12*l.* .. 380

Waddon.—Stafford-rd., Homefield, u.t. 75 yrs., g.r. 12*l.* 850

By Drysdale, Nurse, & Co.

Stoke Newington.—66, Manor-rd., u.t. 73 yrs., g.r. 9*l.* 535

17, Reighton-rd., u.t. 75 yrs., g.r. 6*l.* 10s., e.r. 42*l.* 430

Stamford Hill.—14, West Bank, u.t. 82 yrs., g.r. 10*l.*, e.r. 65*l.* 715

43, West Bank, u.t. 82 yrs., g.r. 8*l.*, e.r. 55*l.* .. 550

By Reynolds & Eason.

Brixton.—28, 30, and 32, Bishop's-rd., u.t. 59½ yrs., g.r. 12*l.* 15s. 780

Stepney.—121, St. Dunstan's-rd., u.t. 61 yrs., g.r. 3*l.* 3s., e.r. 42*l.* 355

By Alfred Preece.

Tottenham.—13 and 19, King's-rd., u.t. 60 yrs., g.r. 4*l.* 300

Highgate.—41, Woodsome-rd., u.t. 60½ yrs., g.r. 7*l.*, r. 42*l.* 450

By T. G. Wharton.

Forest Hill.—Elsinore-rd., f.g.r.'s 63*l.*, reversion in 98½ yrs. 1,525

Battersea.—Parkside-st., f.g.r. 28*l.*, reversion in 61 yrs. 800

Elcho-st., f.g.r. 31*l.* 10s., reversion in 65 yrs. .. 745

Leyton.—Capworth-st., f g.r.'s 45*l.*, reversion in 64 yrs. 1,045

Belgravia.—56, Ebury-st , and 25 and 25A, Eccleston-st., u.t. 22 yrs., g.r. 12*l.*, r. 390*l.* 4,300

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 12 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 10 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts	1 13 0	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 6 6	,,	,, ,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 4 0	,,	,, ,,
Glazed Bricks			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.		
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	,, ,,
Best Portland Cement	32	0	per ton, delivered.
Best Ground Blue Lias Lime	25	6	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered
Stourbridge Fire-clay in sacks, 28s.	od.	per ton at rly. dpt

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. dep't.	
Bath ,,	1 7	,,	,,
Farleigh Down Bath	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,,	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	s. d. 2 8	per ft. super at rly. depôt	
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt	
,, ,, ,, 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
,, ,, ,, 3-in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.		
20 × 10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.	
,, best seconds	,, 10 15 0	,,	,,
16 × 8 best	,, 6 2 6	,,	,,
20 × 10 best blue Portmadoc	— 10 18 0	,,	,,
16 × 8 best blue Portmadoc	6 0 0	,,	,,
20 × 10 best Eureka unfading green	11 2 6	,,	,,
16 × 8 ,, ,,	6 15 0	,,	,,
20 × 10 Permanent green	10 0 0	,,	,,
16 × 8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt	
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.

[*See also page 425.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
Offices and House, Dartmouth	Channel Coaling Co., Ltd.	Not stated	Nov. 20
Workmen's Dwellings, Alexandra Park	Glasgow Corporation	100*l.*, 50*l.*, 25*l.*	Feb. 1

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Sewers, Oxhill-road	Handsworth (Staffs) U.D.C.	H. Richardson, Civil Engineer, Council House, Handsworth	Nov. 12
Additions to Schools, Southend	Sutton & Shopland Sch. Managers	N. Y. Hobbiss, Architect, 57, High-street, Southend	do.
House, Grange Moor	Huddersfield Co-op. Society	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Wall, &c., at Workhouse, Crumpsall	Manchester Guardians	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	Nov. 13
Alterations to Premises, Charlotte-street	Leith (N.B.) Town Council	Mr. Simpson, Architect, Council Chambers, Leith	do.
Additions to Workhouse, Limerick	.....	Carroll & Batchelor, Architects, 86, Merrion-sq. South, Dublin	do.
Stoneware Pipes	Chepping Wycombe Corporation	T. J. Rushbrooke, Borough Surveyor, Wycombe	do.
Retaining Wall, Spotland Bridge	Rochdale Corporation	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	do.
Additions to Waggon Works, Tyne Dock	North-Eastern Railway Company	W. Bell, Architect, Central Station, Newcastle	do.
Sewerage Works, Middleton	Ashbourne R.D.C.	I. Sheldon, Council Offices, Ashbourne	do.
Five Houses, Morrison-street, Castleford	Mr. E. Sidwell	R. M. M'Dowall, Architect, Carlton-street, Castleford	do.
*Six Houses, Lewes	Lewes Co-op. Society, Limited	T. W. Franks, Architect, Lewes	do.
*Goods Warehouse, Northampton	Midland Railway Company	Company's Architect, Cavendish House, Derby	Nov. 14
Alterations, Royal Oak Inn, New Bilton	Messrs. Phillips & Marriott, Ltd.	H. W. Chattaway, Architect, Trinity Churchyard, Coventry	do.
Sewerage Works, Glass Houghton	Pontefract R.D.C.	W. L. Le Maitre, Civil Engineer, Greek-street Chambers, Leeds	do.
Church Tower and Spire, Castleisland, co. Kerry	.....	D. J. Coakley, Architect, 1, Charlotte-quay, Cork	do.
Sewerage Works	Hoyland Nether U.D.C.	W. P. Young, Surveyor, Town Hall	do.
Surveyor's Materials	Cork Town Council	City Engineer, Municipal Buildings, Cork	do.
Paving Works, Fylde-road, &c.	Preston (Lancs) Corporation	Borough Surveyor, Town Hall, Preston	Nov. 15
Street Mains	St. Anne's-on-Sea (Lancs) U.D.C.	P. J. S. Tiddeman, Engineer, Electricity Works, St. Anne's	do.
Surveyor's Materials, Witton, near Birmingham	Messrs. Kynoch, Ltd.	Secretary, Kynoch's, Ltd., Lion Works, Witton, Birmingham	do.
School, Haugh Shaw	Halifax School Board	C. F. L. Horsfall & Son, Architects, Halifax	Nov. 16
Sewerage Works, Tollesbury	Maldon (Essex) R.D.C.	H. G. Keywood, Civil Engineer, Public Hall Chambers, Maldon	do.
Electricity Works	Chesham U.D.C.	J. G. How, Council Offices, Chesham	do.
Fire Escape Stairs, &c., Dutton	Runcorn Guardians	G. F. Ashton, 71, High-street, Runcorn	do.
*Wrought-iron Fencing and Supply of Gravel	London County Council	Parks Department, 11, Regent-street, S.W.	Nov. 18
Paving Works, High-street, &c	Wednesbury Corporation	E. M. Scott, Borough Engineer, Town Hall	do.
Workhouse Bakery, Shaw Heath	Stockport Guardians	J. Hunt & Son, Architects, 4, Warren-street, Stockport	do.
60 Houses, Pontlottyn, Wales	.....	T. Roderick, Architect, Aberdare	do.
Five Shops and Houses, near Barrow-in-Furness	.....	Secretary, Isle of Walney Estates Company, Ltd., Walney	do.
Reservoir, Pinmacher Burn	Girvan (N.B.) Town Council	J. & H. V. Eagleaham, Civil Engineers, Wellington Chambers, Ayr	do.
Schools, Hayle, Cornwall	.....	S. Hill, Architect, Redruth	do.
Drainage and Road Works, Pontlottyn, Wales	.....	T. Roderick, Architect, Aberdare	do.
Road Works, East Park-road	Blackburn Corporation	W. Stubbs, Engineer, Municipal Offices, Blackburn	do.
Street Works, Kelly-street, &c.	do.	do.	do.
Alterations to Buildings, Witton	do.	do.	do.
Engine and Boiler House, &c. (Contract No. 14)	Bournemouth Town Council	F. W. Lacey, Civil Engineer, Municipal Offices, Bournemouth	do.
Inn, Charlestown, near Hebden Bridge	.....	W. H. D. Horsfall, Architect, Halifax	do.
Electricity Station, Addiscombe-grove	Croydon Town Council	Borough Engineer, Factory-lane, Croydon	do.
Works at Garn Schools	Blaenavon (Mon.) School Board	Lansdowne & Gibbs, Architects, Newport, Mon	Nov. 19
*Jobbing Works (three years)	Corporation of London	Engineer's Office, Guildhall, E.C.	do.
*Pipe Sewer	do.	do.	do.
Road Improvement Works, Beddington, Coulsdon, &c.	Croydon R.D.C.	R. M. Chart, Surveyor, Town Hall, Croydon	Nov. 20
Reservoir, Kilburn, York	Easingwold R.D.C.	Fairbank & Sons, Civil Engineers, 13, Lendal, York	Nov. 21
Additions to Wern Schools, Ystalyfera	Llanguicke School Board	W. W. Williams, Architect, 65, Wind-street, Swansea	Nov. 22
*Brick Gasholder Tank	New Swindon Gas Co.	The Secretary, Gas Offices, Swindon	Nov. 23
Hospital, Fall Birch-lane	Horwich Hospital Committee	Cressey & Keighley, Architects, Morecambe	Nov. 25
*New County Court, Middlesbrough	Commissioners of H.M. Works, &c.	H.M. Office of Works, Storey's Gate, S.W.	do.
*Tenement Houses, Canning Town	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	Nov. 26
*New Coastguard Buildings, Northumberland	Admiralty	District Clerk of Works, 21, Bootham-terrace, York	Nov. 29
*Engineering Work to Baths, Laundry, &c., Wells-st.	Camberwell Borough Council	Borough Engineer, Town Hall, Camberwell	Dec. 2
*Removal of House Refuse	St. Marylebone Borough Council	Town Hall, St. Marylebone, W.	Dec. 3
*Erection of New Infirmary, &c.	Warwick Union	F. P. Trepess, Architect, 8, Jury-street, Warwick	Dec. 5
*New Dock	Hull Joint Dock Committee	Sir John Wolfe Barry, 21, Delahay-street, Westminster	Dec. 6
Viaduct over River Barrow, South of Ireland	Fishguard & Rosslare Railways Co.	Sir B. Baker, 2, Queen Square-place, Westminster, S.W.	Dec. 16
*Museum Building, Middlesbrough	A. J. Dorman, Esq.	J. M. Bottomley, Architect, Middlesbrough and Leeds	No date
*Additions to Littlemore Asylum, near Oxford	The Committee of Visitors	.....	do.
Five Pairs Houses, Bolsover	.....	W. H. Wagstaff, Architect, Chesterfield	do.
Billiard Room, The Woodlands, Burley, Leeds	Mr. W. Plews	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Additions to Warehouses, Millicent-street, Cardiff	Messrs. J. Isaac & Sons	E. G. C. Down, Architect, 81, High-street, Cardiff	do.
Cottages, Kingston, Shoreham	Steyning Guardians	Clayton & Black, Architects, 152, North-street, Brighton	do.
Twelve Houses, Avenue Estate, Southend	.....	F. A. Knight, Surveyor, 2, Wetherby-terrace, Earl's Court, S.W.	do.
Road, Howick	.....	C. B. Winder, 15, Albert-road, Southport	do.
Roads at Cemetery	Deal Burial Board	J. R. Hammond, 23, Queen-street, Deal	do.
House, Wood, South Tawton, Devon	Mr. W. Lethbridge	J. Jerman, Architect, 5, Bedford-circus, Exeter	do.
Alterations to Railway Tavern, Washington, Durham	.....	G. Stephenson, Architect, 20, Collingwood-street, Newcastle	do.
Chimney (100 ft. high), Batley	.....	A. Jackson, Honley Park Colliery, Batley	do.
Additions to Schools	Conisborough (Yorks) School Bd.	G. White, Architect, Mexborough	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Building and Drainage Inspector	Twickenham U.D.C.	2*l.* 10s. per week	Nov. 16
*Road Surveyor	Hackney Borough Council	156*l.*	Nov. 19
*Correspondence and General Clerk	do.	120*l.*	do.
*Junior Draughtsman and Clerk	do.	80*l.*	do.
*Assistant Lecturer in Civil Engineering	Hartley College, Southampton	120*l.*	Nov. 20
*Assistant Examiner in H.M. Office of Works, &c.	.....	Not stated	Nov. 23

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxiv. Public Appointments, pp. xxi. & xxiv.*

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PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.
¾ in.	1 0 0	" " "
Fir timber: Best middling Dantzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 18 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (32 ft.)	3 0 0	3 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
" " 3 in. by 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " " 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 10 0	13 10 0
" " " 3 in. by 9 in.	12 0 0	12 10 0
" " battens	9 10 0	10 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
¼ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders " "	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Fitch Plates	8 10 0	9 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
" " galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		
LEAD, &c.	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe	17 0 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin "	0 1 2	- - -
Copper nails "	0 1 2	- - -
BRASS—		
Strong Sheet "	0 0 11	- - -
Thin "	0 1 1	- - -
TIN—English Ingots "	0 1 3½	- - -
SOLDER—Plumbers' "	0 0 6½	- - -
Tinmen's "	0 0 8	- - -
Blowpipe "	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d. per ft. delivered.
" " fourths	2½d. " "
21 oz. thirds	3½d. " "
" " fourths	3½d. " "
26 oz. thirds	5d. " "
" " fourths	4½d. " "
32 oz. thirds	6d. " "
" " fourths	5½d. " "
Fluted sheet, 15 oz.	3½d. " "
" " 21 "	4½d. " "
½ Hartley's Rolled Plate	2½d. " "
⅝ " " "	3½d. " "
¾ " " "	3½d. " "

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 9
" " in barrels "	0 2 10
" " in drums "	0 3 0
Boiled " in pipes "	0 2 11
" " in barrels "	0 3 0
" " in drums "	0 3 2
Turpentine, in barrels "	0 2 3
" in drums "	0 2 5
Genuine Ground English White Lead per ton	22 0 0
Red Lead, Dry "	22 10 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 10 0

VARNISHES, &c.

	per gallon. £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 18 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABBOTSKERWELL (Devon).—For the erection of a house, for the School Board. Mr. S. Segar, architect, Union-street, Newton Abbot. Quantities by architect:—

Francis	£525	F. W. Fey	£446
F. A. Stacey	479	Burnell & Richards	391
Parker Bros.	470	Albert	375
J. Edwards	455	Yeoman Bros., Kingsteignton*	358

ASHTEAD (Surrey).—For the erection of house, and entrance lodge and gardener's cottage, for Mr. A. Meyers, Forest Lodge, Ashtead. Mr. Richard Lee, architect, Great Bookham:—

Cropley Brothers, Ltd., Epsom* £5,180

BELFAST.—For the erection of sexton's house, &c., for the Rev. J. Gailey. Mr. R. A. Boyd, C.E., Garfield-street, Belfast:—

Taggart Bros., Ballysillan* £215

BRYNMAWR (Wales).—For the erection of school buildings, for the School Board. Mr. F. Baldwin, architect, 13, Frogmore-street, Abergavenny:—

D. W. Davies	£6,517 0	John Jenkins	£5,990 0
D. Thomas & Son	6,420 0	F. G. Robbins	5,932 10
T. S. Foster	6,265 0	John Newcombe	5,782 10
J. G. Thomas & Son	6,180 0	John Morgan, Blaenavon*	5,576 0
W. & L. Price	6,062 13		

CANNOCK (Staffs).—For the execution of water-supply works, for the Rural District Council. Mr. R. E. W. Berrington, engineer, Bank Buildings, Wolverhampton:—

H. Holloway	£6,256 16 4	J. Owens	£4,729 0 0
J. Mackay	4,973 17 0	C. E. Carden	4,662 18 1
Braithwaite & Co.	4,900 0 0	W. H. Reading, Wolverhampton*	4,575 0 0
Embrey & Sons	4,781 5 6		

COTHERSTONE (Durham).—For the execution of sewerage works, &c., for the Startforth Rural District Council. Mr. J. E. Parker, C.E., Post Office Chambers, Newcastle-on-Tyne:—

S. Dart	£2,758 5 3	Robson & Bank	£2,240 1 3
N. & J. Lant	2,596 15 7	S. Walker	2,150 0 0
W. Carr	2,434 19 0	Isaac Hetherington, Cotherstone*	2,074 8 10
Kyle & Sons	2,380 0 0	R. Wilson (withdrawn)	1,988 0 0
G. H. Bell	2,305 9 1		
P. O. Hetherington	2,253 6 3		

[Engineer's estimate, £2,200.]

DELAMERE (Cheshire).—For foundations and basements of main building and nurse's home at the Consumption Sanatorium, for Mr. W. J. Crossley, J.P. Mr. W. Cecil Hardisty, architect, Manchester. Quantities by Mr. Charles Jackson, Manchester:—

Freeman & Co.	£6,145	Neill & Sons	£4,660
Normanton & Son	5,496	J. Byron Bury	4,645
Hamilton & Son	5,247	Brown & Son	4,348
W. Healey	5,010	Reckett & Co.	3,862
P. Hodkinson	4,898	Bullivant & Sons	3,791
Parker Bros.	4,853	Gerrard & Sons*	3,620
Wilson & Toft	4,730		

DEVIZES.—For the erection of an isolation hospital. Messrs. Bell, Withers, & Meredith, architects, 3, Salters' Hall-court, London. Quantities by Messrs. C. Stanger & Son, 21, Finsbury-pavement, London:—

William Webb	£10,816	R. B. Mullings	£9,627
Kingerlee & Sons	10,605	W. E. Chivers	9,476
Wort & Way	10,450	Henry Ash	9,379
Holloway Bros.	10,291		

DOVER.—For the execution of street improvement works for the Town Council. Mr. H. E. Stilgoe, C.E., Town Hall, Dover. Quantities by the Borough Engineer:—

Geo. Munro	£1,519 2 0	D. & G. Keeler, Dover*	£1,314 4 0
Geo. Grigg	1,470 18 4		
Austen & Lewis	1,455 6 0		

ENFIELD.—For the execution of road works, Seventh-avenue and Fotheringham-road, for the Urban District Council. Mr. Collins, Surveyor, Court House, Enfield:—

	Seventh-avenue.	Fotheringham-road.
Griffiths & Co.	£760 0 0	£2,020 0 0
Chas. Bloomfield	728 5 0	2,896 7 6
E. S. Betts	717 0 0	2,600 0 0
T. Adams, Green Lanes, Wood Green*	699 0 0	2,549 0 0

FINEDON.—For asphalting footpaths, &c. (about 4,000 yds. super), for the Finedon Urban District Council. Mr. G. F. Bearn, surveyor, Wellingborough:—

F. Barlow 2s. and 2s. 3d. per sq. yd.
O. P. Drever 1s. 5½d. and 2s. 2½d. per sq. yd.
Scudamore & Co., Northampton* 1s. 11d. and 2s. 1½d. per sq. yd.

FULBOURN (near Cambridge).—For additions to the Cambridgeshire, &c., Asylum, for the Visitors. Mr. A. P. MacAlister, architect, 9, Gray's Inn-square, London, and Cambridge. Quantities by Mr. E. Dermot Nixon, 9, Gray's Inn-square, London:—

Chas. Roper	£19,252 0 0	F. C. Thurman	£15,439 0 0
G. Jackson	17,100 0 0	Bell & Sons	15,428 0 0
Alfred Guy	16,996 10 6	Kettering Co-operative Builders	15,036 0 0
Shillitoe & Son	16,691 0 0	E. Willmott & Sons, Cambridge†	14,956 0 0
Coulson & Lofts	16,640 0 0	F. H. Coleman	14,944 0 0
J. & J. Bloxham	16,569 0 0	J. Cracknell	14,838 0 0
Wm. Howard	16,400 0 0	Thackray & Co.	14,795 0 0
H. Martin	15,951 0 0		
Oak Building Co.	15,495 16 0		

[Architect's estimate, £14,500.]

HASTINGS.—For the construction of sewers, &c., Hollington-lane, for the Corporation. Mr. P. H. Palmer, Borough Engineer, Town Hall, Hastings:—

C. Marchant, 26, St. George's-road, Hastings £308 18 7

See also next page.

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ILFORD.—For the erection of seven houses, Henley-road, Ilford, for Messrs. Lowe & Co. Mr. A. W. Hudson, architect and surveyor, 87, Finsbury-pavement, E.C. :—

	Total for Seven Houses.	Rate per House.
Hawkey & Oldman	£2,373	£339
H. Wilson	2,170	310
B. Hart	2,135	305
T. Wilson	2,051	293
Wicks & Capon	1,785	255

LONDON.—For alterations and repairs at the Old Commodore, Whitechapel, E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. :—

S. Osborn & Sons* £766

LONDON.—For alterations at the Shaftesbury Arms, Hoxton, N. Messrs. C. Foulsham and Herbert Riches, architects, 3, Crooked-lane, King William-street, E.C., and Bromley-by-Bow, E. Quantities supplied :—

F. & T. Thorne	£2,588	Courtney & Fairbairn*	£2,375
Todd & Newman	2,543	Sheffield Bros. (withdrawn)	2,245
A. Rowe	2,483		

LONDON.—For alterations at the Barley Mow, Limehouse, E. Messrs. C. Foulsham and Herbert Riches, architects, 3, Crooked-lane, King William-street, and Bromley-by-Bow, E. :—

E. F. & T. J. Walker	£825	W. Harper	£680
C. North	789	S. Salt*	677

LONDON.—For the erection of a pair of semi-detached houses at Streatham. Messrs. Bell, Withers & Meredith, architects, 3, Salters' Hall-court, London :—

D. Waller	£2,457	W. H. Larman, Wimbledon*	£1,600
Spencer Santo, Ltd.	2,350		
Gathercole Bros.	2,000		

NEWHAVEN (Sussex).—For the execution of sewerage works, &c., for the Urban District Council. Mr. F. J. Rayner, Town Surveyor, Newhaven, Sussex. Quantities by Town Surveyor :—

J. G. Pickard	£1,740 16 0	Grounds & Newton	£1,380 0 0
Bentham & Co.	1,571 0 0	Langridge & Son	1,194 4 0
Peerless, Dennis, & Co.	1,534 0 0	H. A. Chambers, Seaford*	1,052 3 10
Cooke & Co.	1,465 0 0		

NORTHAMPTON.—For the erection of villa residence, Bective Estate, Kingsthorpe, for Mr. E. Branch. Messrs. Mosley & Scrivener, architects, Fish-street Chambers, Northampton. Quantities by the architects :—

W. Heap	£988 15	W. Beardsmore	£930 0
Sharman & Son	955 0	A. J. Chown, Northampton*	859 0
H. Martin	950 0		

NORTHAMPTON.—For the electric lighting of the public portion of Emporium Arcade, Northampton, for the Northampton Estates and Improvements Corporation, Ltd. Messrs. Mosley & Scrivener, architects, Fish-street Chambers, Northampton :—

F. Watkin	£171 0	National Wiring Co., London*	£117 18
Lea & Warren	163 10		
Mansell	130 0		

NORTH SUNDERLAND (Northumberland).—For the erection of a house, shop, &c., Sea Houses, for Mr. Jas. Young. Mr. G. Reavell, jun., architect, Alnwick :—

John Davidson, Sea Houses, North Sunderland* £809 2 0

SILEBY (Leicester).—For the execution of sewerage works, for the Barrow-upon-Soar Rural District Council. Mr. H. Herrod, surveyor, Barrow-upon-Soar. Quantities by surveyor :—

H. Morris	£133 8 0	J. Freer, Barrow-upon-Soar*	£114 10 0
J. T. Ball	120 10 0		
F. Sleash	116 10 4		

SLIGO.—For the erection of a chapel at asylum, for the Committee. Sir T. N. Deane & Son, architects, 15, Ely-place, Dublin. Quantities by Mr. D. W. Morris, Harcourt-street, Dublin :—

Denis McLynn	£1,100 0 0	Chas. Connolly	£1,012 15 5
John Clarence, Sligo*	£798 0 0		

WITHAM (Essex).—For the erection of a school Chipping Hill, for the School Board. Mr. W. P. Perkins' Surveyor, Urban District Council Offices, Witham Quantities by the architect :—

Richards & Sons	£1,345 5	H. Potter	£1,050 0
Cracknell & Baker	1,230 12	J. McKay	1,050 0
E. West	1,087 0	Smith & Son, Witham*	1,015 0
F. Johnson	1,059 0		

[Architect's estimate, £1,122.]

Cottage Homes, Shirley Lodge Farm, Woodside, Croydon.—In reference to the list of tenders for this work, printed in our last issue, "Bowyer & Co." should have been given as J. & C. Bowyer. We printed the list as it was sent to us.

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The Builder.

VOL. LXXXI.—No. 3567. NOVEMBER 16, 1901.

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Design for Triumphal Arch and Entrance Gates to Roadway ..... By Mr. T. G. Jackson, R.A.
Design for Triumphal Arch ..... By Dr. Rowand Anderson.
Rood Screen, S. Denys, Sleaford ..... Drawn by Mr. Herbert Kirk

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Illustrations to Mr. Gotch's Book on Renaissance ..... Pages 428 and 429
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Early Renaissance Architecture in England.

AMID the recurrent appearance of works in English Renaissance architecture it becomes rather difficult to distinguish between the object and scope of one work as compared with another; it seems at all events certain that English Renaissance architecture is at present regarded as an attractive subject both by architectural authors and architectural publishers. We have had Mr. Blomfield's work, "A History of Renaissance Architecture in England," followed by an abridged edition; Messrs. Belcher & Macartney's "Later Renaissance Architecture in England"; Mr. Gotch's "The Architecture of the Renaissance in England," a folio publication in which the illustrations formed the most important element; and now we have another work from the same author under the title, "Early Renaissance Architecture in England*;" a book in literary form, in which the illustrations, though numerous, are on a small scale and subordinate to the text, and the publication is of the nature of a historical handbook of the subject. In regard to Mr. Blomfield's book, the author of the present work defends himself from the charge of repeating the same subject by pointing out that, though Mr. Blomfield's work starts from the beginning of the sixteenth century, it does not dwell at length upon the earlier work, but is chiefly devoted to that of the seventeenth and eighteenth centuries. Mr. Gotch, in fact, in this book, classes Tudor and Elizabethan as "Renaissance," a classification to which, as a matter of definition, we decidedly object. If Tudor and Elizabethan work is called Renaissance, we are then called on to use the word Renaissance for completely different types of architecture, which have really very little in common. The fact is, we take it, that Renaissance is a popular word just now, and a better publishing name than Tudor or Elizabethan.

The first partial intrusions of Italian detail and (apparently) of Italian workmanship into English architecture are no doubt of great interest, and Mr. Gotch has collected and illustrated a good many examples of them; but these flowerings of Italian ornament in details do not affect the architectural style as a whole; typical Elizabethan architecture, in spite of them, has still much more affinity with late Gothic than with genuine Renaissance; nor do the channelled terminations to the pendants in the Hampton Court roof make that anything other than a late Gothic roof. The gradual introduction of points of symmetry in the plan, not called for except for the sake of symmetry, is in reality a much more important indication of the invasion of the Renaissance spirit than is shown in mere ornamental detail. Mr. Gotch places on two contiguous pages two plans which illustrate this in rather a curious manner. In the plan of Compton Wynyates a bay-window to the hall comes in close to one angle of the internal courtyard. In the plan of Sutton Place a bay-window to the hall, square on plan, comes in near one angle of the courtyard in the same way, but in this case it is duly balanced by a similar bay at the opposite angle, lighting however only a small and secondary apartment. The difference between the two buildings, according to Mr. Gotch's dates, is only four or five years (1520 to 1523-5); this is however rather a coincidence than an indication of a rapid chronological progress towards symmetry. Some of the details at Sutton are bad Italian in character, but the mouldings, as well as the general effect, are still late Gothic.

The development of plan in the Classic direction seems indeed to have been rather capricious; we have comparatively early plans which are very symmetrical, and later ones which are much more Mediæval, such as that of Hengrave Hall (1538), where the bay-window of the hall is nearly central with one side of the courtyard but not quite, and the plan generally is quite unsymmetrical. What distinguishes it is the use of a central courtyard smaller in proportion to the rest of the plan than is the case with the older quadrangle plans, and with the unwonted and rather modern device of a corridor of communication round three sides of the court and lighted from it; all the rooms except the hall (which forms the fourth side of the court) getting their light through the exterior walls.

This provision of a communication corridor with a good light from a central area was however an unusual refinement in regard to interior access to the rooms. The study of some of the plans in this volume is very interesting. The old quadrangle plan seems to have been the precursor of two forms of more compact plan in which there was still a reminiscence of the centre quadrangle. There is the plan with a central court for light, around which the rooms were grouped, and the plan with a central hall, top-lighted, around which also the rooms were grouped, but with, of course, no light except through the outer walls. Wollaton Hall (1580-88) is an example of the latter plan; and here nearly all the rooms open out of each other. Barlborough Hall, of about the same date, is built round a small court (fig. 1), now fitted with a modern staircase; this court does not seem to have been used for light, as far as the present plan shows; as it stands it is an intercommunication hall or lobby; but whether this was its original use, or whether the doors opening into it are modern, the author does not tell us. As will be seen, there was through communication all round the house, from room to room, in the naïve fashion of the day, without any use of the central space. The plan is a curious mixture of complete, almost classical, symmetry externally, with absolute lack of it internally. With all its exterior symmetry, however, the architecture is of late Gothic type, as may be surmised from the semi-octagon plan of the bays; these go right up, rising above the parapet and forming a species of towers; a treatment which, as Mr. Gotch truly remarks, "lends much distinction to an otherwise simple exterior." What was the reason for the extraordinary thickness of the interior walls as compared with the exterior ones there is nothing in either plan or view to explain. Chastleton, in Oxfordshire (fig. 2), dated 1603, shows the centre court pierced for windows, but nearly all the house consists of rooms opening out of each other, in a manner absolutely without plan or order, and as if the partition walls had been put up anyhow. In Bolsover Castle (fig. 3), dated 1613, we have again a plan of nearly complete symmetry outwardly, and with a great dignity in the arrangement of the forecourt; but here again all the symmetry is forgotten as soon as we get inside, and the plan becomes, one may say, more naïve than ever in the arrangement for intercommunication; but it should be a charming plan as regards internal effect, and those little surprises which do so much towards rendering a house interior interesting; and it

*"Early Renaissance Architecture in England: a historical and descriptive account of the Tudor, Elizabethan and Jacobean periods." By J. Alfred Gotch, F.S.A. London: B. T. Batsford. 1901.

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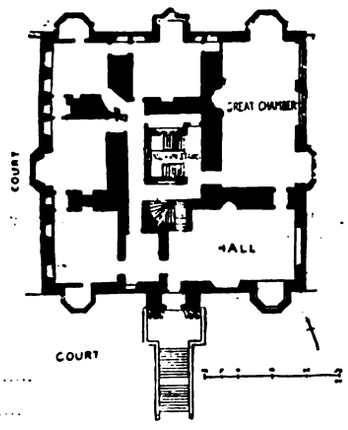

Fig. 1.—Barlborough Hall.

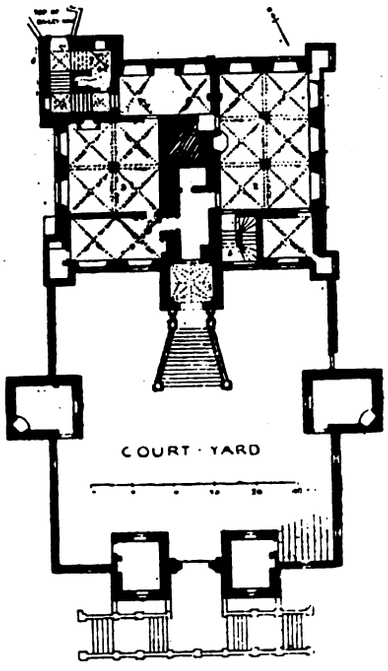

Fig. 3.—Bolsover Castle.

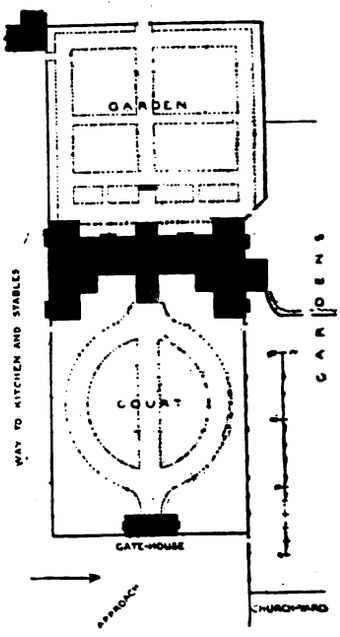

Fig 5.—Doddington Hall.

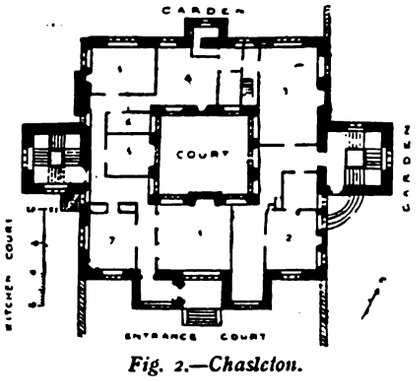

Fig. 2.—Chasleton.

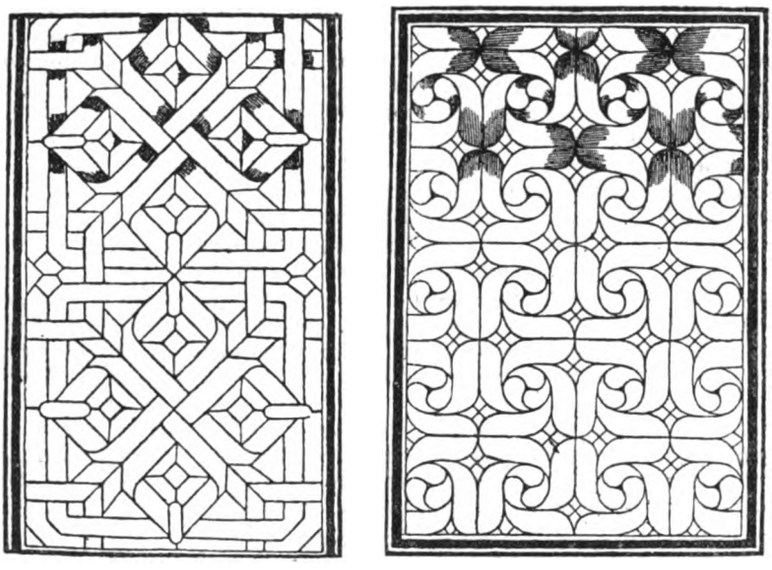

Fig. 6.—Glazing Patterns from Walter Geddc's Book (1615).

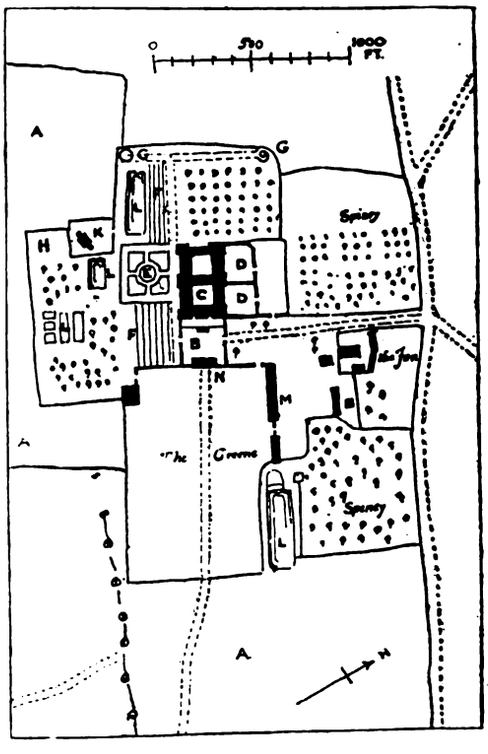

Fig. 4.—Holdenby House.

is worth notice that though there is there no interior court, either for light or for passage, we still seem to have the reminiscence of the interior court in the shape of that small square of (apparently) solid wall left in the centre, of which the author gives no explanation, but which certainly requires one. As it stands in the plan, it looks as if they could not do without something in the centre to build round.

Mr. Gotch gives the block-plan of Holdenby House (fig. 4) as an example of the laying out of the ground around an Elizabethan house, though in this case it may be said that there is not much laying out at all. While the drive traversed the park it was left to wind as the undulations of the ground suggested, but within a quarter of a mile of the lodge (N on plan) it became a straight road through "the green" up to the lodge, which stood on the axis of the house. "The house was built round two great courts, the first 128 ft. by 104 ft., the second 140 ft. by 110 ft. . . . The house covered nearly two acres, the basecourt (B) more than one acre; the green seventeen acres. In comparison with the house the village is a mere collection of outhouses, not so extensive as the range of stabling." This gives a good idea of the magnificent scale on which these Elizabethan houses of great people were planned, though it may be added that it has neither the magnificence nor the stateliness contemplated in Bacon's sketch of his imaginary house and surroundings in the Essay "Of Building." The much smaller plan of Doddington Hall and its forecourt and garden (fig. 5) is a good example of stately and symmetrical laying out of the ground round a house, especially in the combination of straight and circular drive from the gate-house.

In speaking of the general aspect of the Elizabethan houses, Mr. Gotch observes that their often picturesque and elaborate appearance is generally produced by very simple means. The picturesque effect of such houses as Haddon and Compton Wynyates is due to irregularity of plan; but in the Elizabethan house the design and plan (externally at all events) are regular and symmetrical, the picturesqueness springs from the manner of employing gables, windows, and chimneys. As the author says, there is "an exuberant vitality" about these houses, in spite of their occasional misuse of classic detail and insertion of unmeaning pilasters, which accords with the vitality of the literature of the period. There could be no better example of this than Burghley

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Fig. 7.—Glass Panel from Moreton Old Hall.

House, the first impression of which, with its crowds of chimneys and turrets, is ineffaceable from the memory. The bay window, with as much of it pierced as was possible, is a feature which was perhaps made too much of. Mr. Gotch devotes some remarks and illustrations to this subject, and gives the palm to the great twin bays of Kirby Hall; but this habit of carrying the mullioned window all round the bay, leaving it to a great extent cut in two in the middle, is rather of the nature of a *tour de force* in building, and one feels that the mullions of the lower window in many cases have a greater weight to carry than they should have, for appearance at all events; besides the result that the room is overlighted; a point specially criticised by Bacon, who complains that you find rooms where "you cannot tell where to be to come out of the sun." The front of Aston Hall, which Mr. Gotch shows on the same page as Kirby, is worse, for the windows are continued all along the wall between the bays, as well as all round them, making one continuous belt of window with only a very narrow pier at each angle of the building, so that the whole mass of the upper wall and parapet seem to stand in the air on stilts. That this should have remained in good preservation shows what careful and sound mason's work must have been done in setting up these windows, but it is really an effect much more suitable to a timber and plaster cottage than to a stone mansion on a large scale, and it is not one by any means worth imitating, as some persons seem disposed to imitate it. One advantage of the mullion as an architectural feature is that continuity of this kind may be obtained by using wall mullions only between the windows, ranging with them—a much more solid and satisfactory method than cutting away a whole mass of wall from corner to corner of the building, and leaving one to wonder how it stands.

The subject of the decorative treatment of the interior of Elizabethan and Jacobean houses receives abundant illustration and comment in Mr. Gotch's book, and this part of the subject is worth careful consideration on account of the many suggestions it affords to the modern designer and decorator. We quite concur with the author in his admiration for the effect of the portion of panelling shown in his fig. 138 (p. 152), an upright panel perfectly plain in the stiles and in the lower portion of the panel, but with a design of carved dolphins formed in a rectangular sinking at the top of the panel. This placing of the ornament at one point only is very characteristic, and may be applied in various different ways. The important subjects, in a decorative sense, of fireplaces and ornamental ceilings are also largely illustrated. The artistic importance of the "strap-work" plaster ceiling has perhaps been somewhat exaggerated; a good many of these ceilings are very much alike; when you have the *motif* of one you have that of all, with the exception of minor differences of detail; and in fact Mr. Gotch seems to think that the plasterers had stock designs from which they worked, though absolute repetitions of the same details are seldom found.

The "Long Gallery," to which the author draws special attention as one of the most characteristic features of Elizabethan and Jacobean houses, is one to which the modern architect of large mansions ought to give his attention. No finer feature, nor one which more repays the space bestowed on it, can be introduced into a house; and it may be planned, as in some Elizabethan houses it was, to serve not only as an apartment of State in itself, but as at the same time a means of communication and access to other rooms; and this is the use that it might be made to fulfil in a modern mansion. In a mansion of the highest class there should properly be no such thing as a mere corridor or "passage"; the conventional passage should be widened into a gallery, for more stately effect, while still fulfilling its practical use as a means of communication from room to room. And it is in such galleries more particularly that there is opportunity for the use of stained glass in decorative and heraldic inventions. The author gives a few useful notes as to where the best glass of the period may be found—some of it not very well known; and he gives some interesting specimens of ornamental glazing from Walter Gedde's "Booke of Sundry Draughtes," of which we have reproduced two (fig. 6) which are of rather unusual and ingenious character. It is worth notice that Gedde describes the designs as "principally serving for Glasiers," but also as "not impertinent for Plasterers and Gardiners," a phrase which shows how this taste for geometric devices ran through everything in the decorative art of the period. If a man could make an ingenious diaper pattern for window glazing, he might just as well carry out the same idea in plaster rib-work or in garden-beds. The glass panel from Moreton Old Hall (fig. 7), of which the publisher has kindly lent us the block, is a bold and effective piece of work of its kind, and illustrates the period when Dutch strap-work was in vogue, forming an ornamental border to the shield with the family device.

The book concludes with two interesting chapters; one on "Sixteenth-Century House-Planning as Illustrated by John Thorpe's Drawings," in which a great many of Thorpe's plans and quasi-perspective elevations are collected for study and comparison, including a most curious and clever plan based on a hexagon, with circular stair towers in the re-entering angles; and one on the much vexed question as to the "Architectural Designs of the Sixteenth Century." The author's conclusion is that while men like Thorpe provided plans and "up-rights," each trade employed on the building provided it own details and that this accounts for what is otherwise puzzling—the diversity of details in buildings supposed to have been the work of the same architect; and probably that is about the truth of it.

Mr. Gotch's book, which is full of information, forms an excellent companion to Mr Blomfield's, the one being full where the other is more brief. The two together form a very complete history of English architecture from the sixteenth to the eighteenth centuries.

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NEW DECISIONS ON THE WORKMEN'S COMPENSATION ACT.

THE Court of Appeal, as some of our readers may have noticed, early last week began to sit solely for the purpose of clearing off the arrears in the list of appeals arising out of the Workmen's Compensation; it has already given during this last sitting several important decisions which are likely to affect the bearing of this Act in the immediate future. Perhaps the two of most interest are those which have thrown further light on that curious part of the Act, the limitation of compensation in the case of workmen on buildings to edifices exceeding thirty feet in height. In McGrath *v.* Neill, the question arose from what point the measurement of the building was to commence. The building on which the accident occurred was of brick, and the height from the bottom of the footings, above the concrete foundations, to the top of the building was more than 30 ft.; but it was contended on behalf of the employers that the proper place from which to measure was the ground, and if this test was right then the building was not 30 ft. high. This view, however, the Court would not accept. The object of the limitation was, it was said, to exempt small and unimportant buildings on which small and poor builders were at work. But as a vast building had a great deal of its wall below the ground level, it was impossible, in the opinion of the Court, to limit the Act as was desired by the counsel for the employers. There was, apparently, some obscurity in the evidence as to the extent, if any, to which the footings were covered in. The Master of the Rolls could, he said, see no evidence that there was more than a flooring at the top of the footings. From this statement we assume that had the footings been covered in by solid earth the Court would in that case have considered the ground level the proper commencement of the measurement. The practical result, therefore, of this decision seems to be that measurement, which is in every case a question of fact, should begin from the top of the foundation if the portion from this level is uncovered. The same point arose again in Knight *v.* Cubitt, but here the building, instead of being new, was old, and was in course of demolition. The whole of it was admittedly under 30 ft. high at the time of the accident in question, except the party wall. Here again the decision of the Court was in favour of the workman, it being held that a substantial part of the building, namely, the party wall, was more than 30 ft. high. If ever a statute of the realm gave rise to legal conundrums it is the Workmen's Compensation Act, and every decision in it in regard to the height of buildings shows most clearly what gross injustice it is to allow this limitation to remain in force. Had it happened that there had in the instance under notice been no party wall, it is obvious there would not have been any ground for the allowance of compensation; as it was the workman benefited by the fact that a bit, and a bit only, of the building of the requisite height was still in existence. It is equally obvious that, in the demolition of a building, a workman may be injured at two o'clock in the afternoon, when the building just exceeds 30 ft., and be entitled to compensation; at half-past two the same thing may occur, but as by this time some rows of bricks have been knocked off the walls the injured man is not entitled to a farthing.

In the same case a point of no little importance in these days, when old buildings have to give place to new, was also decided. Messrs. Cubitt had entered into a contract to demolish and rebuild some premises, and for the former purpose they employed an independent contractor, a house-breaker. The workman was employed by the latter, and not by Messrs. Cubitt, and the point was whether or not they were liable for the injury to the workman. We confess that we should have thought the point was clear enough. The first contractor is liable for sub-contracts, says the Act, unless the work done by the sub-contractor is "merely ancillary or incidental to and is no part of, or process in, the trade or business carried on by such undertaker." Clearly, if a firm undertakes to demolish and rebuild a house, the demolition is a substantial part of the contract. Here, again, the Act is not altogether just, because the line between what is and what is not ancillary to the contract entered into may be extraordinarily narrow.

Some decisions on the mode of estimating the compensation due to workmen who have been injured must now be noted. They have considerable bearing on the case of irregular employment. In Wheale *v.* the Rhymney Iron Company there was no regular contract of employment, but the man injured was engaged to work on a Wednesday, and continued to work every day, including Sunday, until the following Wednesday. The County Court judge took the average weekly earnings as being six times his daily pay, but it was urged by the employers that he should have taken half that sum, since the workman had not worked two full weeks, and therefore that the sum he had earned per day should be spread over two weeks. But the Court of Appeal agreed with the County Court judge; the man had worked for eight days, and therefore the rate per day was sufficient basis by which to arrive at the amount of compensation which, by the Schedule to the Act, in the case of a workman employed for less than three years was to be 156 times his average weekly earnings. In Bartlett *v.* Sutton the man who met with the accident had only worked for one day for the same employer. He was a casual labourer, and there was no evidence that he would have continued longer in the same engagement, though there was, perhaps, a possibility of it. In this case the Court took the single day as the basis of the average weekly wage in the employment of the same employer. This seems to be not altogther a fair average, because unquestionably most casual labourers would gain more in a week than a day's wage. But the Act is only an imperfect means of arriving at a standard of compensation—a rough and ready measure at the best, and if in such a case it is hard upon the workman, it might if more liberally construed be unjust in other cases to the employer.

This selection from the new decisions of the Court of Appeal includes those which are of most importance to the readers of this journal, and from them it will be obvious how desirable it had become that the appeals waiting for decision should be speedily dealt with by the Court.

NOTES.

Liverpool Cathedral.

WE give at the head of the next page a plan of what is called the St. James's Mount site proposed for the Liverpool Cathedral, though we may observe that there appears still to be no certain information as to what portion of this ground is really intended as the site of the Cathedral. From what has come out, informally, as to the ideas of the Committee, we may assume that the original proposal was to place the Cathedral on the portion of the ground which is called St. James's Mount, and which is here shown laid out as a garden. That site would have necessitated the placing the longer axis of the Cathedral north and south instead of east and west; and even then the width of the site is only just sufficient for the average measurement across the transepts of our English cathedrals. We do not regard the north and south alignment as a serious objection in itself, as, after all the east and west position has been only uniformly observed in England, and has not been a general rule in Christian churches elsewhere. If, however, the east and west alignment is desired, for the sake of uniformity with English practice, it is obvious that the choir must be built over ground which is now a cemetery, and monuments and graves must be disturbed to do this, which seems exceedingly undesirable. It may be added that the cemetery is formed at the bottom of an ancient quarry, and that there is a sheer drop of sixty or eighty feet, or thereabouts, between the level of the "Mount" and that of the cemetery. The plan serves to show how completely the site is devoid of any opportunity of central approach and vista; for a cathedral, in fact, it is what can only be called a hole-and-corner site. Mr. Myddelton Shallcross, a Liverpool architect who has already written forcibly on the subject, had an excellent letter in Tuesday's *Times* pointing out again the unsatisfactory nature of this site, and urging the Committee to take up what is called the London-road site, which has our strong approval and that of the Liverpool Architectural Society. This was followed however on Wednesday by a letter from Sir W. Forwood, as representing the Committee, stating that it was no use unsettling the minds of competitors by advocating another site, as the site had been definitely fixed at St. James's Mount and the levels were being taken. The fact of the levels having been taken, however, does not commit them to anything but the surveyor's fee, and we hope they will still reconsider their unwise decision, and abandon a site which, for the purpose of a large cathedral, may be said to have been condemned by the whole architectural profession.

Electrical Engineering in Germany.

IN a paper read this week to the Dublin local section of the Institution of Electrical Engineers by Mr. P. S. Sheardown an instructive account is given of the official visit by many members of the Institution to Germany last summer. What seems to have impressed English electricians most was the absence of crowding in German engineering works. The rooms were spacious, lofty, excellently lighted, well ventilated, and kept scrupulously clean. Many of the companies provided "Kasinos" for their workmen, which contain reading-rooms, dining-

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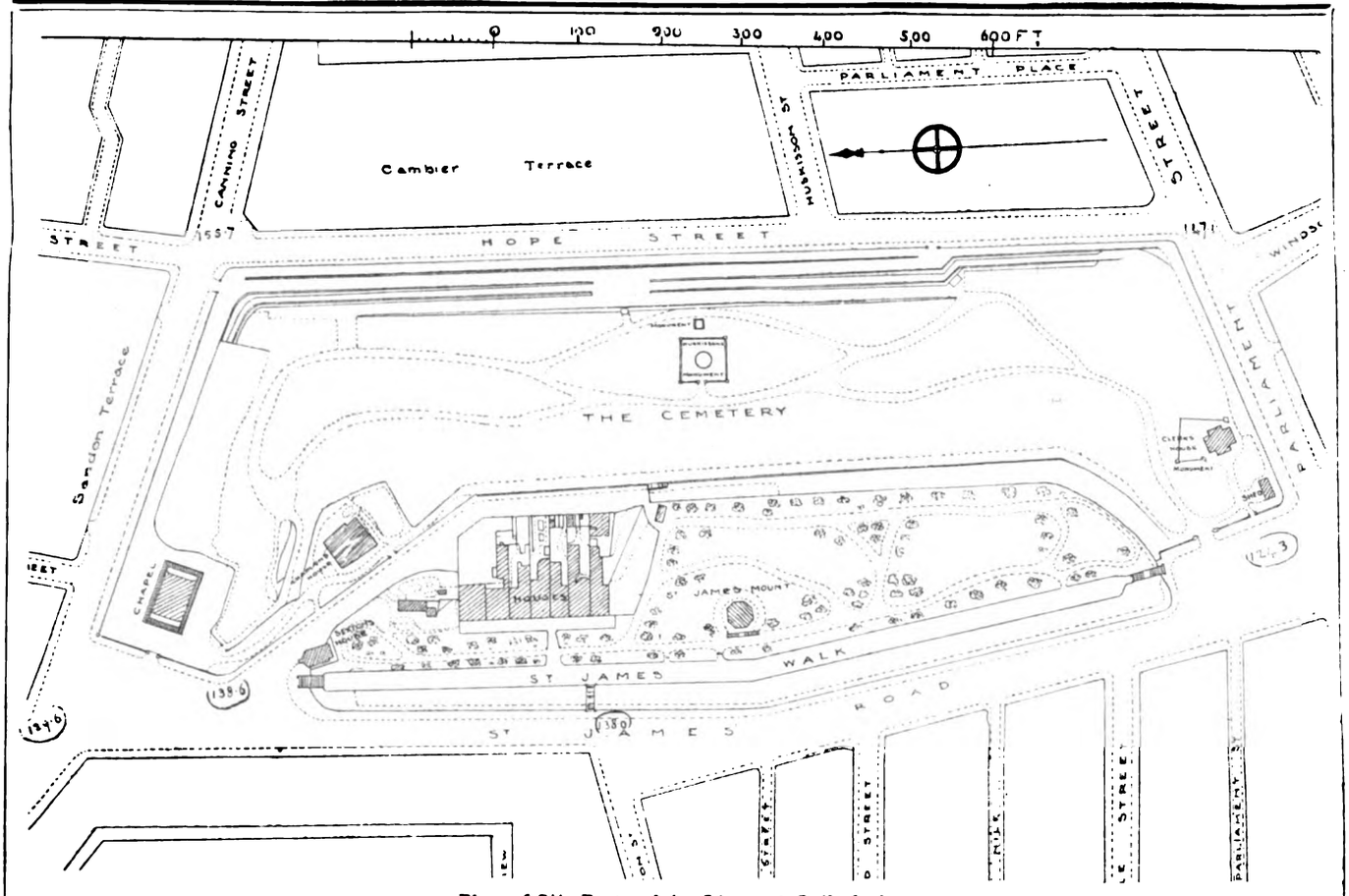

Plan of Site Proposed for Liverpool Cathedral.

rooms, bathrooms, &c., and where weekly lectures on scientific subjects were given by members of the staff and others. Another point which impressed the visitors was the almost entire absence of belts and shafting, the machines being nearly always driven by electric motors. This enables the lighting of the workshops to be done efficiently and economically by means of inverted arc lamps, the light being reflected from the ceiling into the room. Mr. Sheardown visited the high-speed electric railway which has been constructed between Berlin and Zossen for military purposes. He incidentally mentions that the electric motors make an alarming "purring" noise. Polyphase working seems to have made immense progress in Germany during the last five years. We think that this is mainly due to the very superior mathematical training given to the German electrician, which enables him to utilise the extraordinary adaptability of this system of working to all manner of practical problems. The visit to the Technical High School at Charlottenburg was most instructive. The complete and thoroughly up-to-date equipment of the school took English electricians by surprise. We are accustomed in this country to let students experiment with any antiquated dynamo, and to make measurements as best they can with old ammeters and voltmeters. It was a revelation to see students attaining an accuracy in their measurements which would more than satisfy practical requirements. Dr. Slaby, the principal of this school, has developed a system of wireless telegraphy which is rivalling the Marconi system, and Professor Josse, one of his colleagues, has shown that it is possible to get 30 per cent. more work from the "waste heat" of a steam engine by utilising it to work an auxiliary engine whose working substance is sulphur di-oxide.

"Burned by Retail."

Under this heading Mr. Blashill wrote a short letter to the *Times* last week commenting on the number of instances in which a death or deaths from fire occurred in the case of persons living over a shop filled with specially combustible materials. Mr. Blashill suggests that these minor cases of loss of life by fire, and the circumstances under which they occur, are not sufficiently considered, and that there ought to be legislation to the effect that the first floor of such houses should be compulsorily constructed so as to be so far fire-resisting as at least to give time for the fire-brigade to reach the spot before the fire had got so far as to render escape from the upper stories impossible. He adds "I should like to see any responsible person oppose an Act for bringing this about within five years." We quite agree with him.

The Thames as a Highway.

An address on "The Thames: its Tributaries, Banks, and Bridges," was delivered by Mr. Charles Welch on Thursday last week at the London Institution. The lecturer had little or nothing new to say, but, with the aid of excellent lantern views, he gave an interesting account of the river and the principal objects of interest associated with it, the survey actually extending from the source of the river to Gravesend. Perhaps the most interesting and useful part of the address was the description of the river as a grand highway in former times, and of the use the Court and Corporation made of it on occasions of public processions. He might have alluded to the possibility of the river being again used on such occasions, to say nothing of its more general use for purposes of every-day transit, for there appears to be no satisfactory reason why the Thames should not be used more than it is as a highway; and at a time when so much attention is being given to the subject of transit in London, it seems extraordinary that something is not done to make better use of the river. Why should not the Lord Mayor's Show, for instance, proceed along the Thames from London Bridge to Westminster, returning by way of the Embankment? There is plenty of space on the Embankment for sightseers, while, if this suggestion were adopted, many of the streets in which traffic is stopped or disorganised on such occasions would not be affected.

Hogarth's House, Chiswick.

In a "Note" on May 18 last we announced that a committee had been formed for raising a sum of about 1,500*l.* wherewith to rescue the house in Chiswick-lane from destruction, and to preserve it as a Hogarth Memorial and Museum. We observe that the property, which is copyhold and has about half an acre of garden, will be offered for sale at the Mart on November 25 current. We published an illustration of the house in our number of February 8, 1890. Hogarth bought it in or about 1750, and occupied it as a summer residence until his death on October 26, 1774, in Leicester-fields, leaving it to his widow, who demised it to her relative Mrs. Mary Lewis, who died in 1808; it then passed to some persons named in Mrs. Hogarth's will. The house was subsequently tenanted by Henry Cary, the translator of Dante. It was built in the earlier years of the eighteenth century of red stock brick, with rubbed brick dressings; on the first floor in the north and principal front is a bold wooden bay window, and it has a moulded wooden eaves-course. It is said that Hogarth planted the mulberry tree and that Garrick gave him the two leaden urns upon the gateposts. In 1890 the house—which had been not well cared for and let out in tenements—was taken by

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the Typographic Etching Co. for the Hogarth Works. It is to be hoped that, even at the eleventh hour, some means may be found to purchase this interesting house and save it for the nation.

Palace-gate, Kensington.

By direction of the late Sir John Millais' trustees, No. 2, Palace-gate will shortly be offered for sale at auction. The property has a frontage of about 80 ft. on the east side of the road, and occupies an area of about 7,400 ft. The house was built for Sir John Millais, P.R.A., on a plot of ground which he bought from Messrs. Cubitt & Co., who built it for him, after the plans and designs of P. C. Hardwick: it is illustrated in the *Builder* of June 10, 1876. The entrance hall measures 29 ft. by 26 ft.; on the first floor landing is a fountain by Sir Edgar Boehm, and on the first floor is the studio, 56 ft. by 49 ft., and 24 ft. high. The design is after the Italian style, carried out in red brick, with dressings of Portland stone.

Church of All Hallows-on-the-Wall, London.

On Thursday last week, at a sitting of the Consistory Court of London, Dr. Tristram, K.C., Chancellor of the Diocese, agreed to grant a faculty, after a novel kind, in respect of this church. The Rector and Churchwardens applied for powers enabling them to provide increased accommodation for the celebration of morning service for men who arrive at Broad-street and Liverpool-street stations by workmen's early trains, yet must wait an hour or longer before they can begin their work. During some while past about 200 women and girls have attended the early services in the church, which has sitting room for 184 persons, and a tent for men has been fitted up in the churchyard for congregations of about eighty men. The proposed building, which will cost about 1,000*l.*, is to be erected at the east end of, and will communicate with, the church. All Hallows was built in 1765-7, at a cost of 2,941*l.*, after the designs of George Dance the younger, and contains a monument, with bust, of John Patience, architect, and a copy of P. da Cortona's picture of Ananias restoring sight to Paul, which Sir N. Dance painted and presented as an altar-piece. Of the former church we published, on April 25, 1885, a view taken from the series of engravings published by R. West and W. H. Toms—the view being engraved by Toms after a drawing by R. West, 1736, together with Toms's account, which he manifestly copied *verbatim* from Hatton's "New View" of 1708. The present fabric was thoroughly renovated at a cost of about 1,700*l.* in 1897-8 by the late Sir Arthur Blomfield. In 1894-5 the Metropolitan Public Gardens Association laid out the churchyard that abuts against a piece of the old City wall which separates it from the gardens of some houses in New Broad-street; the Vestry, it is said, stands upon a bastion of the wall.

A Vitreous Fresco Process.

Messrs. Simpson & Sons, the well-known firm of decorators, have produced what they claim to be a permanent vitreous fresco decoration. The new material is an earthenware, upon which the fresco painting is made and fused in by a burning process. This vitreous earthenware is prepared in slabs about 8 in. square, ¾ of an inch thick. The surface is capable of various texture, the roughest surface being used for draperies and backgrounds, and smoother faced pieces are used for the flesh and more delicate draperies. The material is cut into shapes following as far as possible the lines of the design, as in the case of a leaded light window. The back of the material is roughed as a key for the cement, by which the whole is fixed in position, forming a concrete mass with the brickwork or other building material to which it is attached. Messrs. Simpson & Sons say that it is only half as costly as mosaic, and claim that it does not hold the dust and soot as mosaic does when used in this country. That is reasonable. The life of mosaic depends not merely on the material and design, but on the pieces being on varied planes and at different angles, which gives a rugged surface that will hold any amount of dirt. There is room for Messrs. Simpson's experiment, whether under the title of fresco or colour decoration. We imagine the process itself is more akin to the Della Robbia earthenware, without the glossy glaze, than to fresco painting, which mellows with age. With such a permanent material none but the most accomplished decorative artists should be allowed to perpetuate their work.

The New English Art Club.

The exhibition of the New English Art Club includes among its eccentricities a few very interesting and powerful studies in style, in landscape especially. Mr. Muirhead's "The Water Mill" (100) has a touch of Constable about it; Professor Brown's "Woolhampton" (90) seems rather like a new application of the method of Diaz; Mr. W. H. Bell's "The Pond—Early Spring" (103) is a bright sketch full of light; Mr. Wilson Steer's "The Grove" (116) a good sketch of the effect of light through foliage; Mr. W. W. Russell's "Chepstow" (127) is a fine landscape in every sense; Mr. Sims has got a powerful effect of storm in the interrupted picnic (133), and Miss Alice Fanner shows her usual fine open-air effect in "Breezy Day on a Farm Datchett" (142). Mr. Orpen paints two interiors with the same not very beautiful young woman inhabiting them—"A Window in a London Street" (69) and "The Window Seat" (130); unfinished interiors, but treated with originality and effect. Architecture suffers badly at the hands of some of the members; Mr. Walter Sickert's "St. Jacques" (125) appears to be a building constructed of mud; in Mr. Bernard Sickert's "Groote Kerk, Dordrecht" (122), the tower is not upright; and Mr. Brabazon asks us to accept shapeless splashes of colour at all angles as buildings. In contrast to these Mr. MacColl's "Belfry and Watch-tower of Calais" (5) is a good little architectural picture; so is Mr. Fry's "Chantilly" (54). The best picture in the whole collection is perhaps Mr. Walter Osborne's "The Lustre Jug" (77), a sketchy interior with figures and bric-à-brac which shows great power in its way.

The Modern Gallery.

At the Modern Gallery there is a collection of water-colour drawings by Mr. Herbert J. Finn, whose architectural pictures we have noticed before at this gallery; in this case the collection is diversified by a good many sketches and studies of landscape. From an architect's point of view, as we have before suggested, Mr. Finn treats cathedrals too much in the spirit of a landscape-painter; their degree of surface decay is in many cases exaggerated for the sake of picturesque effect. This is the case in nearly all the studies of Lincoln Cathedral, the greater part of which is, in fact, in remarkably good preservation considering its age. The large view of "Durham Cathedral — Evening" (52) has not this defect, and is a very fine work both in colour and composition. "Durham Cathedral—Morning" (62) is a morning mist effect with the towers reduced to silhouettes; the effect is finely rendered, but the towers are too lofty in proportion, the centre one especially. The west front of Ely is shown with the south turret very much out of perpendicular, leaning away from the centre; we do not recollect any such marked settlement as is shown here, nor is there any indication of it in a photograph which we have before us; at all events we should think it is exaggerated. The west front of York Minster, again, is much cleaner and sharper in line, all except the lowest portion, than is here shown. This kind of picturesque treatmeht of buildings is probably the most pleasing to painters, but it does not satisfy architects. All the drawings from Winfield Manor, in making which the artist seems to have been in a more architectural mood, are satisfactory in this respect, and show a good and solid masonry texture; "The Crypt, Winfield" (51) is especially good. We were much interested in Mr. Finn's landscape sketches, which, though slight, and apparently done for the sake of a diversion from his architectural pictures, show so much feeling for colour and effect in landscape that we would suggest that he would do well to give more of his time and ability to this class of subject.

Society of British Artists.

The exhibition of the Society of British Artists in Suffolk-street presents, as usual, a melancholy superficies of artistic commonplaces; but there are a few works worth picking out from their surroundings. Among these is Mr. Foweraker's "Exeter Quay" (100), a fine work both in colour and composition. Among other pleasing landscapes are Mr. Walter Fowler's "Early Autumn" (8) and "On the Norfolk Marshes" (103), and various small landscapes by Mr. Val Davis (35), Mr. J. E. Jacobs (48), Mr. Westley Manning (45), Mr. A. E. Proctor (64), Mr. F. Spenlove-Spenlove (99 and 226), and Mr. Whitehead (118). Mr. Foottet's "Pont Neuf, Paris" (112), seen under a special effect of light, is clever, though looking rather like a stage effect than a genuine one. Mr. R. C. Bunny has aimed at something higher in his figure-picture under "L'Age d'Or" (67), there is a fine sense of colour in this, though it rather suggests an attempt to imitate Mr. G. F. Watts. The President (Sir Wyke Bayliss) exhibits, as usual, some highly-wrought interiors of cathedrals—"Malines" (81) and "Interior of the Duomo Pisa" (265), and there is also an able painting of the interior of "S. Sophia, Constantinople" (328), by Mr. Henderson, whose illustrations of S. Sophia in our pages will be remembered by some of our readers. The screen of small sketches by Mr. Lenfestey is of considerable interest.

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Messrs. Dowdeswell's Gallery.

At Messrs. Dowdeswell's Gallery in New Bond-street is to be seen, under the circumstances of artificial lighting apparently considered appropriate for religious pictures, M. Eugène Burnand's large painting, "Christ's Prayer after the Last Supper"—a fine and serious work which does not stand in need of any such adventitious aid to its effect. The scheme of colour is somewhat conventional, the artist having evidently aimed at keeping all the costumes and surroundings nearly colourless in order to concentrate the effect on the heads of Christ and the apostles; there is a white wall behind, its surface only broken by a shallow wall arcade, and the white tablecloth in front, the line of the table cutting level across the centre of the picture, the remains of the supper being all removed so as to leave no disturbing detail. The contrivance is a little too obvious and gives the scene the air of being rather symbolic than real; but perhaps this was the intention. The figure of Christ, facing the spectator in the centre, is treated with sculpturesque severity, the drapery falling in straight vertical lines; those of the eleven apostles (for this of course is after the disappearance of Judas) fall into more variety of line and pose, contrasting with the central figure. The apostles' heads are a series of very interesting studies, full of force and character; that of Christ is of the usually accepted type, and is solemn and spiritual in expression. Altogether this impresses one as a religious picture painted with sincerity and seriousness of aim; a picture better suited, it is true, to the church than to the picture-gallery; but is not that exactly the feeling which a painting of such a subject should suggest?

EGYPT EXPLORATION FUND:

GENERAL MEETING OF MEMBERS.

The fifteenth ordinary general meeting of the Council and members of the Egypt Exploration Fund was held at the Society of Antiquaries, Burlington House, on Thursday evening, 7th inst., Sir John Evans, the President, in the chair.

The Rev. R. A. Bullen proposed the re-election of the members of the Committee, the only change being the substitution of the name of Mr. Herbert Thompson for that of Sir Hermann Weber, M.D.

This was seconded by Mr. Sewell and adopted.

Mr. J. S. Cotton and the Rev. W. C. Winslow (Boston, U.S.A.) were re-elected hon. secretaries, and Messrs. H. A. Grueber, F.S.A., and F. C. Foster (Boston, U.S.A.) hon. treasurers.

The Hon. Treasurer then read his Report, which showed that the financial position of the Fund was much better than last year. It was mentioned in the first instance that the affiliated branch at New York had ceased to exist; but this loss was more than compensated by a new branch which had been established at Pittsburg, and from which they had received large contributions. As to the Exploration Fund, the total disbursements had been 2,351*l.* 1s. 8d., made up as follows:—1. By the expedition account, 1,443*l.* 2s. 10d., being the amount incurred on the work done at Abydos under Professor Petrie. 2. By publications they had spent 366*l.* 15s. 11d., which included, besides the proportioned charges for the Archæological and Annual Reports, the remaining outlay on "Dendereh and the Royal Tombs," vol. i., and on the extra volume, "Diospolis Parva," by Professor Petrie, &c. 3. Various other items of expenditure which were stated. The total receipts over the same period had been 3,788*l.* 11s. 8d., and they were able this year to carry over to their credit a balance of no less than 1,437*l.* 10s., even after providing for the deficiency of 181*l.* 15s. 3d. of last year. In the archæological survey the total disbursements during 1900-1901 had been 523*l.* 8s. 5d., and the receipts 723*l.* 0s. 4d. In the Græco-Roman branch the payments had amounted to 1,016*l.* 16s. 8d., of which 459*l.* 19s. 4d. was devoted to the expedition account, which included the excavations conducted by Mr. Grenfell and Mr. Hunt at Rubbyyat; and the receipts of the branch over the same period were 1,170*l.* 15s. 10d. Last year there was a considerable falling off in subscriptions, but this year they had recovered their position, for those in England showed a considerable advance, while those from America were more than doubled.

The President then read a short address. He commenced by referring to the losses the Fund had sustained by the death of Sir Greville Smyth, of Ashton Court, near Bristol, who was for many years a subscriber to the Exploration Fund; Mr. Arthur Cates, the well-known architect and architectural adviser to the Woods and Forests, who took a warm interest in the study of antiquity; and Mr. Joseph John Tylor, the eldest son of the late Mr. Alfred Tylor, F.G.S., who forty years ago was busily occupied with the discovery of flint implements fashioned by the hand of man in the gravels of the river Somme, near Amiens. Mr. Tylor's acquaintance with Egypt originated in a visit to that country in pursuit of health, but he soon became absorbed in the interest of carrying on excavations, and one of his principal aims was to obtain and preserve absolutely accurate reproductions of wall-paintings and hieroglyphic inscriptions on Egyptian monuments; and as a means towards this end he combined the use of photography with careful finishing by the hand and brush. It has been said of his series of the "Wall Drawings and Monuments of El Keb," published from 1895 to 1900, that they present as near an approach to absolute reproduction, even to the texture of the material represented, as has ever been attained. Referring to the scene of their operations during the past season, he observed that by the presence of re-used vases, and by the style of the sealings, Professor Petrie had succeeded in placing the tombs of the kings in a fairly trustworthy chronological sequence. The share of the spoil which was allowed to come to England was, in accordance with former precedents, exhibited during the month of July at University College, to the authorities of which they were much indebted, and also to the Museum authorities at Cairo for the equitable—if not, indeed, liberal—manner in which the produce of the excavations had been divided. Among the objects retained at Cairo were the four remarkable and artistic bracelets, of which coloured representations were given in the frontispiece to their volume. Their history was romantic. It would seem as if at a time when the tomb was anciently plundered the mummy of the queen of Zer or Teta, the second King of the First Dynasty, was broken in pieces, and a fragment of the forearm placed by one of the plunderers in a hole in the wall. For more than 1,000 years offerings were made at the Osiris shrine into which the tomb had been converted in the days of Amen-hetep III., and thousands of visitors must have passed within a few feet of the fragment, but without disturbing it. The Copts destroyed the shrine, and the *Mission Amélineau* cleared the tomb, but still the arm lay untouched; but at last it came under the notice of Professor Flinders Petrie's workmen, and was brought to him, the bandages carefully removed and the bracelets brought to light. They were probably the earliest examples of female jewellery known, dating back as they seem to do to about 4,700 years before Christ. Among the objects exhibited in London might be mentioned the sceptre and the gold-capped marble vases of the seventh and last king of the Eleventh Dynasty, dating from about 4200 B.C. The sceptre was built up of pierced cylinders of card placed upon a central core of copper and had originally been at least 26 in. in length. A large stele of Fer-ab-sen had gone to the British Museum and a curved bar of gold with the name of Aha to Chicago. The whole collection had now been divided mainly between the United Kingdom, including her Colonies and the United States of America, but portions had also been assigned to some European States, the principle of division adopted being that each country should, as far as possible, share *pro ratâ* in accordance with the amount that each had contributed to the Fund. In reference to Professor Petrie's work on "Diospolis Parva," he had one point of difference with the author as to describing the period of which he treated as the "Prehistoric Period." He would rather term it the "Pre-dynastic," and thus limit it to Egypt and connect it with dynastic times. To regard a single cemetery in Egypt as representing half the prehistoric period, and to devote only three-tenths of the whole period to the days when metal was not known—for copper implements come in at the beginning of the series—seemed to him to be absolutely in disaccordance with what we knew of the neolithic period in other parts of the world, and to be entirely out of proportion even when regarded from the Egyptian point of view. The term "pre-dynastic" got rid of all those difficulties. Another publication of the Fund, which would now shortly appear, was "The Temple of Deir El Bahari," No. IV., which would comprise plates relating principally to the Temple of Hathor and the southern Hall of Offerings. The wall-paintings were of great interest, and the long religious texts subsequently incorporated into the Book of the Dead were worthy of notice, especially as Mr. Naville had offered a translation of one of them which somewhat differed from that of other authorities. The archæologieal survey had during the past year produced two volumes, one of which, however, was only on the point of being issued. The first of these was Ptah-hetep, Part II. The second was a detailed account of the Rock Tombs of Sheik Said, prepared by Mr. M. de Garis Davies. The tombs, according to the list, were 102 in number, and belonged in the main to the ancient kingdom. The memoir was illustrated by thirty-four plates, and would be found full of archæological information. With regard to the Græco-Roman branch, the Report was less satisfactory, though the volume of Fayoum papyri had for some time been in the hands of subscribers. The study of papyri required both time and daylight, and he feared that Messrs. Grenfell and Hunt had during the past year undertaken tasks for which these two necessaries hardly sufficed. The examination and publication of Lord Amherst of Hackney's fine collection was a grave undertaking, and the editors were to be congratulated on the completion of their work. When, however, they undertook for Mrs. Hearst, of California, the editing of the Ptolemaic papyri, the time left at their disposal for the work of the Græco-Roman branch was fearfully curtailed, and but little could be done. It was hoped that an arrangement could be made by which a copy of this volume would be sent to each subscriber to the branch in lieu of the ordinary annual volume, or possibly of two; and if the papyri were of the character which he had heard assigned to them, he believed that they would have reason to be satisfied with the arrangement. Mr. Grenfell informed him that the papyri came from the cases of mummies of crocodiles, and that many of them were of extremely large size and well preserved. They all belonged to the period between B.C. 130 and 80, and were for the internal history of Egypt of great importance. The most remarkable, perhaps, constituted a series of forty-five decrees of Ptolemy Euergates II. on a great variety of subjects. Official documents of all kinds were strongly represented, the source of a large proportion of the papyri having apparently been the bureau of the village scribe, who also kept the official archives of the place. Among literary fragments there were portions of two or three anthologies, including part of a chorus of a tragedy dealing with Iphigenia. A special feature of interest was that these documents formed a sort of pendant to the Petrie papyri, and carried on the history of the military colony in the Fayoum to its later developments. *Inter alia*, they went far to solve some of the most vexed questions with regard to Ptolemaic numismatics. The address concluded with a few remarks on the present position and hopeful future prospects of Egyptian archæology.

The Hon. Secretary, Mr. J. S. Cotton, then read his Report, in which he observed that from an administrative point of view the chief feature of the past year had been the strengthening of their connexion with the United States. The two old affiliated branches of Philadelphia and Chicago were now both represented on the Committee by Americans—Major Cassatt, Military Attaché at the Embassy, and Mr. Louis Dyer, who was as well known at Oxford as at his original University of Harvard. From the Boston office they had received this year the equivalent of 10,000 dols., instead of 6,000 dols. last year. It must always be borne in mind that these liberal contributions from America

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were frankly sent in view of a return in the form of antiquities and papyri for American museums and libraries. In accordance with their rule of following strictly the proportion of local contributions, the American share had been divided between five great museums—at New York, Boston, Philadelphia, Pittsburg, and Chicago.

Professor Petrie then read the following address :—

"This year we have the satisfaction of completing the most important historical work that had yet come into our hands. The continuous order of seventeen kings has been established, and the very foundations of Egyptian history have been settled in a manner which has hitherto seemed entirely beyond hope. The Royal cemetery of the tombs of the Kings at Thebes, belonging to the Eighteenth-Nineteenth Dynasties, and that of the pyramid-builders at Memphis of the Fourth-Sixth Dynasties, are the only series of Royal tombs yet known, and neither of those had added anything to the history, which was already fixed by other monuments. But the recovery of the Royal tombs of the earliest dynasties has given us not only another Royal cemetery, but has provided the only contemporary history of their time, and completely vindicated the historical character of the lists which had been preserved by later ages. The criticism of myths had told us that Mena, the founder of the Egyptian monarchy, was but a form of Manu, the lawgiver of India, and of Minos, the hero of Crete ; and to hope for tangible monuments of his time was but seeing castles in cloudland. Now the long line of a dozen kings back to Mena is clear before us ; we have seen and handled the gold, the crystal, the ivory, with his name and engravings, and even the kings who went before him are better known to us by actual objects than are half the Saxon kings of England. No such complete materialisation of history has been obtained at one stroke from any other country or age. And such a result was least to be expected from ground which had been pronounced exhausted, the last clearance of which unhappily had just been made before our work there. That previous clearance has not restored a single detail of the succession of the names, nor identified the historical position of a single king. It has only swept away the greater part of the materials, and left a chaos of destruction behind it. The whole of what we have covered by our work was from the overlooked residue which had escaped all the plunderers ; that invisible margin was the total of what we had to use, and that, a hundredth of all that had existed there, has sufficed to reconstruct the historic fabric. So difficult is it to really destroy history that we may now say that our methods—which will doubtless be improved—can resuscitate knowledge of a period of which the remains have been destroyed time after time by zeal and greed. By the use of a trained body of workmen, who had been taught in past years to notice and preserve the objects in their work, we recovered a far larger amount of material than we had hoped for. The splendid bracelets of gold and jewels, the gold bar of Mena, the gold sceptre, the gold-capped vases, were beyond all expectation ; and the more instructive remains include about twenty engraved tablets and dozens of fragments, five Royal tombstones and 150 private tombstones, over 200 different sealings, nearly 100 inscriptions on stone vases, 800 stone vases restored, and many hundred of small objects of the greatest interest as illustrating the civilisation. Altogether, in the two volumes issued to you there are over 500 photographs, over 2,000 drawings, and nearly 2,000 marks, besides the full and detailed plans and sections of the whole of the tombs. None of this mass of material, which alone has enabled us to restore the earliest dynasties, would ever have been known had we been content to leave the subject where the common routine of excavation had already abandoned it. You see before you on the largest scale an object-lesson on the futility and destructiveness of a mode of work which was no worse than the greater part of what has been perpetrated in Egypt in the name of excavations during the last hundred years. Now there awaits us yet the great temple site of Abydos, the ground of the earliest temple, that of Osiris. It has been largely dug over for earth, and some monuments have been removed, but the lower levels of it are yet untouched. It seems that this was probably the burial-place of the head of Osiris, the great relic which drew around it the burials of the historic times, and probably also was surrounded by those of the earliest dynasties, as one such grave has been found there by accident. The site is a very large one, about 500 ft. by 1,000 ft., or three times the size of the whole of Trafalgar-square and its roads, and it will have to be turned over 12 ft. deep. If we get a third of that, or as much as Trafalgar-square, turned over in the course of a season, that will be as much as one can expect, so that some three years will be occupied in undertaking this great site. It is in that ground that we may hope to find tombs of the earliest historic time, and carvings in stone and ivory of the primitive kings, like those from Hierakonopolis. Our treasurer must appeal to you to ensure that this most promising site of all Egypt is thoroughly and finally explored. It is now twenty-one years since I first began work in Egypt ; Mariette then ruled, and this Fund was yet unborn. In those days the Pyramid of Khufu was our boundary of history ; nothing whatever was known of the archæology of Egypt as a comparative science, and no trace of Europe in Egypt was thought of, earlier than the Ptolemies. The situation now is completely different. The monumental history has been carried back to the very beginning of the written record, which has been entirely confirmed ; and, beyond all that, the whole course of the prehistoric civilisation has been mapped out for perhaps 2,000 years more completely than has been done for such ages in any other land. The archæology is better known than that of the most familiar countries ; not a vase or a bead, not an ornament or a carving, but what falls into place with known examples, and can be closely dated. The connexion with Europe has been led back to the beginning of Greek records, then to the Mycenæan times, next to the Twelfth Dynasty, and now even to the First Dynasty, and Egypt is the sounding line for the unmeasured abysses of European history. No such opening of new fields to the mind has come to pass since the days when the Renaissance scholars burst into the world of lost Classic authors ; even the surprising unfolding of Assyria and Babylonia lacks the historic completion of the Egyptian record, and is still almost untouched in its archæology and development. We cannot expect the next twenty-one years to be as potent as that which we have seen, for the great outlines are now laid down ; but many a dim passage in the long course of the history yet awaits the light, and it will be the duty of the new century to fill in, as far as possible, the details of the picture which has been sketched in the last few years."

The Chairman expressed the thanks of the meeting to Professor Petrie for his very able and interesting address, and remarked that no one had done so much for England to unravel Egyptian history as he had. He congratulated the Professor on the great success he had achieved at Abydos. The work he was about to undertake would not be completed for three years, and he wished him success.

The vote having been accorded, Judge Baylis proposed a vote of thanks to the chairman, remarking that he was glad that the Fund realised what great services he was rendering to them by accepting the presidency.

Mr. D. Hogarth seconded, and expressed a hope that the explorations would be continued in the Delta of Egypt.

The Chairman, replying, remarked that the discoveries in Egypt were very important, and he was greatly interested in the movement. He was glad to find the finances in such a healthy condition, and he had no doubt that the result of the next few years' inquiry by Professor Petrie would yield valuable information.

This concluded the meeting.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—The usual meeting of this Society was held on Friday evening, the 8th inst., Mr. James McKissack, President, in the chair. Papers were read by Messrs. Robt. Stuart and D. S. Pringle on Soft Woods and Hard Woods respectively. Each essayist described the growing timber and its conversion into various market forms, with descriptions of many of the trees of each respective class. Such points as the relative durability and prices of timbers, and the suitability and adaptation of these to various works, were discussed by the members, whose thanks were conveyed to the lecturers for their instructive and eminently practical papers.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE second meeting of the present session of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, W., on Friday, the 8th inst., at 7.30 p.m.

Mr. R. H. Weymouth was in the chair, supported by the hon. secs., Messrs. J. H. Pearson and H. Gregory Collins. There was a good attendance, and the book was signed by twenty-one members and ten visitors. Several questions were asked during question time and replied to by members.

The Chairman then called upon Mr. W. E. Davis to read a paper entitled "The Finishing of a Dwelling-House," which dealt, in a practical and interesting manner, with the many difficulties which beset the path of the architect, and which is printed nearly in full below.

The discussion was opened by Mr. H. P. Maule, who proposed a vote of thanks to the author, which was seconded by Mr. Lishman, and the discussion was carried on in a hearty manner by Messrs. Greenop, Geoffrey Lucas, J. H. Pearson, L. Hunt, Max Clarke, and the Chairman.

The Special Visitor, Mr. Walter J. Millard, was then asked by the Chairman to sum up the discussion which had resulted from such an excellent paper.

Mr. Millard said the subject had been treated in a very exhaustive manner. He quite agreed with all the remarks of the author that it was most important to give every attention to minor matters when planning the dwelling-house, and that it was necessary to show some forethought in matters of detail. We should combine the practical with the artistic, but, above all, he wished to impress upon the minds of the younger men the desirability of practising restraint in their work. It was essential that the cupboards and fittings should be designed by the architect, and that the client should be consulted in all matters.

A vote of thanks to Mr. Davis for his valuable and practical paper, and to Mr. Millard for so kindly attending as Special Visitor, also to Mr. Max Clarke and Mr. H. P. Maule, was passed with acclamation. Mr. Davis having replied, the meeting terminated. It was announced that the next meeting would be held on Friday, the 22nd inst., when Mr. G. H. Smith has promised to read a paper illustrated by lantern slides on "Canterbury Cathedral."

FINISHING A DWELLING-HOUSE.*

THERE are two persons to whom a man shows a most commendable modesty as to his financial position ; the opportunity in the one case recurs annually, and in the other not so frequently. The first individual is the Income-tax surveyor, the other his architect ; but, while in the latter case he is so modest as to his means (sometimes this display of modesty commences as early as arranging for special fees), when he comes to his requirements he throws modesty and every other virtue to the winds. The result is, that instructions having been given for the preparation of the drawings, the client frequently calls during their preparation and suggests that he wants this, that, and the other, and that his wife wishes for something else ; the architect unconsciously adding and adding, until the approximate estimate given at the commencement of negotiations would, upon a little consideration, look somewhat foolish. These approximate estimates are another source of trouble to the architect. He is generally expected to give an idea of the cost, "roughly, of course," says the client, at the same time making a very keen mental note of the amount, to be brought up later for the architect's discomfiture, when he, poor modest man, afraid of offending his patron, does not like to mention his (the patron's) liability for the extra cost. Of course I leave out of consideration those architects of whom I have heard, but with whom I have fortunately had few dealings, who purposely deceive their clients as to the probable cost of the work, hoping thus to commit them to something, and trusting to luck to get out of the hole they have got into by their dishonesty. These individuals are not worthy of our commiseration.

However, to return to the case under consideration. The drawings are prepared, and

* A paper read at the Discussion Section of the Architectural Association, on the 8th inst., by Mr. W. E. Davis.

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som times he specification, and if the architect is wise the quantities also—but not by the architect; as to this, I would refer you to the paper read here about twelve months ago by Mr Buss. The tenders arrive and are opened; then follows the little speech that we know so well, "Thank you, gentlemen, for your tenders; they are all higher than I anticipated—in fact, considerably more than my client is prepared to spend." Later on comes the "cutting-down" stage, the detestable job hated by all. The architect is naturally anxious to get his job started, so that he sometimes lapses from that discretion that ought always to characterise an architect's actions. Be it said to his credit that he sacrifices himself upon the altar of economy, the first item in the reduction bill being his last hope of salvation at the final settlement of accounts—the provision for contingencies. Then comes those items which he persuades himself should be considered as furnishing, viz., cupboards and shelving, plate rack, hat and coat rails, and I have even known the kitchen dresser to go. Sometimes this is with the cognisance of the male half of the client, he suggesting that they have a number of old cupboards and shelves which they must use, &c., and so on. These remarks, I should explain, are in extenuation of the architect, lest it be considered that I am blaming him for lack of consideration of the requirements of the modern dwelling-house, when I know that he, of all men, is a creature of circumstance.

It being frequently the lot of the unfortunate surveyor to spend anything from days to weeks in a new house, during the early days of its occupation by the client and his family, for the purpose of dealing with that portion of his work known as E's and O's—more often than not there is a preponderance of the former—he generally gets a few candid opinions from the mistress of the house as to the shortcomings of the architect, with whom, for obvious reasons, he is anxious to keep upon the best of terms. It is, of course, the mistress of the house who claims—and rightly so—to be the supreme judge as to the household working of the establishment.

Sometimes the lady of the house raises various little points by putting conundrums, such as:—"How does Mr. So-and-so think we are going to clean the outside of those windows?" of which only one out of two or three lights are made to open, and that outwards. It certainly is a puzzle, and the only way that suggests itself to the unfortunate individual addressed is a ladder; but being a wise man, he does not offer this suggestion, and, thinking of his friend the architect, meekly remarks that "It is a little awkward." "A little?" replies the lady with emphasis and scorn, and then turns away with an expression that leaves you in little doubt, that in her opinion, you are as bad as the architect. Now this is only a comparatively small matter, but a very important one to a good housekeeper, and should be avoided by the architect, if he is desirous of being able to visit his clients, without being continually reminded of his weak points. The only way that occurs to me to avoid the trouble, except the rather doubtful benefit of making his casements to open inwards, is to make the whole of the lights of his windows in three lights or less to open. Personally, I think the old-fashioned (or must it be considered by comparison new?) sash and frame preferable on all points, especially the very important one of ventilation. For myself—and I do not think I am singular in this respect—I like to have my bedroom window always open at the top; but when it has been my misfortune to sleep in a room lighted by casements, I have had in cold weather reluctantly to forego this luxury. In the summer, too, I have had more than once to get up to close the window on account of the rain entering; so that, taking all things into account, for bedrooms especially, there is nothing to compare with the sash window for usefulness. Please bear in mind that this was to be a practical paper, and not an artistic one.

Another trouble, and another little conversation—"When we came here there was not a single cupboard or shelf in the place." The victim's mind recurs to the Reduction Bill, Item 2, "Omission of Cupboards and Shelving," Item 1 being "Omission of Provision for Contingencies." Now he is in a dilemma. The surveyor, being generally a much married man himself, dares not repeat the remarks of the master of the house when arranging the reductions. He therefore maintains a discreet silence; but, at the same time, it is painful to him to hear his friend and patron, the architect, roundly abused, when he knows that this abuse is not merited. He therefore decides to advise him not to omit these items in the future, unless authorised by the *mistress* of the house, if he wishes to keep a friend in that direction.

While upon the question of cupboards, there is that vexed topic, the dust trap, *alias* cupboard top; being out of sight, it is generally out of mind also, and, therefore, is not always so well finished as it might be, and the cornice being frequently fixed with its top edge slightly above the level of the cupboard top, makes it almost impossible to keep clean. It has often occurred to me that cupboards, in bedrooms at least, being generally fixed in the recesses at the sides of the chimney breast, it would be better to take the bull by the horns, and arch over the recess, building up solid above; the little loss of air space being more than compensated for by the absence of the dust trap. Kitchen cupboards may run up to the ceiling, for, being in constant use, the objection to the upper tiers of shelves does not obtain, but I do not think that anything over 7 ft. or 8 ft. is advisable in bedrooms.

Do not have wide doors to cupboards; two narrow folding-doors cause much less obstruction in a room than one wide single one. This is again a comparatively small point, but has been impressed upon me more than once, especially where space is limited.

Akin to the last is the question of hat and coat space. Get this, if possible; a space where the master can keep those aids to comfort which he uses when he throws off the polished glory of the city for the freedom of his own garden. This should be off the hall, but not in such a conspicuous position that it is the first object met with upon entering the house. A recess can generally be formed under the stairs if there is no basement, by leaving part of the space open, instead of enclosing it all as a cupboard. This is, of course, in addition to the usual hat and coat arrangement, where the silver-knobbed umbrellas, and the shiny top hat can be displayed without disgracing the family. I ought perhaps, here to explain, that I have generally taken something considerably less than a mansion in my examples, where comfort, rather than display, is the chief factor.

The question of ventilation, I doubt not all will agree, is one of the utmost importance, which, however, I am afraid, is not appreciated, except—to use an Hibernianism—when it is absent. Where an attempt has been made to deal with it, it is often attended with so much discomfort by the clattering of mica flaps, that we find them, sooner or later, papered over. Where this is not done, they are always conspicuous to the sight, as well as the hearing, by the black patch on the ceiling and wall around, notwithstanding the maker's assertion that they are smoke-proof. Moreover, the requirements of Building Acts, by which ventilators in smoke-flues are to be kept at least 12 in. below the ceiling, rob them of a great deal of their efficiency. The slight extra brickwork required for a separate vent-flue from each room, when silk flap ventilators close to the ceiling can be used, is a good investment, and nothing in my experience works better than a louvred grating in each side of the stack, just below the pot. As an inlet, my old friend the sash window is again to the fore, especially when fitted with the deep sill bead. With this we get as near that grand thing, "ventilation without draught,' as is possible. Of course, I am aware that there are numerous inlet ventilators that work well, but they are all very unsightly, notwithstanding the makers' ingenious attempts to make them appear like everything but what they are, besides being somewhat expensive.

At the risk of bringing forward obvious points, I will again repeat those oft-repeated suggestions. In planning sitting-rooms so arrange the door and fireplace that it is possible to enjoy one's own fireside without feeling an icy thrill every time the door is opened. Again, in planning bedrooms, arrange the windows so that there is a position in the room for the bed, without the sleeper directly facing the light. Apart from the discomfort to a person in health, one only needs to have kept his bed for a time during illness to appreciate this. I am aware that the arrangement is sometimes very difficult to carry out, but as clients often observe, "What do we employ an architect for?" and it is by studying such points as these, that the architect makes or mars his work.

We have become so luxurious in these days that no house, however small, is considered complete without a serving hatch—a convenience, no doubt; but when, as is frequently the case, it is an opening from the kitchen leading directly into the dining-room, it is anything but an unalloyed blessing. Have a small lobby outside, if possible, but, in any event, have double shutters, both fastened from the dining-room side. In the first place, this reduces the annoyance from the smell of cooking, and in the second place prevents the passage of sound; and this in the case of a small house, where the dining has sometimes to answer as a sitting-room also, is important, as it is not always advisable that the conversation in the dining-room should be communicated to the kitchen, or, for that matter, vice versa.

We will now deal with one or two little matters connected with sanitation and water supply.

It has been my lot once or twice to stay at houses where everything has been right up to date—everything that it was possible to think of having been provided. One of these conveniences is a lavatory in every bedroom with hot and cold water laid on, with (and this is particularly appreciated by the maids) waste complete. It certainly is a convenience, but I have always taken care to see that the plug was in the waste before retiring, and I have grave doubts whether, convenient as it may be, a complete lavatory in a bedroom is desirable; that is, of course, as to the waste—the supplies there can be no question about. We all know the corroding properties of soap, how with the best arrangements the wastes are soon thickly coated. Those who paid a visit some years ago with the Architectural Association to the Ophthalmic Hospital, St. George's, will remember Professor McHardy's forcible, if not delicate, testimony as to its qualities. Now it seems to me that if the waste is left unplugged, this must have a deleterious effect upon the air of the room. I should like the opinion of members on this point, as, in fact, upon all the points I have raised.

As we are on the question of wastes, I would point out the necessity of keeping these large where soapy water is dealt with—2 in. at least. For one thing, it is much easier to run a cane down a 2-in. waste than a 1½-in., and I do not think the somewhat larger surface to coat need be considered, as with the large waste, the water passes through much quicker, which more than compensates for any anticipated trouble on that score.

It is comparatively useless to have a large waste pipe if the outlet from the basin is not of similar size; a 2-in. brass plug would, however, be a somewhat formidable thing if (and this does happen) it should be dropped into the basin; some makers supply them of india-rubber or vulcanite, which entirely overcomes this objection, and which work admirably.

The "plunger" bath waste is always, to my mind, unsatisfactory; and if any of you have taken one out, or have seen one taken out, you will, I am sure, agree with me. It is impossible to imagine in what a filthy state it can get in a very short time. How often do we find that the water in the bath lowers when the plunger is down; this, in the majority of cases, arises solely on account of the congealed soap. Nothing in my experience is so effective as the old fashioned plug and chain—unsightly, no doubt; but I would repeat this is to be essentially a practical paper.

Do not on any account omit the safes under the baths, water-closets, and cisterns; have marble under the former if you can run to it; if not have lead. The cost will be more than saved when the first accident happens, and accidents will happen, as most of us know to our cost.

The subject of baths leads us on to that of water heaters. There is not the slightest doubt that a hot-water system is the best, but with the great improvements in gas cooking apparatus (in small houses at least) the gas cooker more often than not, does duty for the kitchener in summer. I am here speaking of houses not large enough to have a special furnace for the hot water. If, then, we are to have a hot bath in the summer, we have either to fall back upon the much-maligned "geyser," or have the kitchener started for this purpose only. My experience with these much-abused articles has been entirely in their favour. I suppose I have had half-a-dozen fixed at one time and the

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other, and every one has been voted a great success by the users; in some cases even where there had been a very strong prejudice against them, owing to the newspaper reports of deaths arising from their use, but in every case as far as I could gather, an improper use. I have, however, never risked fixing one without a vent-pipe. This need not be a great eyesore; it can be of rectangular shape, but care should be taken that it is turned well up into the flue. The later patterns are much improved by the fact, that they are so made, that it is impossible to turn on the gas, without also turning on the water—in fact, they are turned on simultaneously, thus removing a large element of danger. I should like to hear the experience of the members upon this subject also, as the newspaper reports before referred to frequently prevent their adoption, when they would really be a great convenience to the small householder.

While we are dealing with the bathroom, I would point out that the usefulness of that great convenience, the towel-airer (formed by a coil of the hot-water pipes), is much lessened by the almost universal practice of nickel-plating. It was once pointed out to me by a sanitary engineer, but I was rather sceptical, so have tested it more than once, with the result that, in the same system, where the pipes were not plated they have been too hot to touch, whilst those which were so treated could be held without inconvenience. At first I thought that it might arise from the formation of the coil, but my subsequent unvaried experience proved that this was not the case.

As the slop-closet is a thing we cannot often go to the expense of in small houses, and is really not a necessity, try to run to a slop-top to your water-closets. It will save a good deal of slopping about, and the few shillings they cost will be well spent.

Another source of dissatisfaction is the lead-lined pantry-sink. After they have been in use for a little time, the bottoms will be found to have so buckled by the action of the alternately hot and cold water, as to make it impossible to keep them as clean as they should be. The remedy for this is to have them very much thicker than they usually are—12 lbs. at the least; and this is where I think the north country plumbers are so much to the front. I have measured a good deal of their work in the north country towns, and have found that generally it is of a much more substantial character than we are used to in the south. I have seen thick cast lead bottoms used, with a quadrant internal angle of about a 1½-in. radius, which seemed to me as perfect as we could expect a lead bottom to be. I have no doubt the glazed sink will be suggested as a way out of the difficulty, but there is a prejudice with housekeepers against these, owing to the smashing of crockery. Where they have been adopted a wood grid is sometimes placed in the bottom, and if this was kept out when not in use and properly cleaned, would meet this objection; but as a rule it is by no means kept as it should be, and moreover has a most awkward habit of floating on the top of the water. Taking everything into consideration, I am afraid we must stick to lead, with all its faults.

We are so patriotic, that we are inclined to think that oak answers every purpose where a hard wood is required. Now I have seen, and I have no doubt that you have, draining-boards made of this wood, warped and split in every direction. My experience is that there is nothing to compare with sycamore for this purpose, for besides looking clean, owing to its light colour (and this is a consideration), the grain is so much closer than oak, that it is more easily kept so.

When specifying the cistern, do not use the words "to be fixed where will be directed," the usual result that it is placed in a position practically inaccessible to everything but frost. I speak feelingly, as in my own case the cistern is placed in the roof, and the only access to it is through an opening in the wall of the bathroom, 1 ft. 5 in. wide and 1 ft. 11 in. high, the sill of which is 4 ft. off the floor. I was rather surprised to find that I could squeeze through an opening of these dimensions, but squeezing through is a small part of the trouble. Just inside, a valley crosses the opening, and about a foot farther in the exhaust from the hot-water service runs horizontally about 18 in. off the floor, so that it is a case of ducking under the valley, and over the steam pipe; at great risk to yourself in the one case, and to the steam pipe in the other. And, of course, the ceiling joists are innocent of anything in the shape of boarding. With a little forethought this could have been entirely avoided; but although the example given is an extreme one, I have met with many others very little better. When in planning a house, the position of the cistern is considered at the outset, it will be found a by no means difficult problem to arrange for easy access, and frequently off the level of the floor. This is important, as in the case of any of those little failures which will occur, notwithstanding all precautions, the trouble can frequently be stopped without waiting to send for a plumber or, in fact, any member of the male persuasion, which will be absolutely necessary in the case of the usual arrangement of a trap-door and break-neck ladder, which is seldom in position when wanted. Provide also a small quantity of rough flooring round the cistern, and from the entrance to the cistern space, or, what is better still, have the whole space floored. If you cannot go to the cost of boarding and felt throughout the whole of the roofs, squeeze out a little for the cistern space, and on no account omit the cistern cover.

The question of frost brings one to troubles caused by the pipes bursting. A very effectual way to prevent this is to run the cold-water pipes near to the hot-water pipes (but not near enough, as I have seen them sometimes placed in an attempt to remedy the evil) to preclude the possibility of getting any really cold water when required.

Do not be sparing with your stop-cocks; a pound or two spent upon these will be one of the best investments you can make. If possible have one in every separate service: those in the services from the cisterns as close to it as possible, and in the branch services in the same relative positions to the main services. It is then easy to turn the water off from any part in the case of necessity of repair or of burst pipes, a convenience much appreciated by everybody concerned, frequently preventing damage to the house and furniture, besides facilitating repairs and the consequent saving of cost.

Another great convenience where there is a constant supply, is an arrangement whereby the cistern can be emptied, and yet a supply of water obtained off the main. This can be achieved by means of two stop-cocks with a draw-off between. I once had the particulars sent me of a combination fitting of the three in one, which struck me as being a practical solution of the difficulty. I should be glad to hear if any member has had an opportunity of seeing this in practical use.

As it is by no means an easy matter for the uninitiated to trace the water-pipes, or to see clearly to which service the stop-cocks belong, I would urge another little investment, which I have known to save endless trouble. Have all your stopcocks labelled. Small enamelled iron labels can be easily bought, or, failing this, parchment ones (as used for luggage) make a fair substitute, if the pipes are concealed in a casing. In the latter case have portions of the casing hinged over the stop-cocks.

If possible arrange for a draw-off on each floor; much labour and damage to carpets, &c., is saved by this; only take care that you have a large waste to the trough under, or the remedy is worse than the disease.

Try to arrange the water-closets, so that it is not obvious that a person is either going to, or returning from, this particular spot. There is a good deal of sarcasm expended over what is termed the mock-modesty of the English, but I for one should be very sorry to see the barrier entirely broken down. A very simple way out of the difficulty is to arrange for the bathroom with a lavatory in it to open from the same lobby, a short passage connecting this lobby with the main hall or landing. It, moreover, has the advantage of bringing the service pipes together. Do not consider that a water-closet on the first-floor is sufficient for any but the very smallest house. When those little social entertainments, which are so dear to every hospitable householder, are given, many painful and embarrassing situations will be saved by the little extravagance of an additional water-closet.

A really silent acting waste-preventer is, I suppose, not possible. There are, I know, so-called silent ones, but the silence comes too late, besides which the noisest period of their working is unaffected.

In the hot water services take care to have the flow and return pipes of large size, not less than 1½ in., and do not be sparing in the length of the flows and returns. Run them as near as possible to the points required, so that the lengths of single services are as short as possible. Nothing is more irritating than to have to draw off a large quantity of cold water before getting a supply of hot. Never omit the bib-cock for emptying the hot water system, nor the stop-cock in the cold water supply; but for safety have these with loose keys, so that they cannot be tampered with.

A small matter, but one which is so small as to be sometimes overlooked: if it is necessary to run any pipes in the thickness of the floors, see that the boards over are fixed with brass screws and cups, so that any portion of the pipes may be easily accessible without damaging the floor. We all know what the jobbing plumber or gasfitter is capable of when dealing with floors.

It is surprising how few staircases appear to have been thought out; not in the artistic sense, but the practical. It often seems to me that a certain space is portioned out for the stairs, and they have to be got in somehow. At least, that is how they often appear to me. Doubtless the staircase *is* a nuisance, but as it occurs in every house, an effort should be made to make the going as perfect as can be. Winders, we know, are a painful necessity frequently, but a good many years ago an old clerk of works gave me a rule which I have seen worked numerous times since with success; it may be generally known; if so, pray pardon the repetition—that is, to make the width of the winder at 18 in. from the newel end, the same width as the tread. The going will then be found continuous from flyers to winders and *vice versâ*.

Now for the only item which in any way approaches the artistic, and my excuse must be the same as on that other historical occasion—it is only a little one. I have often felt how extremely unhappy the papering or other wall decoration finishes around an archway, the jambs and soffit being in cement and finished with a moulded edge. Sometimes papering the bead or moulding is tried, and a terrible botch it is. Sometimes the paper is cut close up to the moulding, but this never looks satisfactory. A very simple method of overcoming the difficulty is to run a narrow fillet in the cement on the *face* of the wall for the paper to stop against. It need not be more than ⅛ in. projection and ½ in. wide; it therefore adds very little to the expense. It may be that this has been adopted more than I am aware of, but in my experience in not one out of ten instances has any attempt been made to get over the difficulty.

I suppose there is no limit to the subject I have chosen, but I think I have dealt with enough for one evening.

I believe I can claim to have kept the promises I made at the commencement. I have taken you all over the house from top to bottom, and in most of the corners. I have avoided being artistic except my last little lapse, for which I crave pardon; and I do not think I have mentioned many things that you are likely now to have heard for the first time. Perhaps, after all "Reminders" would have been a fairer title.

Believe me, I have not taken up this subject in a carping or cavilling spirit. All the points I have mentioned have been brought to my notice, and the majority of them by clients, some of whom, I must confess, *were* cavillers, and would grumble at anything. They seem to look upon the surveyor as a sort of whipping boy to the architect. Whether it is the architect's greater dignity protects him from the direct assault, I know not; but the probability is they look upon the surveyor prowling around in all the rooms and corners as a nuisance, especially as he is generally on the premises for a longer time at a stretch, when the house is in occupation, than the architect ever is, and they endeavour by this means to get even with him.

Nobody appreciates the artistic side of architecture more than your humble servant, but at the same time he must confess with sorrow, that the practical is often sacrificed to the artistic, or at least the decorative. If you have means for both, well and good, but do not forget that a house is primarily to *live in*. After looking to this, then do all you can to make it a thing of beauty. If you have not money for embellishment, then rely upon a chaste simplicity and good proportion, which are after all the true test of an architect's capabilities. I am speaking now to the artistic architect proper, the man who knows how to embellish

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a building, not to the freak architect, the man who by every shilling he spends in embellishment makes his building more and more hopeless.

Finally.—Remember that it is the little things which add to the convenient working of the household that appeal to the lady portion of the client, long after the craze for those tricky little points of design have palled, and (this should be a whisper to any body but a professional one) I have heard that ladies have tongues; and you may rely upon it, that the lady who is satisfied with the internal domestic arrangements of her house, and has a pride in showing her lady friends around, is likely to do the architect more service in procuring him future clients, than the one who practically has to admit that the outside, after all, is the best side.

THE SURVEYORS' INSTITUTION:

PRESIDENT'S ADDRESS.

THE opening meeting of session 1901-2 of this Institution was held on Monday evening at No. 12, Great George-street, Westminster, Sir John Rolleston, M.P., the President, in the chair.

The minutes of last meeting having been read and confirmed,

Mr. J. W. Penfold, hon. secretary, announced a large number of gifts to the library, including a very handsome bequest from the late Mr. Arthur Cates, consisting of 127 works, some of which were of considerable value. These and other books were left to Mrs. Cates with instructions that they were to be given subsequently to the Institution, the Institute of Architects, and others bodies, but Mrs. Cates had given the books at once, and in the circumstances he proposed that a special vote of thanks be given to her.

The vote of thanks having been cordially agreed to, as well as a vote of thanks to the other donors,

The President delivered his annual address, the greater part of which was devoted to an interesting but desponding review of the state of the agricultural industry of the country, and to a consideration of the Agricultural Rating Act of 1896. In his opinion, towns were sponging upon the country by the way people and industries removed, in order to avoid the heavier rates of the towns, to places where parochial expenses were paid in a preponderating proportion by the occupiers of the land. A still further invasion was contemplated by the provision of cheap transit, which was to transport the people of the town into the country to live. While not objecting in any way to this (indeed, he thought it desirable to relieve the overcrowded populations of the large cities), it was surely right that the farmer should be secured in some way against the expenses caused by these incursionists, and the half-rates remitted on land were even an insufficient compensation for the inequality in rating to which he was subjected, and farms in the neighbourhood of dense populations had an especial claim for this remission. He could only hope that in the measure dealing with the general question which was promised the permanent relief of the taxation of agricultural land might occupy the most prominent and important place. Of all the products of land, the only one the value of which appears to be in the ascending scale is timber. In the Midland counties he had been furnished with accounts of timber sales at which single oak trees had realised up to 100*l.*, while other woods were commanding good prices, and poles and thinnings were readily sold. There was a reason for this. The great onslaught that had been made on the virgin forests of the world, from the time of the Phœnicians onwards, without artificial reafforestation, must at length be appreciably felt. The increase of population and the advance of civilisation must also point to an increased use of timber of all kinds for works of construction, for articles of use and ornamentation, and for fuel. A rise in the value of home-grown timber seemed possible; in any case, a ready sale might be anticipated. With the decline in the value of cereals, it could hardly be doubted that a considerable portion of the land of this country (some of which was derelict, and some let at a very low rental) might be planted to advantage. Apart, too, from the planting on a large scale, and in champaign and not woodland countries, much timber might be secured by a careful conservation of such saplings as were the weeds of the locality, and which might be found in abundance in every hedgerow. According to his experience, a hedgerow tree could not be planted to advantage, while the self-sown sapling would flourish. The hedge-cutter was mostly a ruthless destroyer of these, and he could only respectfully suggest to the young members of the profession who had the care of landed estates that a careful supervision of the hedgerows, in view of a future crop of timber, was desirable. An understanding with the tenant might easily be arrived at, and the denudation of the country-side which was so marked in some parts might be prevented, and a future crop of timber, affording shade, shelter, beauty, and profit, might be secured. The study of the science of forestry, for which special opportunities were afforded at that Institution, he would commend also to their careful attention.

The growth of population had its drawbacks as well as its advantages. One of these was the pollution of streams by sewage from dwellings and farmsteads, and it might well be suggested that impure water imbibed by cattle might have an injurious effect, not only upon the animals themselves, but also on human beings who consumed milk or meat. The representative councils of the counties were alive to this growing evil, but the expense of proper sewerage systems in rural parishes still favoured its continuance. With regard to the future treatment of sewage, he might say that there was no prospect of any cheaper processes being adopted than those in vogue, and that those who were intent upon dealing seriously with this question must make up their minds to the expenditure of money. The best, safest, and most efficient system known to-day was the preliminary treatment of sewage by one or other of the bacterial methods, with final purification of the effluent from the tanks or beds on land. In this case the bacterially clarified sewage was in a better condition for application to land than when applied in a crude state. It might, he thought, be taken for granted that the treatment of crude sewage on land was a system no longer in favour. The chemical treatment, too, except in some few cases where the sewage was highly charged with trade liquids, might be said to have been generally abandoned. The bacterial treatment had apparently made such progress that the sewage of any town might be dealt with even at no great distance from population, without final application to land should this not be available, but in his opinion the best system to-day was a combination of bacterial and land treatment.

Proceeding, the President said: The nationalisation of the land will never appeal to surveyors as an object worthy of accomplishment, but the nationalisation of water may commend itself more to their consideration. An ample supply of pure water is essential to the well-being of the people and to the trade of this country. While inroads are made on available supplies the quality is generally deteriorated as population and cultivation increases. The sources from which pure water, therefore, may be obtained get rarer. However ample in quantity, the water from inhabited areas appears to be undesirable. Water, however good, is defiled by population, and the pollution of water is productive of some of the most terrible diseases to which the human body is subject, as has been demonstrated recently in the borough of Maidstone. To the hills, therefore, it seems we must look for our great future supplies, but these great upland areas are getting scarce, at least in reasonable propinquity to the great cities, and as these are becoming alive to the requirements of their people, something like a scramble arises for such as are suitable, and attempts are made to peg out claims and even to jump the claims of others in order to acquire these. But the need for pure water is as great in the country as in the town, in smaller places as in the great cities; but the expense of the supply is mainly prohibitive to the lesser community. It seems to me, therefore, that, subject to the claims of private owners to the collecting grounds, the water from the sky should be as free as the water of the sea, and that some scheme might in the future be adopted to secure these areas on behalf of the State, and that the cost and the carriage of the water might be the subject of national taxation, as without a generally good supply throughout the country the dangers of disease and death will approach proportionately nearer as population increases. Some of our great cities, in order to secure the purity of water, are already purchasing these collecting grounds as well as the sites of the reservoirs, and this is a use to which land may most properly be applied. If no longer required to supply the people of this country with food, large areas may well be devoted to supplying them with water, the importation of which does not appear to have been at present suggested. If, however, the acquisition of large areas surrounding reservoirs becomes the fashion, there will be many more sources available than there are at present, inasmuch as the population and the cultivation on these areas can be dispensed with, and thus many sources now not available will be rendered suitable. . . .

The commercial prosperity of the country, the great amount of construction that is going on, has doubtless created an unusual demand for able bodied labourers such as the rural districts supply, and better pay and shorter hours have proved an attraction. In the matter of pay we can only regret that the farmer cannot compete with the wages paid by contractors and mine-owners. If he could, he would, in my opinion, keep the labourer on the land; but there is another drawback to certain kinds of rural labour, and that is continuous work for seven days of the week. Live stock must be cared for and cows must be milked on Sundays as well as on other days, so that I think it is not to be wondered at that there is a growing objection to work of this kind when the workman elsewhere is usually able to witness a football match on Saturday afternoon and to lie off on Sunday, probably with as much or more wages in his pocket. It seems hard to suggest a relief man for Sundays to the farmer or dairyman who can hardly make ends meet as it is, but it seems to me that to keep the labourer on the farm is a matter of money and money only. I am not a believer in the attractions of the town. Other things being equal, the country-bred man is usually averse to town life, and he is, as a rule, more comfortably housed in the country, especially where he has a garden to his cottage or an allotment, and if prosperity were to return to agriculture there would in my opinion be no difficulty in keeping the labourer on the land.

With regard to the housing in towns, I must remark on the general failure of municipal enterprise in that direction. No provision is ever made for the very poor. It is always the aristocracy of the working classes, those who are thoroughly able-bodied, earning good wages, and who can pay good rents, that are catered for. But it is those men who are born in a degree incapable or weak, the poor spinsters and widows who work in garrets, who receive no attention; and in my view, until municipalities provide for this class, who have the greater need, their efforts will still be attended with failure. If the public are to provide house accommodation for the poor, those who represent the public had better consider the construction of houses which can be let at a shilling a room the week, and which contain very few rooms. In my own experience where areas of this class of houses are taken down by railway companies or corporations, they are never replaced, but instead houses of six rooms at least are built, which do not rehouse the displaced population, who have to resort again to the overcrowded areas wherever they can be found, and which consequently become more crowded still. The very poor, who are always overlooked, have in my opinion the greater claim for consideration when house accommodation is provided at the public cost, and to provide for this class should in my opinion be the aim of the public bodies of this country. . . .

A matter of considerable difficulty and perplexity to surveyors is the law, or rather the absence of law, with regard to ancient lights, and I hope that the joint recommendations of our Institution and of the Royal Institute of British Architects, or something based on them, may before long blossom into an Act of Parliament. With the great amount of rebuilding and construction on a larger and more handsome scale that is now going on in our great towns, disputes as to lights are frequent and harassing. The instability of law founded on nothing more definite than varying, or apparently varying and conflicting, judgments in the Law Courts, is manifest. An excellent paper on this subject was read by one of our members at our meeting at Southampton last spring, and I observe the reference in it to a

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Leicester case (Warren *v.* Brown), decided by Mr. Justice Wright in 1900, which even as I write is awaiting judgment by the Court of Appeal.* Mr. Justice Wright expressed it as strange that the question should still be open to discussion as to whether the right of light that is acquired by statutory prescription is a right to a continuance of substantially the whole quantity of light which has come to the windows during the twenty years, or is limited to a sufficient quantity of light for all ordinary purposes. His lordship, who was both judge and jury in the case, obviously took the latter view, for after having found (1) that though there was no material obstruction or diminution of light to the upper windows of the factory, to the windows on the ground floor the defendant had materially diminished the light which the plaintiffs had enjoyed for those windows for the past twenty years, but that abundant light remained for all ordinary purposes of inhabitancy or business; (2) that the inconvenience to which the tenant was subjected could be, and to a great extent it had been, obviated by the removal of machines to the upper room, and in any case it could be remedied by some increased expenditure for gas; (3) that if the plaintiffs should be entitled to damages the amount should be 100*l.* for the tenant and 200*l.* for the owner, his lordship held that the plaintiff had no cause of action, and gave judgment for the defendant. With very great respect to this capable and learned judge, I venture to express the opinion that he has set the defendant a very formidable task to defend and uphold his judgment. The legal profession and our own will alike, no doubt, await with curiosity and anxiety, and will read with real interest the considered judgment of the Court of Appeal. If that Court speaks with more definiteness than it has ever done before as to the angle that should, as a general rule, be regarded as sufficiently protecting those who have acquired by statute easements of light, Mr. Justice Wright will, even if he should be overruled, have rendered valuable service to the building enterprise in our large commercial centres.

One subject which, as an inhabitant of this metropolis for the greater part of the year, seems to be of growing importance, is the great increase of street traffic, and well worthy of consideration are the various sehemes put forward for its relief. The widening of streets on a large scale seems to be a project too ambitious to suit the pockets of the ratepayers, inasmuch as compensation for trade disturbance must amount to an enormous sum in addition to the cost of the land and buildings. Widening, however, is only one way of relieving traffic. It cannot be necessary that all the vehicular and pedestrian traffic should be conducted on one level. Streets or causeways may be deepened or heightened, and in my view certain schemes put forward by Sir Frederick Bramwell, Sir John Wolfe Barry, Mr. Emden, and others in this direction are most worthy of the consideration of the public. Again, the expansion of commerce and the general growth of population causes this increase of street traffic to be experienced in all our great cities, and the question of the material most suited to bear that traffic is a question of great interest to the whole country, and is likely to engage the attention of surveyors the world over. . . .

Gentlemen, the present is the age of association. . . . . From small beginnings our association has blossomed into one of the most important institutions of this country, representing vast and varied interests. When we consider that almost the whole of the land and buildings, the mines, the quarries, the forests, and very largely the interests of the great municipal and industrial corporations of the United Kingdom are represented by our Institution, we must, I think, conclude that the collective weight of the opinion of our members on matters affecting these interests must have due weight even in the Councils of the State. With the growth of our collective importance, therefore, our individual responsibilities must proportionately increase. With the advance in the position of our Institution, the status of those who comprise it must correspondingly advance, and they in turn will recognise that the interests of the Institution and the welfare of its members are under their care and in their keeping. . . . .

Mr. A. Vernon proposed a hearty vote of thanks to the President for his address. Many of the subjects considered, the President had treated with impartiality. The only view to which he would take exception was the gloomy view the President entertained as to the agricultural prospects of the country. Throughout the whole world there were bitter complaints as to the agricultural industry, and in this country we were suffering as other countries were. He hoped that things had been better in recent years.

Mr. A. Buck seconded the vote of thanks. One subject of considerable importance which the President had dealt with was the migration of the rural population to the towns. One means of getting the population to stay on the land was to get the landlords to improve tenements, for it was the bad condition of the dwellings of farm labourers that drove the young men to the towns.

The vote of thanks being heartily agreed to, The President briefly replied.

The next meeting will be held on the 25th inst., when a paper will be read by Mr. Dudley Clarke on "Local Taxation."

* The decision of the Court of Appeal is reporte on another page of our issue this week.—Ed.

Illustrations.

VICTORIA MEMORIAL COMPETITION.

WE give this week the general perspective view and the plan of Mr. T. G. Jackson's design for the Victoria Memorial, and the elevation of his triumphal entrance arch to the processional road. We give also the perspective view of Dr. Rowand Anderson's triumphal arch for the same situation in his scheme; a design which, as we have already observed, is much the best feature in his scheme, and its picturesque Renaissance treatment affords an interesting and effective contrast to the more Roman severity of Mr. Jackson's arch.

The following extracts from the Report submitted by Mr. Jackson with his design will best explain his views in regard to the treatment of the problem :—

"I have assumed that the Mall in any case be replanted on the lines shown in the official plan, but in other respects I have availed myself of the liberty allowed to the competitors to depart from the arrangement there laid down.

The Square at the West end.—At the west end of the Mall in front of the Palace I form a regular square or 'place' enclosed by colonnades, and partly occupied by gardens. It seems essential to the dignity of the scheme that this part should be laid on formal lines, having relation to the façade of the Palace and the straight avenue of the Mall beyond. I have also thought it important, so far as it can be done without inconvenience, to divert all public carriage traffic from this area. The cross road from north to south in front of the Palace must of course remain, but I make the two public carriage roads which run east and west to pass entirely *outside* of the colonnades which would screen the enclosed space from dust and noise, allow the monuments it contains to be enjoyed by the public without interruption, and so add materially to the quiet of the Palace itself.

It will be seen from my plan that this makes the line of road by Constitution Hill considerably more direct than at present, and provides a second carriage road on the other side.

The enclosed square is shut off from the Mall by a screen of piers, railings and gates, which excludes public wheel traffic, but gives foot passengers free access to the gardens and enclosure. Gates, however, at each end of the screen would be opened for carriages going to the Palace at receptions, and the Royal gate in the middle for the King when going in State to Westminster.

The Queen's monument would occupy the centre of the square, right and left of it I have placed a fountain of bronze in a basin of stone, and round it are groups of statuary representing the principal Colonies and Dependencies of the Empire. The area would be gay with flowers and shrubs in grass plots, and the colonnades would afford shelter and shade, and would be admirably suited for spectators at State processions, for whom the flat roof would also be available.

The back wall of the colonnades affords space for inscriptions and national memorials in sculptured relief to be added from time to time, for which there is at present no such place available in London.

The four pavilions at the angles would bear the Royal arms and cypher, and be adorned with bronze figures representing arts and industries.

The central part of the square is left open to afford space for carriages at State receptions.

The Mall.—The Mall, planted as proposed by the official plan to which I have adhered, forms three avenues. The two outer are public carriage roads, the middle one, besides a 40-ft. road in the middle, has a wide grass plot on each side, affording space for the contemplated avenue of statues. The central avenue would be open to the public by day, but I propose to enclose it by railings, with gates to be locked at night for protection of the statues, a precaution which experience both at London and Berlin proves to be a necessity.

On State occasions the King would drive down this central avenue, but otherwise it would never be used by carriages.

The Arch.—At the east end is the great arches through which the Royal carriages would pass on State occasions. It seems better to place this at the entrance to the Mall proper than at the spot marked on the official plan. Eastwards of the spot where I have placed it, the Mall expands into several diverging thoroughfares, and its continuity is lost; and the arch would seem to lose its meaning unless it admitted specially and directly to the road leading to the Palace. The effect of it also in combination with the steps leading to the Duke of York's column would, I think, be very good. The exact position of the arch, however, is not material.

In its design I have aimed mainly at simplicity and dignity, avoiding ornament, except of the highest kind, and emphasising mass and proportion. In either of the positions suggested it will have to compete with the high buildings of Carlton House-terrace, and it must be on a grand scale or it will be dwarfed by its surroundings. The Marble arch, which is only 42 ft. 8 in. high, or the Wellington arch, which is 62 ft. high, would in this case look quite insignificant. I have made my archway 60 ft. high and 30 ft. wide; the height to the top of the cornice of the main order 79 ft., to the top of the attic 93 ft., and to the top of the sculpture which crowns it 120 ft. The area of the structure is 68 ft. by 34 ft., and besides the simple colonnade which carries the vault, the only positive ornamental details are a bronze frieze of life-size figures representing the Jubilee processions of 1887 and 1897.

General Scheme.—The whole scheme, beginning with a stately arch, continuing with avenues of trees and statues along the Mall, and reaching a climax in the colonnades and gardens of the new Palace square at the west end, would, I venture to hope, be a not unworthy expression of the nation's grateful remembrance of her Queen, and it would, I think, compare favourably with anything of the kind to be found in other European capitals.

In conclusion, it may be observed that the whole scheme is divisible into parts. The arch is quite distinct from the rest, and the statues in the Mall would, of course, be added one by one as occasion arose and means were found.

As no estimates were asked for, I have made the best design I could without considering expense, but I do not think any part of it is unduly costly. The most expensive feature would be the sculpture, of which, as I have said, the greater part can be carried out piecemeal.

The material I proposed generally for the masonry is hard Portland stone, which is not only the most durable and best able to resist this climate, but is also the most beautiful material for London use, bleaching, as it does, with exposure to a more than marble-like brilliancy."

We may add that while we considered Mr. Webb's design was rightly selected on account of its admirable and truly architectural plan, more especially in regard to the method of connexion with Charing Cross at the east end, we cannot but express the greatest admiration for Mr. Jackson's design, more especially his treatment of the ornamental *place* in front of the palace, which internally would have made a beautiful piece of work, although externally there is an architectural defect, to our eyes, in the fact that the rectangular lines of the screen contrast unpleasantly with the curved lines of the roadway, and this interferes with the architectural unity of the scheme.

ROOD SCREEN, ST. DENYS', SLEAFORD.

THIS screen, which is one of the finest in Lincolnshire, is referred to by A. W. Pugin in his treatise on "Rood Screens," being particularised with eight others as amongst the most remarkable in England. Dr. Mansel Sympson, in his admirable and exhaustive paper on "Lincolnshire Rood Screens and Rood Lofts," read at the 1890 meeting of the Lincoln and Nottingham Architectural Society at Holbeach, repeatedly refers to it. "The splendid example at Sleaford I should feel inclined to date the close of the fourteenth century, about the same time as the stalls at Lincoln from the similarity of the tabernacle work, which is very evident on comparing the pulpitum at Lincoln with that at Sleaford. The stalls at Lincoln are dated at about 1380, which would suit the work at Sleaford very well, as there are traces of Perpendicular feeling in the transom, which is inclined at an angle of 45 deg. in the two outer bays." (Architectural Society's Report, 1890, p. 199.)

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It is, however, probable that the screen is a little later than this. The date of nave and chancel arch may be taken as Decorated at about 1380, and there are evident traces on the north jamb of the chancel arch of a previous screen of a different and flatter curve of groined canopy at a lower level; the plug holes for the woodwork still remain. This was destroyed by fire, the springing from north jamb of chancel arch and the respond of north arcade having been calcined to the sill of the clear-story windows. The level of the original screen was higher than its successor, as may be gathered from the insertion of stone in the old beam holes, and the fact, as shown, that there are two steps from the sill of the upper doors to staircase to the level of the "florthe wch remayneth."

From Peacock's "Church Furniture" we learn that the rood loft was taken down in 1566. "Itm.: the rode lofte taken downe all save the florthe, wch remayneth standing, wch we cannot take doune, for yt is a waie frome one house to another, so yt we have noe passage but that waie to ytt;" and probably then the panelling to the front was taken down and the groined canopy at the west removed. Still much remains that is very beautiful.

The drawing will explain itself. It is curious that although there are two staircases to the rood loft, a third was added some forty years after the nave was built, and contains two of the three windows engraved by Sharpe in his "Decorated Windows" (1849).

The screen was faithfully restored in 1833, and then the doors to the centre opening, which enclosed the chancel (as shown on a sketch in possession of Mr. E. Yerburgh, dated 1830), were removed.

It is regrettable that the lower doorways were then blocked by two monuments to Robert Carre (1590) on the north, and Sir Edward Carre and his wife (1680) on south.

The screen is one only of the many objects of interest to the architect and ecclesiologist in this church, which is situated in a district singularly rich in church architecture.

H. K.

THE NEW GOVERNMENT OFFICES.

THE following short and trenchant leading article appeared in the *Times* of Tuesday:—

"Mr. Akers-Douglas is a bold man. He is not afraid, in spite of abundant warnings, to set himself in open opposition, not only to the educated public, but to the strongly expressed convictions and wishes of the architectural profession. He has obstinately adhered to the unfortunate policy upon which, after the lamented death of Mr. Brydon, the Office of Works embarked with regard to the new Public Offices at Westminster. It will be remembered that the late Mr. Brydon was appointed to design this important block of buildings, which are to occupy the magnificent site on the west side of Parliament-street, and that after making his plans and elevations the architect died. These plans and elevations were, of course, subject to revision; and, moreover, the detailed drawings were not made. Obviously, then, the proper course was for the Office of Works to call in the best available architect of a talent akin to Mr. Brydon's and to ask him to finish the details in the spirit of Brydon's work, and generally to bring the building to its completion in as close accord as possible with the original intention. But the Office of Works preferred a more domestic and possibly cheaper method. It has a staff of architectural clerks of its own; why not hand the job over to them? The intention so to do was announced; and immediately protests were made by Mr. Leonard Stokes (Mr. Brydon's executor), Professor Aitchison, and other architects, and by many other persons who urged that nothing should be done to jeopardise the success of what promised to be a really fine building. In this sense we have twice given expression to what we believe to be the absolutely unanimous opinion of competent and impartial people. In reply, the First Commissioner put out first an extremely feeble defence of his proceedings; and, secondly, an advertisement in the trade journals asking for builders' tenders. The time for these tenders to be sent in expires to-day. The unrepentant First Commissioner has had his way, and all that now remains for him is to accept one or other of the tenders, to proceed to carry out the clerk-completed version of Brydon's design, and to trust to the ignorance of his countrymen and to the chance that the British voter will not detect the difference between work that is finished and work that is botched. Probably for the next big undertaking he will not think it worth while to employ an architect at all. Why should he? An office which can finish ought surely to be able to begin. Why trouble about professional opinion, the Royal Academy, the Institute of Architects, or any of 'those who know'? We are only surprised that Mr. Akers-Douglas should have gone outside his office for the Queen Victoria Memorial. If he can carry out the Parliament-street block, why apply to any one else to reorganise the Mall or even to set up her Majesty's statue?"

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting of this Institute on the 6th inst., Sir Henry H. Howorth, President, in the chair, Mr. C. A. Bradford read a paper on a Millom Vesica Piscis window of unusual character at Millom Church, Cumberland, which he illustrated with a number of photographs and drawings. In sketching the history of the term *vesica piscis* (fish-bladder), he pointed out the difficulty of discovering the relationship between the name itself and the thing signified by it, the latter indicating a regular geometrical figure of elegant and balanced form, the former a natural object of unsymmetrical and inartistic appearance. The term was apparently first met with in the works of Albert Dürer, and introduced into the vocabulary of English antiquaries at the beginning of the nineteenth century, perhaps by Hawkins in 1813. The origin of the form itself was probably to be found in nature—in the leaves of the forest or the human eye. Translated from nature to art, it found a place in decorative art at a very early period, and spreading from the east to the west was soon employed everywhere—in Early Christian MSS., in paintings and frescoes, in painted glass, tiles, objects of devotion, and ecclesiastical vestments. Examples in sculpture were numerous in both England and France, in tympana of doorways, on capitals, on altar frontals and tombs. To-day there were at least three kinds of window to which the term "fish" was applied, namely, to that of the pointedly-elliptical outline; to that filled with tracery of a peculiar character described by German archæologists; and to that generally known as the spherical triangle. Mr. Ruskin had pointed out the beauty and suitability of the *vesica piscis* form for gable windows in his description of the example at Dunblane Cathedral; and many instances of its occurrence, placed either vertically or horizontally, in England and Scotland were enumerated, notably that at Ashford Carbonell in Shropshire. The use of the *vesica piscis* as an elemental form in the development of Gothic window tracery had been carefully worked out by Freeman. The window at Millom was remarkable (1) for its large size, measuring 10 ft. 4 in. by 7 ft., and occupying the entire west end of the south aisle of the church; and (2) for its being filled with tracery. There was no documentary evidence of the fabric of the church, but the date of the window appeared to be about 1330, which would probably fix it as the work of Sir John Hudleston, who obtained a licence from Edward III. for the fortification of the adjoining castle.—In the discussion that followed, Mr. C. R. Peers, Rev. T. Anden, Mr. E. Green, Mr. P. M. Johnston, and Judge Baylis took part. Mr. R. L. Hobson then contributed a paper on "Mediæval Pottery found in England." After a few remarks on the quality of mediæval pottery and the difficulty of arranging specimens in chronological order, Mr. Hobson went on to review the existing evidence of date, and to try and formulate the characteristics of the various periods. The constitution of the Abbey of Evesham (A.D. 1214) furnished the earliest reference to earthenware in contemporary writings. Manuscript illuminations were next considered, the most remarkable being a picture in the "Loutrel Psalter" (early fourteenth century) of a rustic breaking a pitcher over another rustic's head. This is the earliest instance in which pottery is clearly indicated in a mediæval MS. Mr. Jewitt's verdict on the Burley Hill find was criticised to clear the way for the statement that no specimen found in this country has been proved to be of Norman date, though it is extremely probable that such specimens exist unrecognised. Lantern slides, showing in all about fifty objects, were shown in two series—documentary pieces, ranging from the late twelfth to the sixteenth century, and a miscellaneous exhibition, including a number of costrils, some fragments of so-called Cistercian ware, pieces illustrating the various forms and ornaments in use, and a number of vessels of grotesque shape.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The first meeting of the Session 1901-2 was held at 32, Sackville-street, Piccadilly, on November 6, Dr. W. de Gray Birch, V.P., in the chair. Mr. C. H. Compton exhibited two copies of Court Rolls of the Manor of Stoke Newington. One dated May 18, 13 George I., A.D. 1727, being an admission of Maria Lascells to a messuage, is in Latin, which ends *Fecitque fidelitatem* (and made fealty). The other is dated July 9, 1740, and is an admission of Mary Ingram to a moiety of certain hereditaments held of the same manor, is in English, and ends "but her fealty was respited." This is the usual form in copyhold admissions since that date. Mr. Compton also read a paper on "The President and Council of the North," an institution created in the twenty-eighth year of Henry VIII. for the government of the northern counties of England during and after the rebellions consequent upon the dissolution of the lesser monasteries. Some further relics from the crannog at Dumbuck were exhibited by the Rev. H. J. D. Astley, and were commented upon by the chairman, Mr. Gould, and Mr. John Bruce, who mentioned that his excavations at Langbank, resulting in the discovery of a crannog upon the south side of the Clyde, as already reported, were suspended until the spring, but in due course a report of the operations and the results would be presented to the Glasgow Archæological Society.

THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Chelsea Borough Council 13,500*l.* for purchase of artisans' dwellings; Bethnal Green Borough Council 9,760*l.* for baths and wash-houses; Camberwell Guardians 50,000*l.* for extension of infirmary; and Greenwich Guardians 6,000*l.* for fittings and fixtures for schools.

Acquisition of Southfields, Fulham.—The following recommendation of the Parks and Open Spaces Committee was agreed to after discussion:—

"That the estimate of 30,000*l.* submitted by the Finance Committee be approved; and that the Council do agree to contribute three-fourths of the cost of the proposed acquisition and laying-out by the Council of the Metropolitan Borough of Fulham of the land at Southfields, Fulham, about twenty-two acres in extent, for the purposes of a public open space, such contribution not to exceed 30,000*l.*, and to be made upon the condition that the Council of the Metropolitan Borough of Fulham undertakes to maintain the ground as a public open space, and to complete the work of laying out within a period of two years from November 5, 1901. . . ."

Street Improvements.—The following recommendation of the Improvements Committee was also agreed to:—

"That, subject to the Councils of the Metropolitan Boroughs of Lambeth and Camberwell giving their consent to the proposed tramway from Camberwell-green to Lordship-lane near Crystal Palace-road, and agreeing to contribute between them one-third of the net cost of the necessary street widenings, and subject also to one-third of the net cost of the street widenings being charged to the account of the improvement, the remaining third being charged to the tramways account, which will also be charged with the whole cost of laying down and paving the tramway track, application be made to Parliament in the Session of 1902 for powers to widen Denmark-hill, Champion-park, Grove-lane, Dog-Kennel-hill, Grove-vale, and Lordship-lane, in general accordance with the plan approved by the Improvements Committee on October 30, 1901."

Subways for Gas and other Pipes, and Tramways.—The Highways Committee recommended, and it was agreed:—

"That the Council do apply, in the next Session of Parliament, (1) for powers to make subways in streets for the reception of pipes, wires, and other things, where desirable, and for electrical traction and other purposes of locomotion; and (2) powers to construct a subway and to construct tramways therein for electrical traction from the Victoria-embankment, along Wellington-street, across the Strand, through the new street thence to Holborn,

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under Holborn and Southampton-row, and to take such tramways, by an inclined plane, to the tramways terminus in Theobald's-road, or to the tramways authorised to be constructed in Rosebery-avenue, as may be considered most expedient."

Tramways—On the recommendation of the same Committee, the following was agreed to :—

"That application be made in the next Session of Parliament for powers to enable the Council to construct tramways, for an underground conduit system of electrical traction, from the London County Council Tramways at Camberwell-green, viâ Denmark-hill, Champion-park, Grove-vale, and Lordship-lane, to a point near the intersection of that thoroughfare with Crystal Palace-road."

Preservation of View from Richmond Hill.—The Parks and Open Spaces Committee brought up a Report containing the following recommendation, which was agreed to :—

"That the estimate of 68,500*l.* submitted by the Finance Committee be approved ; and that, subject to Parliamentary authority being obtained to enable the several county and other councils to contribute towards the purchase, and to enable this Council to maintain the land, the Council do resolve to contribute a sum of 36,000*l.* towards the cost of the acquisition of the Marble Hill estate as a public open space, such estate to be vested in, and remain under the control of, the Council in perpetuity. . . . ."

Bow Bridge Reconstruction.—The Bridges Committee submitted a Report on this matter, containing the following paragraphs :—

"In 1895 our attention was first called to the necessity of the widening of Bow Bridge. The width of the roadway between the parapets is 40 ft. 6 in., which, generally speaking, is a fairly good width for a bridge, but having regard to the fact that it is on the line of an important thoroughfare between West Ham and London, and that a considerable portion of the carriageway is occupied by a double line of tramway, it is insufficient for present requirements. . . . . In considering this question we have borne in mind that Bow Bridge is a county bridge, and that it is of importance to the public generally. We have also considered it from a navigation point of view. With a view, therefore, of providing an iron bridge to meet the needs of traffic, with an improved headway, we instructed the Engineer in June, 1898, to prepare a design showing a total width of 58 ft. between the inner sides of the two outer girders, of which 3 ft. would be occupied by the centre girder, as in the case of Lea Bridge, two roadways, each 18 ft. 6 in. wide, and two footways, each 7 ft. 10 in. wide. The width of the span of this bridge would be the same as that of the existing bridge, the foundations of the latter being used for the new one ; the headway at the centre of the span, however, would be 8 ft. 7 in. above Trinity high-water level, or 2 ft. more than the present maximum headway. This improved headway is practically maintained for the entire span, the level of the underside of the bridge at the abutments being only 4 in. below that at the centre of the span. The levels and gradients of the road surface of the approaches to the bridge would remain practically unaltered. The Engineer's estimate for the construction of such a bridge as is described above, including a sum of 3,430*l.* for a temporary bridge and road which it would be necessary to construct in connexion therewith, was 17,000*l.*, in addition to which must be added the cost of acquiring property and the compensation which would have to be paid for the temporary use of land, namely, 4,000*l.* . . . In December, 1900, the West Ham Corporation intimated that they were constructing a line on the south-east side of High-street, Stratford, for the purpose of making a 70-ft. road as far as Bow Bridge, and asked to be informed what would be the approximate additional cost for rebuilding the bridge 70 ft. wide instead of 58 ft.

Before replying to the West Ham Corporation it was necessary to make a careful comparison of the methods which would have to be adopted to accommodate traffic during the construction of a bridge either 58 ft. or 70 ft. in width. The conclusion we came to was that during the construction of a bridge 58 ft. wide the traffic would have to be provided for in the following manner—namely, the northern half of the existing granite bridge would have to be demolished, and the corresponding half of the iron bridge would then have to be erected. That during these operations one line of tram traffic and the general vehicular traffic passing from west to east would have to be accommodated by the construction of a temporary timber bridge with its approaches crossing the river Lea about 175 ft. south of the present bridge. That the other line of tram traffic and vehicular traffic passing from east to west would have to cross over the undemolished or southern half of the bridge, the pedestrian traffic being provided for by the erection of a temporary timber widening on the south side of the existing structure. During the construction of a bridge 70 ft. wide we found it would be possible to dispense with the temporary bridge and its approaches, as in the formation of a 70-ft. bridge the tram and vehicular traffic would be adequately provided for without involving any serious inconvenience or obstruction. Moreover, in the case of a 70-ft. bridge the southern portion of the existing granite structure would be first removed and the southern half of the iron bridge built, after which the whole of the traffic could be diverted on to the finished part while the formation of the northern half was in progress. The pedestrian traffic would, throughout the whole period of the rebuilding of the bridge, be accommodated by a temporary timber widening of the old bridge on its northern side. As the necessity for the construction of a temporary structure on the south side of the present bridge would thus, in the case of a 70-ft. bridge, not arise, a considerable saving would be effected. A still further reduction of the cost of a temporary bridge would be represented by the sum required for the purchase of the necessary property and for compensation to persons affected by the alterations ; also for the maintenance, lighting, &c., of the temporary bridge for about three years. Taking into account the increase in the width of the bridge, also the additional margin of strength necessitated by the augmented dead and live loads, the Engineer estimates that the approximate cost of a bridge 70 ft. in width would be 19,000*l.* Having regard to all the circumstances, we think it would be well that the scheme for the construction of an iron bridge 70 ft. in width should be adopted . . . We recommend :—'That the estimate of 21,200*l.* submitted by the Finance Committee for the reconstruction of Bow Bridge be approved, and that the reconstruction be undertaken by the Council on condition that the Lea Conservancy Board contribute 5,000*l.* towards the cost, namely, 19,000*l.*, of the actual construction of the bridge, and the West Ham Corporation one-half of the remainder, it being understood that the Council and the West Ham Corporation shall each bear the cost of acquiring the necessary property on its side of the river.'"

The recommendation was agreed to.

Fire Station, Brixton.—An estimate of 15,000*l.* for a new fire station at Brixton was approved.

Cubicles, Parker-street Lodging-House.—It was also agreed to spend 500*l.* on the construction of additional cubicles at Parker-street lodging-house.

Housing at Wood Green.—It was decided to spend 2,000*l.* on the development of the White Hart-lane estate, Wood Green.

Tenders.—The Parks and Open Spaces Committee recommended, and it was agreed :—

"That the necessary materials for repairing the tar-paved playground at London-fields be obtained from Messrs. Constable & Co., Ltd., at the following prices :—Topping, 19*s.* 9*d.* per ton ; dust, 16*s.* per ton ; and spar, 30*s.* per ton. . . ."

District Surveyor for North Battersea.—The Building Act Committee reported as follows, the recommendation being agreed to :—

"The Council on November 10, 1896, consented to the appointment by Mr. H. J. Hansom, District Surveyor for North Battersea, of a deputy to act for a period of one year, the state of Mr. Hansom's health being such as to prevent him from carrying out his duties efficiently. This arrangement has been renewed from time to time, and the Council, on July 30, 1901, consented to Mr. H. J. Hansom appointing his son, Mr. R. D. Hansom, as his deputy for a period of six months from July 11, 1901, in consequence of the death of Mr. W. H. Woodward, who at that time was acting as deputy for the district. When recommending this appointment, we also stated that the whole question of the district surveyors' districts was under our consideration, and that we hoped to be in a position to report fully upon the matter shortly, including in our Report the arrangements to be made with regard to the position of Mr. H. J. Hansom and the permanent supervision of the district of North Battersea. With regard to the district surveyors' district generally, we have formulated our proposals, which will be submitted to the Council for approval in the course of this month. As regards the case of Mr. H. J. Hansom, we have come to the conclusion that the existing arrangement under which the district is supervised by a deputy should cease, and that Mr. Hansom should resign his office. Mr. Hansom has been duly informed of our decision, and we have now to report that he has tendered his resignation. We shall report the steps to be taken for filling the vacancy when submitting the Report as to the districts generally ; in the meantime we have instructed the architect to make such arrangements as he considers necessary for the proper carrying out of the work in the district, as the appointment of Mr R. D. Hansom as deputy will, of course, terminate on the acceptance of the resignation of Mr. H. J. Hansom. We recommend :—'That the resignation of Mr. H. J. Hansom, District Surveyor for North Battersea, be accepted as from November 12, 1901.'"

Tenders for Electric Tramways.—On the recommendation of the Highways Committee, the following recommendations were agreed to :—

"(*a*) That, subject to the result of the usual inquiries proving satisfactory, the tenders of Messrs. Dick, Kerr, & Co., Ltd., be accepted for the supply, (A) for the sum of 25,964*l.*, of the continuous-current plant, and, (B) for the sum of 46,626*l.*, of the three-phase plant required for the electricity-generating stations to be erected at Greenwich, at the temporary station to be established near Loughborough Junction, and at sub-stations, in connexion with the reconstruction, for electrical traction, of the London County Council Tramways between (*a*) Westminster Bridge and Tooting, (*b*) Blackfriars-road and Kennington, and (*c*) Waterloo-road and St. George's-circus.

(*b*) That Messrs. Dick, Kerr, & Co., Ltd., be allowed to sublet (1) to the English Electric Manufacturing Co., Ltd., of Preston, the manufacture of the dynamos, generators, and other electric plant under both contracts ; (2) to Messrs. Ferranti, Ltd., the manufacture of the large engines under both contracts ; and (3) to Messrs. Belliss & Morcom, Ltd., the manufacture of the auxiliary engines under the contract (A) for the continuous-current plant."

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses :—

Lines of Frontage.

Dulwich.†—A pair of semi-detached dwelling-houses commenced to be erected on the north-west side of that portion of Canonbie-road, Forest Hill, running from south-west to north-east (Mr. W. A. Lewis for Mrs. E. S. Evans).—Consent.

Lewisham.—A dwelling-house on the west side of Bromley-road, Lee, to abut upon Ronver-road (Mr. C. W. Horser).—Consent.

Space at Rear.

Westminster.—A modification of the provisions of Part V. of the Act as to the extension above the diagonal line directed by Section 41 of that Act to be drawn, so far as relates to the erection of portions of blocks E, F, and G of residential flats known as St. James's Court, Buckingham-gate, Westminster (Mr. C. J. C. Pawley for Mr. R. Rickard).—Consent.

Width of Way and Lines of Frontage.

Hackney, North.—Houses on the north-west and south-east sides of Portland-avenue, Clapton Common, with portions of the boundaries of the forecourts between the external walls of the buildings and the street at less than the prescribed distance from the centre of the street (Mr. C. Cheston for Lord Amherst of Hackney).—Consent.

Width of Way and Working-Class Dwellings.

Rotherhithe.—Two intended dwelling-houses, to be inhabited by persons of the working-class, and proposed to be erected as an addition to Vine-street buildings, on the east side of Vine-street, Tooley-street, Bermondsey (Mr. A. R. M. Gunn for the London Labourers' Dwellings Society, Limited).—Consent.

The recommendation marked † is contrary to the views of the Local Authority.

NEW BOARD SCHOOLS AND THEIR SITES, LONDON.

THE School Board for London have just issued their annual schedule of the sites in respect of which they will seek to obtain a provisional order for the building of new, and the enlargement of existing, Board schools in London. The total number of scheduled sites is forty-one, but inasmuch as in each of four divisions two alternative sites have been chosen, the actual number of new sites to be taken amounts to thirty-seven. Taking a mean of the two areas for each pair of coupled sites we find that the thirty-seven sites cover an aggregate total area of 21 acres 26 poles (more or less), and are distributed amongst the following divisions :—Tower Hamlets—No. 537, Commercial-road East with garden ground, *or* Nos. 67-83 (odd), Bromley-street, with Nos. 62-80 (even), Portland-street, Stepney (1), Southwark—No. 46, Lant-street ; Nos. 205-7, Tabard-street, with Manciple-place and two houses in Pardoner-street, Southwark ; and No. 91, East-lane, Bermondsey (3). Marylebone — Nos. 32-8 (even), Haverstock-hill ; Nos. 29-33 (odd), Cromer-street, St. Pancras ; and Nos. 7 and 9, Well-walk, *or* the houses and gardens known as the Grove, Grove-lodge, Netley-cottage, and Terrace-lodge, in the Grove, Hampstead (3). West Lambeth—Vacant land in Sellincourt-road, Wandsworth ; part of the garden of Elmwood house, Upper Tooting, *or* a plot of ground on the northern side of Elmfield-road, Balham ; land, houses, &c., Nos. 24 6, Gaskell-street, adjoining the Larkhall-lane Board Schools, Wandsworth ; a portion of the Putney Athletic Ground, between Hotham and Erpingham roads ; two plots on the northern and south-western sides respectively of

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Garratt-lane, Wandsworth; land near Burntwood-lane, Earlsfield; Linden Lodge and grounds, with an adjacent plot in Bolingbroke-grove; the St. John's Hill House School; Nos. 18-24 (even), Sleaford-street; No. 1, Freke-road, Wix's-lane, Battersea; and a site in Gipsy-road, adjoining the Salter's Hill Board School (12). East Lambeth—No. 12, Ann's-place, adjoining the George-street Board School, Camberwell (1). Hackney—Nos. 1-4, Rutland-road, with the varnish works, abutting on the Lauriston-road Board Schools; and the Mission Hall, Tottenham-square, with Nos. 68-70, Tottenham-road (2). Greenwich—Nos. 23-33 (odd), Blackheath-road; land on the southern side of Mayston-crescent, Glenister-road; No. 48, Rowland-grove, Sydenham Hill-road; and Nos. 182-4, Maxey-road, Plumstead (4). Chelsea—Land with houses, forecourts, &c., having frontages to Tetcott-road, Burnaby-street, and Lots-road; Nos. 91-3-5, Marlborough-road with Nos. 01-3-5, Keppel-street, Chelsea; a strip of land on the northern side of Beaufort, otherwise Sedlescombe-road, Fulham; Nos. 1-5, Middle-row, with their gardens, &c., and land in South-row, adjoining the Middle-row Board School, Kensington; and land on the eastern side of a proposed continuation northwards of Frithville-gardens, *or* lands adjoining the Ellerslie-road Board School premises, with a part of Occupation-road, Hammersmith (5). Finsbury—Nos. 38 9, Clerkenwell-close; No. 6, Barnsbury Park; Nos. 29-39 (odd), Hanley-road, with Nos. 20, 40-2-4-6, Grenville-road, and garden-ground in Grenville-road; Nos. 48-70 (even), Scholefield-road, with Nos. 43-5, Nicholay-road; Nos. 150-66 (even), Cloudesley-road; and No. 40, Romilly-road, abutting on the Ambler-road Board Schools, Islington (6). The Board recently resolved to commit to the care of the London County Council the rehousing of occupants who will thus be dispossessed of their tenancies.

Correspondence.

To the Editor of THE BUILDER.

GRUNDY'S FLUSHING CISTERN.

SIR,—In regard to your article on our exhibit at the Sanitary Conference, Water Fittings Exhibition, we desire to call your attention to the following points:—

I. You state that "the apparatus is worked *by the turning* of a two-way valve." This is not so, as the valves are lifted, but first closing the outflow passage before opening the inlet valve, and vice versa, and thereby effectively preventing any waste.

II. The cistern, or flushing tank, standing empty until used is omitted. This we claim as one of its great advantages, being a sure protection from freezing.

III. "That the discharge lacks the drive of the syphon of other flushing tanks." We maintain that as good or better drive is given by the expanding of the compressed air within the automatically closing tank, given at the start of the flush, as is the case by the drive of the syphon. Having of late tested the flush, we find that two gallons can be discharged within three to six seconds according to pressure ranging from normal to 55 lbs. to the square inch.

D. GRUNDY, Manager,
Sanitary Appliance Syndicate.

*** No. 1 is a mere question of accurate wording. We saw no section of the valve. No. 2 is an important point in favour of the cistern, which we omitted to mention. In regard to No. 3 our opinion is not altered. No doubt there is an impetus given to the *start* of the flush by the expansion of the cushion of compressed air at the top of the cistern, but the depth of this can be but small, and after this cushion of air has resumed its normal condition, the rest of the discharge is by gravitation alone, and should require a good head to make an efficient flush. The cistern is an admirable one, and we recommend it strongly—only with this precaution.—ED.

The Student's Column.

GAS AND GAS FITTINGS.

20.—THE RELATIONSHIP BETWEEN THE GAS VENDOR AND THE GAS CONSUMER. RECENT CONCESSIONS. HOW TO READ THE METER. HOW TO ASCERTAIN THE RATE OF CONSUMPTION OF ANY GAS-CONSUMING APPLIANCE.

DURING the last ten or fifteen years a remarkable change has in many districts occurred in the attitude of the gas manufacturer to the gas consumer.

Formerly a gas company considered its work satisfactorily completed when gas had been carried to the consumer's meter. If, after the gas had passed the meter, the consumer through ignorance consumed the gas in wasteful burners, it was not to the interest of the gas company to teach him how to obtain more light or heat with a smaller consumption of gas. That was the opinion at one time commonly expressed by officers of gas companies.

With the passing of the nineteenth century, however, a radical change was witnessed in the business methods adopted by many gas companies and gas-producing Local Authorities. The gas vendor of the present day realises that it is to the interest of the shareholder as well as of the consumer to aid the consumer to obtain the highest possible efficiency in light, heat, or power, as the case may be, from every cubic foot of gas consumed. The introduction of leaky supply pipes and wasteful burners into a consumer's premises by an incompetent local ironmonger, whose opinion of the value of a burner is entirely dependent upon his rate of commission, is no longer viewed with equanimity by the gas manufacturer.

Managers of gas undertakings now vie with one another in devising new schemes for popularising the use of gas both for domestic and industrial purposes; but each company has its own rules as to the extent to which it will assist consumers in obtaining an efficient gas supply at small initial cost, and as to the class and variety of gas-consuming appliances which it will let out on hire or lend to consumers without charge. The following list of concessions which have already been granted by one or more companies or gas-producing Local Authorities shows that some gasworks managers have already recognised the necessity of adopting modern business methods, and will indicate to the consumer the kind of assistance he may hope to obtain from the gas vendor:—

1. Gas Supply Pipes.—Many gas companies will provide and fix all gas pipes of any size and for any purpose at cost price, while a few will supply and fix the pipes free of charge. As most gas companies keep a large staff of competent fitters constantly employed upon this class of work, it is usually a good policy to have the fittings put in by the gas company's men.

2. Flat Flame Burners for Lighting Purposes.—In some cases these are supplied free of charge, and in others at cost price.

3. Incandescent Gas Burners.—These are in some cases supplied by the gas company at a lower price than that charged by shopkeepers, and in several cases the gas company undertake to maintain incandescent burners in good condition, and renew all mantles and chimneys whenever necessary at a nominal charge.

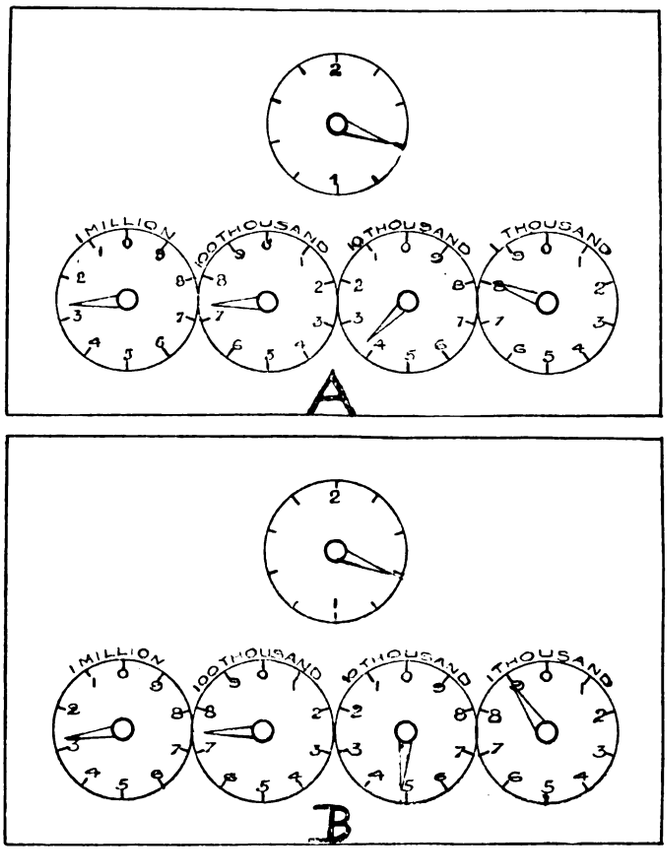

Fig. 52.—Index on Consumer's Meter, showing a consumption of 273,800 cubic feet at A, and of 274,900 cubic feet at B.

4. Gas Fires, Stoves, and Cookers.—These are let out on hire by most gas companies at a small charge. The rental for a fire for a dwelling-room of ordinary size is usually from 1s. 6d. to 2s. 6d. per quarter, and for a domestic cooker of moderate size from 2s. to 3s. per quarter. A few gas companies will lend these appliances to consumers without charge.

5. Ring Burners.—Small ring burners, suitable for boiling a kettle of water, are in many cases lent to consumers free of charge.

6. Gas Engines.—At High Wycombe these may be obtained on the hire-purchase system or on the continuous hire system. Few, if any, other gas companies have, however, yet undertaken to supply these on any terms whatever.

7. Periodical Inspection of Fittings.—Some companies now undertake without charge to keep and maintain all ordinary fittings in a clean and efficient condition. Inspection is made either upon receipt of request or by periodical visits. In most places the officers of the gas company will examine a consumer's fittings upon special request without charge.

All this "free-of-charge" business must, of course, be paid for eventually in the price paid for the gas, but by minimising the danger attendant upon the use of gas by periodical inspection of the fittings by competent officers of the gas company, by showing the consumer how to obtain the greatest efficiency from the gas with a minimum pollution of the atmosphere, and by assisting him to obtain appliances at low cost which he would otherwise reject, there is little doubt that real progress has been made since the time when the internal gas fittings of buildings were left to men who sometimes were incompetent fitters, and frequently were quite ignorant of the most elementary laws relating to the combustion of gas.

Reading the Meter.—The reading of the dials on an ordinary gas-meter is an extremely simple process; but many consumers neglect to watch the meter because the interpretation of the indications is thought to require special knowledge.

To ascertain the rate of consumption per day, per month, or per quarter, as the case may be, it is necessary to make a record of the position of the pointers on the dials at the commencement of the period and also at the end of the period, and to subtract one figure from the other. In fig. 52, for example, the positions of the pointers are shown at the commencement of a week at A, and their positions at the end of the week at B.

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The dial with only two figures upon it which is seen above the four main dials is not taken into account when the meter is read by the gas inspector. The pointer of the dial with the superscription "1 thousand" makes a complete revolution for every 1,000 cubic ft. which pass the meter, and as the dial is divided into ten equal parts, the pointer moves from one numeral to the next in succession during the passage of 100 cubic ft.

The pointer of the dial superscribed "10 thousand" makes a complete revolution for every 10,000 cubic ft. which pass the meter, and consequently the movement of the pointer from one numeral on this dial to the next indicates the passage of 1,000 cubic ft.

The pointer of the dial superscribed "100 thousand" makes a complete revolution for every 100,000 cubic feet which pass the meter, and consequently the movement of the pointer from one numeral to the next represents a consumption of 10,000 cubic feet.

The pointer of the dial superscribed "1 million" makes a complete revolution for every million cubic feet which pass the meter, and consequently the movement of the pointer on this dial from one numeral to the next indicates the passage of 100,000 cubic feet.

In fig. 52 the positions of the pointers when 273,800 cubic feet have passed the meter since the pointers were all at zero are shown at A, while the positions of the pointers, say, one week later are shown at B. The consumption indicated at B is 274,900. Therefore in one week 1,100 cubic feet (274,900-273,800) of gas have been consumed.

Testing the Rate of Consumption of any Gas-consuming Appliance.—The dial situated above the four main dials (fig. 52) on the meter affords a means of ascertaining the rate of consumption of any particular appliance and of the soundness of all the gas fittings within a building. The pointer of this dial makes one complete revolution for every two cubic feet of gas which pass the meter, and as there are ten equal subdivisions on the dial, the movement of the pointer from one subdivision to the next indicates the passage of a fifth part of one cubic foot of gas. Larger meters have a dial divided into cubic feet, and the pointer makes a complete revolution for every five or ten cubic feet of gas which pass the meter.

When all the burner cocks are shut off and the main cock on the meter outlet is turned full on, the pointer on this dial will remain quite stationary if the pipes and fittings are gas-tight, but will change its position if a leakage of gas is occurring at any point.

Having ascertained that all the fittings are gas-tight by observing that the pointer remains quite stationary for a period of, say, fifteen minutes, the gas appliance to be tested should be put in action while all other burners are still kept shut off. The number of revolutions made in a fixed period, say ten minutes, should be noted, and the consumption per hour then be calculated.

If in ten minutes the pointer makes one complete revolution the consumption per hour is 12 cubic ft.; and if it makes four and a half revolutions in this peried the rate of consumption is 54 cubic ft. per hour. In this manner the rate of consumption of any burner or cooker or other appliance may readily be ascertained.

In addition to testing the rate of consumption of the different appliances in use it is a good practice to keep a record of the gas consumed from quarter to quarter, and if the consumption suddenly increases largely without apparent cause beyond the quantity consumed in the corresponding quarter of the previous year, to send the meter to be tested at one of the public meter-testing stations.

BOOKS RECEIVED.

EVERY MAN'S OWN LAWYER. By a Barrister. Thirty-ninth Edition. (Crosby Lockwood & Son.)

PROGRESSIVE DESIGN FOR STUDENTS. By James Ward. 5s. (Chapman & Hall.)

REFUSE DESTRUCTOR FOR NOTTINGHAM.—In reference to the application of the Nottingham City Council to the Local Government Board for sanction to borrow 21,000*l.* for the erection of a refuse destructor at the Eastcroft depôt, London-road, Mr. M. K. North, Local Government Board Inspector, held an inquiry at the Guildhall Grand Jury-room, Nottingham, on the 6th inst. Mr. Harris, of the Town Clerk's Department, Mr. A. Brown, City Engineer, and Mr. F. B. Lewis, his assistant, represented the Corporation.

OBITUARY.

MR. E. W. FRY.—Mr. Edward Wickens Fry, well known in Dover as an architect and surveyor, has just passed away at his residence, St. Martin's-terrace, at the age of sixty-five years. At one time he was in partnership with Mr. Whitley, and they jointly carried out several building undertakings, but for about thirty years he had devoted himself to his special professional pursuits as an architect and surveyor. He drew the plans for Messrs. Binfield Bros.' building in the Market-square, and for the new Waterloo House for Messrs. Hart & Co. He also, at a rather earlier date, designed and carried out the rebuilding of the counting-house, offices, and warehouses of Messrs. Dickeson & Co. He was for some time engaged in advising the Local Authorities at Deal and Walmer as to their drainage, and he carried out a good many alterations of premises at Sandwich. Mr. Fry had long been a member of the Kent Archæological Society. His hobby was to collect rare books relating to his own profession as an architect, and he had got together one of the best collections of Kentish histories and works on the archæology of the county of Kent to be found in any private library. During the agitation which preceded the carrying out of the large scheme of street widening in Dover he zealously worked for the scheme of widening the main thoroughfare, which ultimately proved successful, and when the old buildings on the south side of Biggin-street came down, many of the new elevations in that improved thoroughfare were from his designs. Mr. Fry commenced his public career as a member of the Town Council in the year 1881. Before his second term as a Councillor expired he was elected an Alderman, in November, 1886. He occupied a seat on the Aldermanic Bench for six years, and at the end of that term, in 1892, ceased to be a member of the Town Council. When the Kent County Council was constituted by the Act of 1888, he was selected as one of the Dover representatives, which post he continued to hold until the time of his death. He for many years was a director of the Dover District Permanent Benefit Building Society, and at the time of his death was Chairman of the society. Mr. Fry was President of the Dover Working Men's Institute from 1884 till 1887, and he gratuitously drew the plans for the enlargement of the Institute premises. He was up to the time of his death one of the trustees in whom the property of the Institute is vested. The funeral took place on the 8th inst. at Charlton Cemetery, when there were present at the graveside a large number of townsmen.—*Dover Express.*

GENERAL BUILDING NEWS.

UNITED FREE CHURCH, NEWLANDS, GLASGOW.—The foundation-stone has just been laid of the new United Free Church at Newlands, Langside. The site on which the new church is being erected is at the corner of Langside-road and Riverside-road. The church, which is cruciform in plan, having nave, transepts, and choir recess, is designed to accommodate 800. Part of the accommodation is provided in an end gallery, constructed over the main vestibule. The principal entrance is by a large porch at the south-east corner, the other two doors being intended for egress. From the porch access is obtained to the main vestibule, at the north end of which is the ladies' cloakroom. The main vestibule, closed in by swing-doors, is arranged as a general cloakroom. A cloakroom is also provided for the choir at the other end of the church, near the choir platform. Other accommodation provided is as follows:—A new vestry, large classroom for eighty, a kitchen for church purposes, and a house for the church officer. Recesses are formed at each side of the choir recess for a divided organ. The feature of the interior of the church will be the large aisle arches, with octagonal piers, all of freestone. Owing to the wide span of these arches and their consequent height, a clearstory is dispensed with, and the church lighted at the side walls by large traceried windows placed high above the floor. The aisles will be simply passages, no pews being placed behind the stone piers. All the windows and doors will show stone jambs inside. The roof timbers will all be exposed, showing an open timber hammer-beam roof. The windows are to be double glazed. The heating is to be by hot-water pipes and radiators. The exterior of the church is to be built of Giffnock stone, and the stonework of the interior of Auchenheath stone. The work is being superintended by Mr. John Sim, inspector of works, and Mr. H. E. Clifford is the architect.

NEW CHAPEL, DONINGTON.—A new Primitive Methodist chapel has just been completed at Donington, Lincolnshire. The total cost, including the site and some buildings which are to be converted into schools, was 1,000*l.* The chapel was built by Mr. Barnsdale, of Donington, Mr. W. Grenfield, of Boston, being the architect.

CHURCH, MOYNALVEY, IRELAND. — The new Church of the Nativity, Moynalvey, county Meath, will shortly be dedicated. The architect of the new church is Mr. W. A. Byrne, Dublin.

CHURCH, PETERSHAM.—Lady Sudeley laid the corner-stone of a new church at Petersham Lodge on the 8th inst., to be erected at a cost of 10,000*l.*, with seating accommodation for 600. The building is Romanesque in style, with a nave, two aisles, and a tower. The architect is Mr. John Killy.

PACKINGTON CHURCH.—The Church of the Holy Rood, Packington, Leicestershire, was opened on October 22, after necessary repairs. A good specimen of Late, and rather Domestic, Perpendicular, it was thoroughly "restored" in the Georgian period, when the traceried windows and other decoration disappeared. Having again become dilapidated, it has now been repaired by the mending of stonework and roofs where absolutely necessary, and the area of nave and aisles has been refloored with plain red squares, and reseated. Some interesting discoveries were made of sepulchral slabs (sixteenth century), ancient flooring, and six magnificent bench ends, which were found, face downwards, in the mould under the seats. These are now once more bench ends in the nave, put back exactly as found, though some are rather decayed. The chancel is still untouched; it has a flat plaster ceiling cutting across the windows. The architects are Messrs. Prothero & Phillott, of Cheltenham; and the contractors Messrs. Collins & Godfrey, of Tewkesbury.

PLAISTOW HOSPITAL EXTENSION.—An extension of the Borough Fever Hospital at Plaistow was opened recently by the Mayor (Councillor A. Bishop, J.P.). The buildings occupy a site in Samson-street and Credon-road, and have been erected by the direct employment of labour by the Works Department, the architect being Mr. E. T. Hall, of London. The total provision for patients' beds is 179, and all buildings for patients are kept above-ground on arched open basements. The Isolation pavilion contains fifteen beds on two stories in various wards—four beds, two beds, and one bed—all communicating directly with the fresh air, so that each ward may be separately used without reference to its neighbour. In the open air, but under cover, are the staircases, the sanitary accommodation, bath-rooms, larders, bath-docks, &c. Close to the entrance to the scarlet fever corridor is the admission room, where patients are received, examined, and bathed. They then are carried to the scarlet fever pavilions. The larger of the new pavilions contain thirty-one beds on two floors. There is no inside communication between the floors, the one being divided from the other by a concrete and steel floor with suspended ceilings. The pavilion contains two wards, each of fourteen beds, one two-bed ward and one one-bed ward, ante-room for the Sister, and two ward kitchens. From these staffrooms, observation windows enable a view to be obtained of all beds. There are on each floor, close to the staffrooms, a lavatory and water-closets for the use of the nurses, as well as a larder and linenroom. For the use of the patients there is a detached sanitary tower with a connecting bridge, having through currents of air. This contains, on each floor, two baths, two water-closets, four lavatory basins, and a nurses' sinkroom. Each large ward is 83 ft. long by 26 ft. wide, and 13 ft. high. In the centre is a Faience stack containing two fireplaces, and around the smoke flues are grouped aspirating flues for taking off the vitiated air near the ceiling. All the smoke flues are swept from the open basement. In addition to the fires there are hot water radiators enclosed in cases into which cold fresh air is admitted at the bottom and passes over the radiators, coming out at the top warmed to a temperature of about 60 deg. Under each of the fourteen beds there is an inlet ventilator for cold fresh air. The inlet of fresh air is regulated so as to change the whole volume of air in the ward three times in an hour. There are windows on both sides facing east and west as well as at the end. The floors are of teak, laid on concrete, and the walls are of cement, painted and varnished. All internal angles are concave. There are external staircases throughout the hospital leading to the upper floors of the wards, and lifts for the service of the first floor with coals, food, &c., and there are iron fire-escape staircases from each upper floor. The hospital throughout is lighted by electricity, fitted with fire hydrants, electric fire alarms, and with telephones affording means of communication between every part night and day. The Department (Mr. George Wise, Works Manager), has carried out the whole of the foundations and superstructure, the fire and sound proof floors and ceilings; the artificial stone dressings, pier caps, stairs and yard pavings; the plumbing, plastering, painting, and smith's work; the drainage and the sanitary arrangement. The specialists for electric wiring and lighting are Messrs. Young & Marten, Ltd., of Stratford; for boilers and steam piping, Messrs. Tinkers, Ltd., of Hyde; for heating and hot water supplies throughout the hospital, Messrs. Z. D. Berry & Sons, of Westminster; for laundry fittings, the Cherry Tree Machine Co., Ltd., of Blackburn; for kitchen fittings, Messrs. J. & F. May, of Holborn; for fire mains and appliances, Messrs. Shand, Mason, & Co., of Blackfriars; for electric bells, fire alarms, and telephones, Messrs. Croggon & Co., Ltd.; for asphalting, the Val de Travers Asphalte Paving Co., Ltd., and Messrs. Pilkington & Co.; for disinfectors and destructor, Messrs. Manlove, Alliot, & Co., Ltd., of Nottingham; for Bangor slating, Mr. J. J. Etridge, jun., of Bethnal Green; for lifts, Messrs. R. Waygood & Co., Ltd., of Borough, S.E.; for terra-cotta dressings, Messrs. J. Stiff & Sons, of Lambeth; and faience chimney stacks in the wards, Messrs. Doulton & Co., Ltd. The red brick facings have

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been supplied by the Ibstock Collieries, Ltd.; the stock bricks by Messrs. Wakeley Bros.; blue lias and selenitic by Messrs. C. Nelson & Co., Ltd.; glazed bricks throughout by the Farnley Iron Co., Ltd.; Portland cement by Messrs. Martin, Earle, & Co., Ltd.; white glazed baths and lavatory basins by Messrs. Doulton & Co., Ltd.; white and brown glazed channels and gullies by Messrs. Broad & Co., Ltd.; drain-pipes by the Archer Sanitary Tube Co.; Palmer's patent flushing tanks by Messrs. J. Knowles & Co., Ltd.; glazed stoneware manholes by Messrs. J. Cliff & Sons, Ltd.; water-closets, water-closet apparata, and slop-sinks by Messrs. Dent & Hellyer; patent hot and cold water taps by Messrs. B. Rhodes & Son; floor-springs for doors and the opening gear for fanlights and rooflights by Messrs. Smith & Turner; stoves and chimney-pieces by the Albion Iron Co. and Messrs. Yates, Heywood, & Co.; oak parquetry floors by the Acme Wood Paving Co., Ltd.; rain-water gutters and pipes by Messrs. Macfarlane & Co., Ltd., and Messrs. McDowall, Steven, & Co., Ltd. The contract price is 98,000*l.*

HARROW SCHOOL CHAPEL.—The Governors of the School have approved of the plans prepared by Mr. Aston Webb for a committee which has recently been appointed for erecting a memorial to the forty-eight old Harrovians who have died in the South African campaign. The memorial will take the shape of a prolongation, eastwards, of the north and south aisles of the School Chapel, at a cost of about 6,000*l.* The chapel was built in 1857, after Sir G. G. Scott's designs; its stained glass forms a memorial to the twenty-five old Harrovians who fell in the Crimean war.

VILLA RESIDENCE, KIRKCALDY.—A villa residence, with stabling, coachman's house, &c., is being erected in Dysart-road, Kirkcaldy, from the designs of Mr David Forbes Smith, the following being the contractors for the work:—Masons, Messrs. Balfour Bros., Sinclairtown; joiner, Mr. Matthew Wishart, Kirkcaldy; slaters, Messrs. Currie & Cant, Kirkcaldy; plumbers, Messrs. Blyth & Dougall, Sinclairtown; and plasterer and tile works, Mr. Henry Masterton, Sinclairtown. This villa is the first to be erected on the land belonging to Mr. M. B. Nairn, just being opened up for building purposes. Mr. David Gilmour is contractor for the streets proposed to be made to the north and west of the site, and also for the laying-out of grounds, terraces, &c.

LIBRARY, HULL.—The new Central Library, which has been erected in Albion-street, Hull, at a cost of nearly 20,000*l.*, was opened on the 6th inst. by Lord Avebury. The building has been erected in the Renaissance style from the designs of Mr. J. S Gibson, architect, London. The principal frontage is to Albion-street, and is executed in red brick from Leicestershire, and warm brown stone dressings and ornamental parts from Ancaster. The front consists of two stories, the lower one having square-headed windows surmounted by recessed arches, and the upper windows having balconies with wrought-iron balconettes, into the design of which has been wrought the City Arms. At the corner next the Church Institute, where the library buildings project some 12 ft. in front of the Institute, an octagonal tower has been carried up. The upper part of the tower is carried out in stone, and breaks into a domed form, with detached columns below the dome. The building extends right through to Baker-street, where a frontage one story high has been carried out in a style to correspond with the main front. Above the main entrance is a shield, supported by figures of a boy and girl, containing the name of the library, while in the gable is a figure of "Literature" carved in relief. The front entrance gives access to a wide entrance hall containing the main stair, which is divided from the entrance hall by stone columns and arches, and the floor of this hall is laid with marble mosaic. On the left is the ladies' reading-room, 25 ft. long by 14 ft. 6 in. wide. Next to this room is the magazine-room, 26 ft. long by 26 ft. wide. On the right is the librarian's room, 24 ft long by 15 ft. wide, which will probably also serve as a committee-room. Adjoining this room is placed the lending library, 62 ft. long by 34 ft. wide, and 20 ft. high to the top of the open roof. The whole of the bookstacks behind the counter are of oak fitted with Tonks' patent adjustable fittings, while a book lift and private stair communicate with the reference department on the first floor. Telephones are also fitted between the chief rooms and the librarian's room. A wide corridor runs from the back of the hall to the Baker-street entrance, and off this corridor, near to Baker-street, is the newspaper reading-room. This room is 47 ft. long by 32 ft. wide and 20 ft. high. The walls of the entrance-hall and corridor and stairs have been covered with tiles. The reference library is on the first floor, at the top of the main stairs, and is a room extending the whole length of the Albion-street frontage. The dimensions are 72 ft. long by 30 ft. wide, and 21 ft. high to the top of the ceiling. The centre part of the room is to be used by readers, and tables have been provided to accommodate forty, the ends of the room being fitted up as a book store. The general contractors for the work are Messrs. Armitage & Hodgson, of Leeds; the furniture and fittings have been executed by the North of England School Furnishing Co, of Darlington, from the architect's designs; the electric wiring, fittings, and telephones have been supplied by Mr. S. P. Wood, of Hull. The works have been supervised by Mr. W. H. Williams, clerk of works.

HOMES FOR INEBRIATES, WHALLEY, LANCASHIRE.—These homes are about to be erected on the Brockhall Estate, Langho, Whalley, for the treatment and care of inebriates committed by the various courts in the County Palatine. So far, plans have only been prepared by Mr. Littler, the County Architect, for the accommodation of females, the tender for which has just been let for the sum of 73,418*l.* Primarily, the Lancashire Inebriates Acts Board scheme provides for the erection of two separate institutions for the reception and treatment of inebriates—one for males and the other for females—and that these buildings shall be at a distance of some 500 yards from each other. Each of the institutions will be provided with a reasonable area for recreation purposes, which can be subdivided for classification purposes if thought necessary, and the whole enclosed by an unclimbable iron railing. It is proposed to erect the establishment for the females almost in the centre of the property, and that for males about 500 yards north-east thereof on the high ground in the vicinity of the Brockhall Farm. The main frontage to all these buildings will have a south-west aspect. The plans show that accommodation has been provided for fifty males and 100 females, but the administrative blocks have been so designed as to admit of an increase in the number of inmates up to 100 males and 200 females. In respect to the provision made for females, the administrative block will be centrally situated, and will contain the necessary offices, visiting and committee-rooms, provision for the officers and staff, together with kitchens, &c., stores, and dining-room for 200. The living accommodation will be provided in six blocks of two semi-detached houses, situate three on the east and three on the west side of the administrative block, so that twelve distinct and separate dwellings will be available, which will give all the facilities required for classifying the inmates. Each house provides accommodation for eight inebriates, with a dayroom, attendants'-room, scullery, boot-room, store, bathroom, and a separate bedroom for each inmate, and these houses will be approached from the administrative block by means of covered ways. The laundry, which will be used for the inmates and staff of both institutions, will be placed behind the administrative block for women, and in an adjoining building will be the steam boilers for heating the buildings, which will also supply the steam and hot water for the laundry and for the cooking apparatus in the women's institution. In regard to the accommodation for males, the scheme is similar to that proposed for the females, with a central administrative block and dining-room accommodation for about 100. It is anticipated that there will be three blocks of two semi-detached houses to accommodate forty-eight inmates to commence with, one of which can be used as a reception house. At the rear of this administrative block will be situate the electric generating plant for the lighting of the whole of the two institutions, and the boilers necessary for the purpose will supply the steam and hot water for heating and cooking in the men's institution.

GOLF CLUB HOUSE, HOLLINWELL, NOTTS.—The new club of the Notts Golf Club, situated at Hollinwell, has a view over the course towards Mosley Hills. The kitchen has been considered as the key of the plan, and is so situated as to serve direct the ladies' room, the dining-room, the gentlemen's club-room, and the dressing-room. The three first mentioned apartments are arranged along the front, and each has a door opening on to the verandah. A dressing-room is provided with lockers for nearly 200 members, and has at one end a radial drying closet for airing members' clothes, and also lavatory and shower-bath. Another lavatory is situated close to the main entrance, and accommodation is also provided for a steward, who will live upon the premises. The main building has been erected by Messrs. Gilbert & Son, builders, of East Kirkby, whose contract was 2,160*l.*, and the plumbing and heating have been carried out by Messrs. Humphrey & Co., of Nottingham. Mr. A. Gaunt, of Bulwell, obtained the contract for lockers, &c., to the dressing-rooms, and Messrs. Dennett & Ingle, of Nottingham, have erected the professionals' shop and caddies' shelter. Mr. J. Harris and Mr. H. G. Watkins have acted as joint architects for the whole of the work.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Schmidt's Superheating Co. have appointed Messrs. Willcox Bros., 15, Norfolk-street, Sunderland, as their representative for Northumberland, Durham, and Yorkshire; and the Providence Engineering Works, Rhode Island, U.S.A., as their representatives for the United States.

DESTRUCTOR WORKS, BIRMINGHAM.—Mr. H. Percy Boulnois, Local Government Board Inspector, held an inquiry at the Council House, Birmingham, on the 6th inst., into the City Council's application to borrow 31,600*l.* for purposes of a refuse destructor, stabling, &c., at Rotton Park-street Wharf. The town clerk (Mr. E. O. Smith) informed the inspector that the Health Committee had for some time had under consideration the necessity for erecting additional furnaces for destroying refuse at the wharf in question. The two furnaces at present there were altogether inadequate to the work to be done, being capable of burning only about fifty tons per week of unscreened refuse. There was also a great need for stabling at the wharf. Evidence having been given, Mr. Boulnois inspected the site of the proposed buildings.

MEMORIAL CHURCH PLATE.—The ladies of Natal, in conjunction with sympathisers in England, have decided to commemorate the memory of those who have fallen in defence of the colony during the present campaign in South Africa, by presenting to the Cathedral at Pietermaritzburg a set of altar vessels, comprising two chalices with patens, two burettes, and flagon, all richly jewelled with precious stones. The necessary funds having been fully subscribed, a design by the Rev. Ernest Geldart has been accepted. The work of execution has been entrusted to Messrs. Taylor and Clifton, of London.

SOUTH KENSINGTON NATIONAL ART COMPETITION.—In the last of these competitions a gold medal for architectural drawing was awarded to a student for a drawing which was a direct copy of Mr. Paul's drawing of Malvern Abbey Church in the New Year's number of the *Builder* for 1897. The attention of the authorities at South Kensington has been drawn to this, and we understand that they have withheld the gold medal.

LINCOLN'S INN FIELDS.—In the course of next week will be sold at auction, by order of the Commissioners of H.M. Office of Works, the materials and fittings of Nos. 30A, 30-1-2, Lincoln's Inn Fields, and No. 2 Serle-street, together with the Post Office premises at the corner. The site was taken lately for the proposed enlargement of the offices of the adjoining Land Registry in Lincoln's Inn Fields.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of the following sanitary inspectors, viz., Mr. C. M. Longden in Finsbury, Messrs. A. W. Stiles and H. Quaintrell in Stepney, and Miss E. G. Gamble in Lambeth.

DISCOVERY OF AN ANCIENT CAVE DWELLING IN NOTTINGHAM.—An interesting antiquarian find has just been made while clearing the site of some old property on the south side of Hounds-gate, immediately opposite the lace factory of Messrs. Copestake. The workmen have come across an oblong rock chamber, measuring 8 yds. in length (from north to south), and about half as much in width. The height is about 7 ft. An idea was at first entertained that the place had been a chapel, but the geographical plan precludes that idea. In the centre is a finely-wrought pillar, oblong in plan, and conforming to the direction of the excavation. Unlike the vast majority of Nottingham rock excavations, this one exhibits detailed architectural features. The central pillar measures in diameter 44 in. by 16 in. at the capital moulding, which latter is 7 in. in height, and is divided into three horizontal courses, each semi-circular in section. The south end, or front, of the pillar is wrought with three semi-circular pillarets, almost touching each other, and extending down to the floor level. At the height of about 5 ft. their continuity is interrupted by the projecting capital moulding, above which they are continued as roof vaultings. The same style of groinings spring from the two sides of the column, and extend in splayed form across the roof. The latter, on either side of the pillar, presents a semi-circular elevation, and evidently indicates the Norman period of architecture. These side-roof mouldings are not continued down the sides of the pillar as in the front, however, and at the back, or north face, no mouldings appear either on column or roof. The projecting capital moulding alone is carried entirely round the four sides. The pillar is a little wider at the bottom than at the top. Though slightly damaged in places, on the whole the latter is in good preservation. At the opposite spring of the arches, or along the east and west sides of the apartment, and at the same level as the capital moulding, occurs a moulded projection or string-course, which, on the west side at least, yet retains a perfectly formed cable ornament, 3 in. in depth, which has suffered very little decay. This is not continued across the north end, while southward it terminates on either side, as though roughly broken off, two or three yards from the end of the excavation. The explanation appears to be that the latter has at some later date been enlarged in this direction. This view gains strength from the circumstance that the disposition of space is not symmetrical. The space between the arch springs on the west side is 5 ft. 2 in., and on the east side 5 ft. 4 in., or practically the same. Taking the opposite directions, however, while the distance between the pillar and the north end measures 7 ft. 3 in., that between the pillar and the south end measures 12 ft. 6 in. The present entrance is by a brick arched flight of steps at the south-west angle of the excavation, but the original entrance was possibly in the centre of the south end, for there a bricked-up space, large enough for a doorway, may be seen, and the rock on either side shows evidence of arrangements for barricading the same. Possibly this old entrance was reached by a pit or shaft, but later excavations may settle this detail. The chimney, affording proof of the former occupation of the place as a dwelling, is in the north-west

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angle of the roof, and consists of a circular shaft like that of a well, about 2 ft. 6 in. in diameter. Its higher portion has been bricked around. The place has been utilised in modern times as a cellar, for not only is coal slack to be seen about the floor, but such dates as 1823 have been scratched in several places. Mr. English, the contractor for the work now going on, informs us this interesting place will be buried again in about a fortnight's time.—*Nottingham Guardian.*

CENTRAL TECHNICAL SCHOOL, LIVERPOOL.—In reference to the account of this building in our last issue, Mr. J. R. Scales of Liverpool, asks us to mention that he acted as clerk of works during the progress of the building.

CAPITAL AND LABOUR.

THE PENRHYN QUARRY. — Since work was resumed at the Quarry on June 11, the number of men employed has steadily increased, especially during the last month, which showed an increase of forty, the increase during September having been twenty-seven. These included twenty-nine slatemakers and thirty-eight labourers and daymen. The production of slates has similarly increased very satisfactorily, in fact, the output last month was at the rate of 34,000 tons per annum.

THE STRIKE OF SLATERS AT HULL AND BRIDLINGTON.—This strike has come to an end, in the twelfth week of the struggle. In February last the operative slaters and tilers of Yorkshire approached their employers, and submitted a code of working rules for the county. Subsequently, joint conferences were held, and in July last an agreement was arrived at, and a new code of rules established and signed by the representatives of both parties. These rules came into force on August 1, and August 17 the Hull men took exception to them and came out on strike. The Operatives' Amalgamation, true, it is stated, to their agreement with the employers, declined to support their Hull members, and refused them strike pay or travelling money. They also advertised for and drafted unionist workmen into the city to fill the places of the strikers. The Yorkshire employers drafted their senior apprentices into Hull, as also did other members of the National Association of Slate Merchants and Slaters, until a superabundance of labour obtained. The men then made overtures for a "conditional" surrender, but to no purpose. They eventually attended before their District Executive Council, signed the rules, agreed upon terms for repayment of the outpocket expenses occasioned by the dispute, and gave an undertaking to abide by the ruling of the District Committee in the future. Consequently the Hull employers have opened their yards, and taken on such of the men as they had vacancies for.

LEGAL.

BUILDERS' LIABILITY UNDER THE WORKMEN'S COMPENSATION ACT, 1897.

THE case of Alice Knight *v.* William Cubitt & Co came before the Court of Appeal composed of the Master of the Rolls and Lords Justices Stirling and Mathew on the 7th inst., on the appeal of the defendants, the well-known firm of builders and contractors, from the award of the County Court Judge of Brompton under the Workmen's Compensation Act, 1897, the applicant being the widow of a man killed by an accident arising out of, and in the course of, his employment as a "housebreaker."

It seemed that Messrs. Cubitt & Co. entered into a contract with Messrs. Woolland to alter two houses known as Nos. 16 and 17, William-street, Knightsbridge, and under the contract No. 17 had to be demolished and rebuilt. A sub-contract was entered into by Cubitt & Co. with a house-breaker named Clements, the latter undertaking the demolition of the house. Knight was in the employment of Clements, and while engaged on the demolition of the building he was by an accident killed. The building was originally over 30 ft. in height, but at the time of the accident had been reduced to about 11 ft. in height. The party wall between Nos. 16 and 17, however, remained standing, and it exceeded 30 ft. in height. It was said that Cubitt & Co. habitually entered into contracts to demolish buildings and to rebuild them, but they never did the work of demolition themselves, always entering into a contract with a housebreaker to do this part of the work. The County Court Judge held that Cubitt & Co. were liable under the Act, and awarded the applicant 278*l.* compensation. From this decision Messrs. Cubitt & Co. now appealed.

Mr. Ruegg, K.C., and Mr. Minton-Senhouse appeared for the appellants; and Mr. Edmond Browne and Mr. Valentine Browne for the applicant (the widow).

Mr. Ruegg contended that as the work of demolition was merely ancillary to and formed no part of the trade or business carried on by Cubitt & Co., the case came within the exception in Section 4 of the Act. Messrs. Cubitt & Co. never demolished buildings, so that the demolition was no part of their trade or business. The learned counsel also contended that the employment of the deceased man at the time of the accident was not on a building exceeding 30 ft. in height, the building then being about 11 ft. in height. It had been decided that the Act did not apply to employment on a building which was being constructed, but which at the time of the accident did not exceed 20 ft. in height, though when completed it would exceed 30 ft. in height (Billings *v.* Holloway). The same rule therefore applied to the demolition of a building. The learned counsel further contended that Messrs. Cubitt & Co. were not "undertakers" within Section 7, Sub-Section 2, of the Act.

Without calling upon counsel for the applicant,

The Master of the Rolls, in giving judgment, said he was of opinion that the appeal must be dismissed. They had two, three, or four points discussed, but those that impressed themselves most on his lordship's memory were (1) that the term "undertaker" ought to be so construed as to exclude Messrs. Cubitt & Co. from liability in this case; (2) that the work to be done by Clements, the sub-contractor, who employed the injured man in the work he was doing, was ancillary to and not the main work that Messrs. Cubitt & Co. had undertaken; and (3) that the building on which the man was engaged in demolishing was not 30 ft. high at the time of the accident. He would deal with the points in the inverse order, the last argued first. They had heard the finding of the learned County Court Judge that the building on which the man was engaged was over 30 ft. high at the time of the accident That was a finding of fact, and all this Court had to do in dealing with that question was to see whether there was any evidence on which the Judge could find that the building was over 30 ft. high at the time of the accident. What the man was engaged in doing was working on a building which was being demolished, and a substantial part of it, viz., the party wall, which was an essential part of the building when it existed as a building, was standing to a height of more than 30 ft. It appeared from the evidence that what the man was actually working on at the time of the accident was this party wall, and thus working on a substantial part of the building which remained and was not demolished and was more than 30 ft. high. His Lordship could not say that the learned Judge was not entitled to find that a substantial part of the building was more than 30 ft. high at the time of the accident. So much for that point. Then as to the "undertaker" point. It was said that Messrs. Cubitt & Co. were not "undertakers" at all because there was evidence that they did not usually themselves, by their own workmen, deal with the demolishing of buildings. But his answer to that was that it was, on the evidence, a part of their business to demolish. It might be that Messrs. Cubitt & Co. did not regard it as their special business, but they could not undertake to build without demolishing at all. Here they contracted to demolish certain buildings with a view to erect another building on the site, and they also contracted to alter or make alterations in the other building, which was not to be pulled down. In their contract they undertook both obligations, and that, from the evidence, was their usual practice. He thought that was evidence that Messrs. Cubitt & Co. were "undertakers" within the meaning of the Act. He construed the word "undertake" in this Act by reference to the Act itself. It might have a different meaning in other Acts of Parliament.

Lord Justice Stirling concurred.

Lord Justice Mathew, who also concurred, said he had never been able to entertain any doubt that Messrs. Cubitts, as part of their business, undertook to demolish the house in question. It was, as had been said, a matter of convenience to the firm to make a sub-contract with a sub-contractor who employed persons called "housebreakers," as Cubitt & Co.'s workmen were usually employed to build, and they might not be as skilful in that particular work as those whose business it was to demolish. The only other point he need refer to was as to the height of the building. The Court had the finding of the County Court Judge on the subject, and his lordship should infer that he had more evidence before him than appeared on the note. A witness in the case had stated that at the time of the accident he was working at a big piece of the party wall, and that the deceased man was working a foot away from him. He thought there was abundant evidence on which the County Court Judge could find that the deceased man was employed in demolishing a building more than 30 ft. high at the time of the accident, and for those reasons he considered the appeal should be dismissed.

The appeal was accordiugly dismissed with costs.

CASE UNDER THE PUBLIC HEALTH ACT.

THE case of the King *v.* Maude and Another came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Darling and Channell on the 8th inst., in which Mr. Roskell appeared to show cause against a rule nisi for a *certiorari* to bring up and quash a conviction of the Guardians of the Hunslet Union for not complying with a certain by-law made under Section 157 of the Public Health Act, which required them to deposit the plans for a new workhouse with the local Sanitary Authority. It appeared that the guardians were building the workhouse by the order of the Local Government Board, and it was contended that the by-law did not apply to such a case. The rule nisi had been obtained on the grounds that the Justices had no jurisdiction and that the service of the summons was not sufficient.

At the conclusion of the arguments their Lordships on the question of service thought that the rule should be made absolute, so that the proceedings could be commenced again *de novo*.

The rule was accordingly made absolute, but without costs.

Mr. Brooke Little appeared for the Guardians in support of the rule.

THE MEASUREMENT OF BUILDINGS UNDER THE WORKMEN'S COMPENSATION ACT.

THE case of McGrath *v.* Robert Neill & Sons came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 8th inst., on the appeal of the defendants (the employers) from the decision of the County Court Judge of Manchester under the Workmen's Compensation Act, 1897. The case raised the question as to the proper point at the bottom of the building to be measured from, so as to decide under Section 7, Sub-Section 1, of the Act whether the building at the time of the accident exceeded 30 ft. in height.

The applicant was a workmen in the employment of the defendants, and was so injured in an accident which arose out of and in the course of his employment. The only question to be decided was whether the building on which the accident happened exceeded 30 ft. in height. The measurements taken and proved before the County Court Judge showed that from the bottom of the footings above the concrete foundations to the top of the building was 33 ft. 2½ in.; from the top of the footings to the top of the building, 31 ft. 2½ in.; from the basement floor to the top of the building, 29 ft. 10 in.; and from the level of the street to the top of the building, 29 ft. 5¾ in. Some evidence was given at the trial that at the time of the accident the footings were covered in. The County Court Judge thought that the standard of measurement to be taken was from the bottom of the footings, and as this measurement showed a height of more than 30 ft., he made an award in favour of the applicant. The employers now appealed, on whose behalf it was contended that the proper place to measure from was from the level of the ground where the foundations had been covered in.

Without calling upon counsel for the applicant (the respondent on the appeal), the Master of the Rolls, in giving judgment, said that in his opinion the proper measurement to be taken was a question of fact in each case, provided there was evidence to support the finding. The fact that part of a building was below the level of the ground did not prevent it being over 30 ft. in height. From the evidence it seemed that probably the footings were covered in, but his lordship could see no evidence that there was more than a flooring at the top of the footing. The presumption from the evidence was that the flooring at the time of the accident had not got beyond that stage. His lordship thought that the building should have been measured from the top of the footing, and as the building then exceeded 30 ft. in height the applicant was entitled to succeed.

The Lords Justices concurred, and the appeal was dismissed with costs.

Mr. Clavell Salter appeared as counsel for the appellant, and Mr. McCleary for the respondent on the appeal.

EMPLOYERS' LIABILITY ACT:

ASSISTING IN WORK WITHOUT INSTRUCTIONS, AND THE CONSEQUENCES.

AT Brompton County Court, on Monday, before Judge Stonor and a jury, Albert Clark, a builder's labourer, 7, Petley-road, Fulham, S.W., brought an action under the Employers' Liability Act, 1880, against Mr. James Wendon, builder, 1, Danehurst-road, Fulham, claiming damages in respect of personal injuries sustained, owing, it was said, to negligence on the part of the defendant or his servants.

Mr. R. S. Nolan, counsel, appeared for the plaintiff, and Mr. J. W. Moyses, counsel, defended.

Counsel for the plaintiff explained that in May last the plaintiff was employed by the defendant as a builder's labourer on the Beaufort House Estate, North End-road, S.W. On May 10 the man was assisting in digging a trench which had reached a depth of about 10½ ft., but had not been "timbered" or strutted, to prevent the sides falling in. The soil was soft and sandy, and, of course, was more likely to fall than a heavier soil. It appeared that before dinner time the foreman told the men working in the hole to timber the hole as soon as they came back at half-past one. It appeared also that there was a deficiency of timber on the job, and this accounted for the strutting not having previously been done,

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As the plaintiff was assisting in the strutting, one side of the hole gave way, causing a large piece of timber to fall upon him. The man was thrown heavily upon his back, and the piece of timber injured a bone in the region of his left eye. The man was detained as an in-patient at the Queen's Jubilee Hospital for four days, and for four weeks he was incapacitated for work.

The plaintiff bore out his counsel's opening statement. He added that the hole was in treacherous soil of sand and stones. He did not hear the foreman say anything about the strutting, except that as soon as they came back from dinner two of them were to put in the timbering. He maintained that the strutting in such a hole should be put in before the hole exceeded 6 ft. in depth. There was plenty of timber on the job, but he did not know whether the foreman would let them use it. In work of the kind in question it was usual to employ men receiving extra payment for strutting the hole. There were no such extra-paid men to do the strutting at the time of the accident.

Cross-examined: It was true that the hole had a battering, making it narrower at the bottom than at the top, the object of which was to prevent the sides falling in. He denied that two of the other men were told by the foreman to do the strutting, and that he was directed to do nothing but the digging.

Walter Osborne, a builder's labourer, 87, Bayonne-road, Fulham, who was working in the hole at the time of the accident, stated that the foreman told him and another man, named Cattermole, to do the "timbering up." The foreman did not tell all the men in the hole to assist in that part of the work. With the exception of himself and Cattermole, the men were told to get on with the digging. There was plenty of timber about which could have been used for strutting up the hole.

The Judge: I do not think it is any use going on with this case. There must be a non-suit. The man might have been entitled to claim under the Workmen's Compensation Act, but if he had recovered compensation I should have given costs against him.

Mr. Moyses: I do not think he could have recovered under the Workmen's Compensation Act, because there was no building 30 ft. in height, nor steam and other mechanical power in question. I think the case is quite outside the Act. I do not now, ask for costs.

CASE UNDER THE LONDON BUILDING ACT, 1894.

THE case of the King *v.* D'Eyncourt came before the Court of Appeal, composed of the Master of the Rolls, and Lords Justices Stirling and Mathew, on the 11th inst., upon arguments against a rule *nisi* which had been granted by this Court, calling upon Mr. D'Eyncourt, the Metropolitan police magistrate, to show cause why he should not state a case for the opinion of the Court.

It appeared that a Mr. Jas. Ellis had been convicted by the magistrate on a charge of having committed an offence under the London Building Act, 1894, viz., by erecting a building beyond the general line of buildings in a certain street. The magistrate made an order for the demolition of the building in question, and refused to state a case on the ground that no question of law was involved. The Divisional Court refused an application for a rule *nisi* and a writ of *mandamus* commanding the magistrate to state a case, but on a similar application made to the Court of Appeal the rule was granted.

Mr. Horace Avory, K.C. (with him Mr. Daldy), who appeared to show cause against the rule being made absolute, took the preliminary objection that as this was a criminal cause or matter the Court of Appeal had no jurisdiction to hear it.

Mr. Freeman, K.C. (with him Mr. R. Cunningham Glen) argued that it was not a criminal cause or matter within the meaning of Section 47 of the Judicature Act, 1873.

Their Lordships, however, held that it was clearly a criminal cause or matter, and that they had no jurisdiction to entertain it, and discharged the rule accordingly, on the preliminary objection taken by Mr. Avory.

ANCIENT LIGHTS:

IMPORTANT DECISION OF THE COURT OF APPEAL.

IN the Court of Appeal, composed of the Lord Chief Justice and Lord Justices Vaughan-Williams and Romer, on the 13th inst., a considered judgment was delivered in the case of Warren and Others *v.* Brown, on the plaintiffs' appeal from the judgment of Mr. Justice Wright in the Queen's Bench Division on August 8, 1900. The case, which was reported in the issues of the *Builder* of August 11, 1900, and November 2 last, raised with regard to ancient lights the question whether the right which is acquired by statutory prescription is a right to the continuance of substantially the whole quantity of light which has come to the windows during the twenty years, or is limited to a sufficient quantity of light for all ordinary purposes of inhabiting or business.

The facts of the case are shortly as follows:—The plaintiffs are the owner and tenant of a house in Leicester, and they claimed damages and an injunction in respect of the obstruction of the access of light to certain ancient windows in a room on the ground floor and another on the floor above, both rooms facing to the south. For a length of about 17 ft. in front of these rooms the defendant had raised his building from a height of about 20 ft 6 in. to about 26 ft., but had set it back about 2 ft. or 3 ft., so that the width of the street between the two buildings, which was about 17 ft., became about 19 ft. Mr. Justice Wright found, as a fact, that the defendant had not obstructed or diminished to any material extent, if at all, the light coming to the upper of the two rooms in question. With regard, however, to the four windows on the ground floor, he found that the defendant had materially diminished the light which the defendants enjoyed from the windows for twenty years past, but that abundant light remained for all ordinary purposes of inhabitancy or business. The plaintiff Baum, who was the tenant of the premises, had for less than twenty years carried on in the premises, and particularly on the ground floor, a manufacture of hosiery by means of machinery which required a very exceptional quantity and quality of light for the adjustment of filaments to fine needles Prior to this manufacture the manufacture of boots and shoes, which required good but not special or extraordinary light, was carried on in the premises. Mr. Justice Wright held that the defendant by his building had so diminished the light that it was materially insufficient during some part of the day for the special requirements of Baum's industry, and he found that the plaintiff's premises had throughout the twenty years before action been suitable for such a manufacture as that carried on by Baum. His Lordship decided that the plaintiffs had made out no case for a mandatory injunction or for damages, and gave judgment for the defendant with costs, but in case he should be held wrong in his law on appeal he assessed the damages at 10*l.* for the tenant and 200*l.* for the reversioners. Hence the present appeal of the plaintiffs.

The arguments on the appeal concluded on the 20th ult., when judgment was reserved.

Mr. Hugo Young, K.C., and Mr W. H. Stevenson appeared for the appellants; and Mr. Warmington, K.C, and Mr. Neilson for the respondent.

Lord Justice Romer read the judgment of the Court, which was to the following effect:—In this case Mr. Justice Wright had found that certain of the plaintiffs' ancient lights had been substantially interfered with by the defendant's new building, and that they had thereby suffered substantial damage. On this finding one would have expected that judgment would have been entered for the plaintiffs, but the learned judge dismissed the action on the ground that notwithstanding the substantial diminution of the ancient light abundant light remained for all ordinary purposes of inhabitancy or business. The learned judge appeared to think that in law there was a sort of standard in the matter of light, and that if a house was extremely well lighted the light could be diminished so long as it was as useful for habitation or business as the average run of houses in that locality. That was an erroneous view of the law. If ancient lights were interfered with substantially and damage ensued, the persons injured were entitled to relief, and it was impossible to hold that the statutory right was not interfered with, merely because the house still came up to some standard of light required for inhabitancy or business. The plaintiffs were entitled to relief, and judgment must be entered in their favour for the amounts assessed. The defendants must pay the costs of the action and of the appeal.

THE LONDON COUNTY COUNCIL AND FIRE-RESISTING STAIRCASES.

THE case of the Consolidated Properties Co. *v.* Chilvers came before a Divisional Court of King's Bench, composed of Justices Ridley and Bigham, on the 13th inst., on an appeal by the company from a conviction obtained at the instance of the London County Council for non-compliance with a notice given under Section 17 of the Factories and Workshops Act, 1891, calling upon the company, which carries on business at 112, Queen Victoria-street, to provide a new staircase of fire-resisting materials to be constructed on the company's premises, connecting with all the floors and the roof. It appeared that the premises were occupied by tenants of the company, who were not using them for a factory; and in order to provide the new staircase it would be necessary to interfere with the ground floor, and this could not be done, as the company said they could not interfere with the tenants, and that therefore it was impossible for them to comply with the notice. On proceedings being instituted at the Mansion House against the company for not complying with the notice, the company proposed to give evidence of these facts, but the magistrate refused to hear it, and fined the company. An appeal was then lodged by way of special case to the Divisional Court, but their Lordships directed the matter to stand over till an arbitration had been held as to what was necessary to be done under the notice. The arbitrators made certain recommendations which the company said they were prepared to carry out, and the object of the present application was to quash the conviction on these terms.

On behalf of the London County Council it was urged that the proper order to be made on the special case was that the conviction should be affirmed and the appeal dismissed with costs.

In the result their lordships allowed the appeal, and quashed the conviction, but without costs.

Mr. Bray, K.C., and Mr. Tudor Howell appeared for the appellants; and Mr. Dumas for the respondent.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

12,762. — AN ELECTRICAL WATER HEATER: *A. E. Greville and A. W. Greville.*—The water ir caused to flow on to a metal plate within the geyses and down the heated electrical conductors to another plate and so to the outlet, both plates being mounted upon insulating brackets, and suitable terminals being provided. The wires may be either hollow, or grooved, or tapered, &c., and also encased in order to obviate short circuiting.

12,782.—CONTRIVANCES FOR WATER-CLOSETS: *F. A. Fergusson*—The inventor provides a raised foot-rest, and fashions the seat with a curve which is sloped downwards from the front.

12,797.—TAPE MEASURES: *F. J. Brunello.*—The tape is drawn out between rollers, and a spring pawl is disposed in engagement with a ratchet-wheel upon the reel-shait. The tape can be freely pulled only by pressure upon a projecting stud.

12,803.—CEMENT, LIMESTONE, AND OTHER KILNS: *H. Schmidt.*—The material is fed from a rotatory drying and preliminary heating tube into a chamber, and thence is passed into the burning-chamber, its quantity being regulated with a slide. There are openings for the supply of fuel and the introduction of tools, and flues which carry the products of combustion through a tube into the chimney.

12,816.—A ROAD-SCAVENGER: *W. H. H. Miller.*—The front of the machine, which is worked by hand, scrapes, and a brush mounted behind sweeps, the road. Curved arms, fitted with scales and passed through screw-clamps, adjust the brush, which is to be lifted or lowered in a frame that swings upon an axle, and is driven with gear from the main carrying wheel; the sweepings pass over an apron into one receiver, and the scrapings are thrown into another receiver. The former receiver has a loose front, and is attached to the scraper with a turn-button so that the two will rise together and, by means of a cord around a roller, will draw a scraper forwards for clearing the dustpan.

12,834.—WASHSTAND FITTINGS: *F. Wilson.*—The washstand is fitted with a basin which has an overflow and a plug for discharge to the waste-pipe. At the back is arranged a cistern having a lid and a discharge-pipe and cock. The cistern may be wholly concealed by the looking-glass, or one side of it may be placed behind the drawers. In another form it may be carried separately by a bracket on the wall.

12,846.—SAFETY LAMPS: *F. Glasmachers and C. Müller.*—The electrodes of a portable secondary-battery lamp consist of pierced leaden tubes which are filled with oxide paste, and are set in two metallic cases having screw covers lined with some non-conducting material. Tubes upon a glass cylinder around an incandescent lamp connect the cases. The cells are connected to the lamp and a switch, as well as to the charging-terminals, by wires that pass through the tubes and behind the linings.

12,864.—CONSTRUCTION OF PARTITIONS, WALLS, &C.: *F. F. Golding.*—Netted or expanded lathing is made up into sheets, which are fastened with staples on to temporary supports, and one side is coated with plaster, concrete, or cement. The supports are taken away when the coating has dried, and then the other side of the lathing is similarly coated. For adjusting the length of a pair of telescopical boards which press against the ceiling and floor, U-shaped guiding clips are affixed to the boards and camped with wing nuts and screws, or a guiding clip having two loops takes a toggle-jointed support, being pivoted on to a loose bracket, which, if the joint is forced inwards, is tilted so as to grip one of the boards.

12,887.—A CREMATORY FURNACE: *S. Willoughby and H. H. Fox.*—The retort is heated with liquid-fuel burners that are also fed with air and steam, whilst the resultant gases pass through a water-curtain into a chamber. There is an air space around the retort, and the furnace is constructed in the vault of a mortuary chapel which has a permanent grave, at the bottom of which is a trolley upon which the coffin is laid before the process of cremation.

12,918.—CONSTRUCTION OF GATES FOR WEIRS: *W. B. Skotnicki and Count A. F. Ostrowski.*—A chain joins a sluice-gate to the end of a lever which is pivoted on to a framework secured to the piles, a float is fastened adjustably to the other end of the lever for regulating the position of the sluice-gate. If the gate should be suddenly raised, and to an excessive height, the inclined portion of a hook upon the gate will move a pole aside out of its retaining grooves, then a chain and counter-weight will lift the pole into engagement with the hook and so lift the gate into its proper place for floods. By another arrangement the gate can be attached directly to the end of the lever, and the float is in

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that case fastened to the middle. Guides and a rod pivoted on to the framework limit the horizontal movement of the float, and it may be contrived that the fall of the counter-weight shall close a circuit and give a signal. The invention comprises a separate flood-gate of which the motion is restricted with stops and a chain.

12,925.—HEATERS AND RADIATORS FOR STOVES: *E. Soutter.*—These are devised for use with gas, hydrocarbon, or similar lamps or stoves about or above which the inventor places a series of water-tubes which are surrounded with a conical metallic funnel. The spiral tubes being connected to the heater, the radiator is filled from a vessel attached above it, and the products of combustion escape to a cowl upon the apex of the funnel. Other modifications are specified, by one of which a dome-shaped hood takes the place of the conical heating coil.

12,936.—PROCESS OF MOULDING TILES AND BRICKS: *M. F. Solon and W. Tellwright.*—An inclined block worked with a hand-wheel, an endless chain, a wheel-nut, and a screw lift and lower the bottom-plunger, which, after powdered marl or other cheap material has been filled into the mould, is lowered about one-sixteenth of an inch, when powdered clay is filled in above the marl, and the plunger is again lowered, a facing-glaze being put over the clay. The stem of the lower plunger fits in a socket of an inclined block, and when lifted with a treadle and lever will eject the brick or tile. An upper plunger can be employed for pressing the clay in one single operation, or the force may be exerted after each layer has been put into the mould, of which the depth can be increased with perforated and super-imposed plates. Confer also No. 225 of 1900.

12,938.—MECHANISM FOR LOCKS: *J. Legge.*—A boss upon the tail of the bolt works on a pin which is affixed in the casing, the arm of the bolt is worked by the arms of the follower, and above the bolt is a pin which carries the spring; behind the head of the bolt is a shield against dust.

12,944.—ELECTRICAL SWITCHES: *H. F. Clayton, T. Bell, and S. S. Berry.*—A boss of which the sides are flat and which is fitted upon the central pin carries the contact arms, the handle which embraces the arms is adjusted loosely upon the pin, and a quick break is effected by means of a pin that is regulated with a spring and slides within a recess in the base.

12,970.—PROCESS OF MOULDING BRICKS: *R. T. Hughes.*—Horizontal plungers that work through the open sides of the mould fashion indents or panels in the sides of the bricks, and in place of a slide for closing the mould the inventor adopts a cover mounted upon a vertical frame which has guides and is lifted and lowered with cams; a vertical rod that slides through a cross-bar on the frame carries the discharge-plunger, and with the lowering of the frame will lie upon the bed-plate, the mould being closed with the upper plunger. Confer also Nos. 6,239 of 1895, and 7,801 of 1899.

12,973.—AN ELECTRICAL INDICATOR: *Siemens and Halske A-G.*—For high pressures the inventors devise a metallic disc surrounded with a ring, the one being fixed and the other being mounted upon an axle, which is fitted also with a non-conducting pointer that traverses a scale, and is regulated by a spring. The ring and disc are oppositely electrified, the movable part being turned by the action of the charged air that streams from its tangentially-directed points. For the spring may be substituted a weight, and for the pointed disc a notched flat ring, and condensers and impedance coils connected with the indicator will afford compensation for variation of frequency of alternating pressures.

12,990.—FLUSH-WATER APPARATUS: *W. Franklin.*—A pipe from the crown of the bell-siphon extends to a pneumatic push, the long leg is trapped in the casing, and an air-escape pipe and a ball-valve are fitted on to the crown of the siphon. A part of the compressed air is forced out by the pipe when the push is worked, and when it is released the reduced pressure will cause the water to flow over the crown, and thereby set the siphon in operation.

13,029.—AN APPLIANCE FOR USE IN MOULDING BRICKS, &c.: *J. Koepff.*—The inventor seeks to furnish means of escape of surplus clay; he fashions the sides of the mould with bevelled meeting-edges, and with recesses for ornamental pattern-plates. The plungers are similarly bevelled. Set-screws and adjusting-screws fasten the sides of the mould in the box or casing.

13,047.—A FIRE-ESCAPE: *H. Behrens.*—The upper end of a ladder which turns upon a pivot at its middle point is attached to a balcony with a self-acting hook when it is needed for use; at other times it is to be turned into a horizontal position along the front of the house.

13,052.—CONSTRUCTION OF WALLS, &c.: *E. Prüss.*—Hoop-iron bands stretched at right angles to one another constitute a framework of which the rolled ends are fastened to hooks or staples in the beams, posts, walls, and so on; slabs, bricks, or tiles laid with mortar, in which the bands are embedded, are filled into the spaces between the bands. The mode of construction extends to outer walls and double walls. For a partition or garden wall is erected a wooden frame, of which one side is faced with tiles or bricks bound together with hoop-iron strips.

13,064.—A FIRE OR SIMILAR ALARM: *F. O. Schöppe.*—The expansion of a spring as it becomes heated effects its contact with the point of a screw, so as to close the circuit of an electrical bell; an index-finger upon the screw is to be set to a number marked upon a dial that denotes the temperature at which the alarm should be sounded.

13,072.—AN APPLIANCE FOR STAGE SCENERY: *J. G. Rossman.*—The inventor fashions the braces with hinged foot-irons that carry screws, of which the collars fit in recesses in the foot-irons; the angle of inclination of the braces may be changed at will and the screws will not be easily lost.

MEETINGS.

FRIDAY, NOVEMBER 15.

Architectural Association.—Mr. Max Clarke on "The Sanitation of a Country House." 7.30 p.m.

Institution of Mechanical Engineers.—8 p.m.

SATURDAY, NOVEMBER 16.

Dundee Institute of Architecture.—Visit to St. Andrews.

MONDAY, NOVEMBER 18.

Royal Institute of British Architects.—Mr. R. Anning Bell on "Mosaics," with lantern slide illustrations. 8 p.m.

Liverpool Architectural Society.—A collection of books on architectural subjects will be on view. 6 p.m.

TUESDAY, NOVEMBER 19.

Institution of Civil Engineers.—Further discussion on the paper by Messrs. W. Kaye Parry, M.A., and W. E. Adeney, D.Sc., on "The Discharge of Sewage into a Tidal Estuary;" and, time permitting, a paper to be presented for discussion, on "The Treatment of Trades' Waste Bacterially," by Mr. William Naylor. 8 p.m.

WEDNESDAY, NOVEMBER 20.

Society of Arts.—Opening address of the 148th Session, by Sir William Henry Preece, K.C.B., F.R.S., Chairman of the Council. 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

St. Paul's Ecclesiological Society.—Mr. H. C. Richards, K.C., M.P., on "John Wesley in City Churches." 8 p.m.

THURSDAY, NOVEMBER 21.

Carpenters' Hall, London Wall.—Written examination on Sanitary Building Construction. 5 p.m.

FRIDAY, NOVEMBER 22.

Architectural Association Discussion Section.—Mr. G. H. Smith on "Canterbury Cathedral," illustrated by lantern views. 7.30 p.m.

Birmingham Architectural Association.—Mr. J. A. Gotch on "Architecture of the Eighteenth Century in England."

Glasgow Architectural Craftsmen's Society.—Mr. G. Herbertson on "Foreign Competition in the Building Trades." 8 p.m.

SATURDAY, NOVEMBER 23.

Carpenters' Hall, London Wall.—Viva Voce Examination in Sanitary Building Construction. 12 noon.

British Institute of Certified Carpenters.—Visit to the Vauxhall Bridge Works. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

October 28.—By PROTHEROE & MORRIS (on the estate).

Clacton-on-Sea, Essex.—King's Parade, &c., 53 plots of building land, f. £1,542

October 29.—G. NICHOLS, HOWES & Co. (at Chepstow).

Shirenewton, Mon.—The Shirenewton Hall Estate, about 583 acres, f. (in lots) 20,455

October 31.—CHINNOCK, GALSWORTHY & CHINNOCK (at York).

Thornton Watlass, Yorks.—Freehold farm and seven cottages, area 51 a. 2 r. 12 p., including the advowson and manorial rights 3,400

A freehold residence and 0 a. 3 r. 9 p., f. 300

Snape, Yorks.—Gebdykes Farm, 107 a. 1 r. 38 p., f. 2,400

Well, &c., Yorks.—Mowbray Hill Estate, 613 a. 1 r. 29 p., including the advowson 12,400

Holly Hill and 15 a. 2 r. 2 p., f. 1,700

Acclom House Farm, 437 a. 2 r. 31 p., f. 8,400

Well Hall Farm, 136 a. 1 r. 10 p., f. 4,600

Parnoby's Farm, 58 a. 3 r. 9 p., f. 1,300

Snape, Yorks.—Snape Langwith Farm, 116 a. 1 r. 19 p., f. 1,310

Low Grounds Farm, 209 a. 3 r. 38 p., f. 1,950

Well, Yorks.—Langwith House Farm, 458 a. 3 r. 13 p., f. 3,300

Well Manor House and 40 a. 0 r. 14 p., f. 1,460

House, smithy, and 16 a. 1 r. 31 p., f. 480

Various cottages and 28 a. 1 r. 5 p., f. 1,875

The Millbank Arms p.-h. and 0 a. 1 r. 30 p., f. 580

House, four cottages, and 11 a. 3 r. 11 p., f. 450

Six freehold houses and 12 a. 3 r. 6 p. 775

A freehold holding and 16 a. 1 r. 36 p. 370

A holding, three houses, and 10 a. 1 r. 32 p., f. 435

A freehold holding and 16 a. 2 r. 27 p. 630

Three strips of land, 3 a. 1 r. 18 p., f. 180

October 31.—By C. RAWLEY CROSS & Co. (at Shepherd's Bush.)

Shepherd's Bush.—43, Wendell-road, u.t. 977 yrs., g.r. 6*l.*, r. 30*l.* 355

1, 9, to 17 (odd), Westwick-gardens, u.t. 60 yrs., g.r. 75*l.* 12s., r. 279*l.* 16s. 2,220

93, Godolphin-rd., f., r. 30*l.* 550

5 to 10, 12 and 20, Norland-rd., u.t. 65½ yrs., g.r. 64*l.*, r. 282*l.* 3,015

11, Tunis-rd., u.t. 70 yrs., g.r. 5*l.* 10s., e.r. 36*l.* 250

Hammersmith.—161, Blythe-rd., u.t. 75 yrs., g.r. 9*l.* 10s., e.r. 55*l.* £550

November 2.—By W. B. HALLETT (at Goring).

Goring, Oxon.—The Glebe, and 2 a. 2 r. 29 p., f. 3,500

A freehold building site, 3 r. 29 p. 1,000

November 5.—By MUSKETT & SONS.

Wood Green.—Clarence-rd., Paraguay Cottage, f., r. 38*l.* 570

By ROBINS & HINE.

Dalston.—3 to 10 and 19, Laurel-st., and 2, Victoria-grove West, u.t. 41, 21½, and 17 yrs., g.r. 24*l.* 10s. 1,410

Norwich Union.—Two leasehold redemption policies for 1,600*l.*, payable in June, 914 300

Wimbledon.—23 to 28 and 31, Quicks-rd., u.t 78 yrs., g.r. 28*l.* 4s. 1,420

By JAMES LEWIS & Co.

Tooting.—165, High-st., u.t. 67 yrs., g.r. 7*l.*, r. 32*l.* 230

Balham.—3, 23, and 29, Balham New-rd., u.t. 25 yrs., g.r. 14*l.* 8s. 320

3 and 5, Fernlea-rd., u.t. 64 yrs., g.r. 16*l.*, r. 8*l.* 690

44, Fernlea-rd., u.t. 64 yrs., g.r. 7*l.* 10s. 345

54, Bedford-hill, u.t. 62 yrs., g.r. 8*l.* 430

72, Rossiter-rd., u.t. 72 yrs., g.r. 10*l.* 10s., r. 36*l.* 220

Clapham.—134 and 136, Cavendish-rd., u.t. 25 yrs., g.r. 13*l.*, r. 64*l.* 300

FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Richmond, Surrey.—Petersham-rd., the Compasses p.-h., u.t. 19½ yrs., r. 160*l.* (including mortgage) 4,790

November 6.—BUNCH & DUKE.

Hackney.—220, Mare-st., f., e.r. 60*l.* 800

DOWSETT, KNIGHT, & Co.

Notting-hill.—218 and 220, Walmer-rd., u.t. 27 yrs., g.r. 4*l.* 15s., r. 50*l.* 300

Thresher-pl., a range of stabling, u.t. 27 yrs., g.r. 3*l.*, r. 70*l.* 400

18, 20 and 22, Tobin-st., u.t. 27 yrs., g.r. 190

Regent's Park.—23, Park-cres., u.t. 16¾ yrs., g.r. 64*l.*, r. 350*l.* 2,600

Hyde Park.—5, Cleveland-sq., u.t. 45 yrs., g.r. 21*l.*, r. 150*l.* 1,760

51, Cleveland-sq., u.t. 47½ yrs., g.r. 20*l.*, r. 130*l.* 1,600

181, Gloucester-ter., u.t. 37 yrs., g.r. 2*l.*, r. 170*l.* 2,200

171, Gloucester-ter., u.t. 37 yrs., g.r. 2*l.*, r. 160*l.* 2,250

11 Porchester-mews, u.t. 37 yrs., g.r. 2*l.*, r. 35*l.* 330

By DUNN, SOMAN, & COVERDALE.

Woodford.—Grove Hill-rd., f.g.r. 21*l.*, reversion in 83 yrs. 520

Upton Park.—Plashet-lane, f.g.r. 4*l.* 4s., reversion in 82 yrs. 100

By FOSTER & CRANFIELD.

Thornton Heath.—152 to 162 (even), 176, 178, 180, 184, and 186, Frant-rd., f., e.r. 429*l.* 6,800

Brixton.—Mancrell-rd., f.g.r. 70*l.*, reversion in 83 yrs. 1,780

By MARK HUBBARD.

Notting Hill.—5, Bonchurch-rd., u.t. 65 yrs., g.r. 8*l.* 10s. 390

54, Southam-st., u.t. 62 yrs., g.r. 7*l.* 300

Gray's Inn-rd.—10, Wilson-st., u.t. 10 yrs., g.r. 6*l.* 10s., e.r. 42*l.* 125

By J. & W. JOHNSON & Co.

Walthamstow.—4 to 14 (even), Tower Hamlets-rd., f. 7,260

By C. SPARROW & SON.

Finchley.—1, Eton Villas, f., e.r. 6*l.* 500

By WYATT & SON (at Chichester).

Chichester, Sussex.—Rumboldswyke, freehold farm buildings and yard 300

26 and 27, Washington-st., f. 250

94, 97, 98, 99, and 100, Oving-rd., u.t. 923 yrs., g.r. nil 630

By BALLARD & MARSH (at Twickenham).

Teddington.—Church-rd., Hill Rise and a plot of land adjoining, f. 600

SWAN WOODCOCK (at Stratford).

Forest Gate.—158 and 160, Sherrard-rd, f. 800

November 7. By GLASIER & SONS.

Hendon.—Hale-lane, Hale End Farm, 61½ a., f. and c. 6,100

Surbiton, Surrey.—4, St. Phillip's-rd., u.t. 66 yrs., g.r. 12*l.*, r. 50*l.* 410

By C. C. & T. MOORE.

St. George's East.—23, Phillip-st., and 1, Prince of Orange-court, f. 600

Stepney.—4, Heath-st., f. 425

18, Gold-st., f. 365

Homerton.—20, 22, and 24, Templar-rd., f. 1,010

58 and 60, Templar-rd., f. 600

12 and 14, Templar-rd., u.t. 45 yrs., g.r. 7*l.* 10s. 420

Limehouse.—30, West India Dock-rd., f. 450

Poplar.—6, Market-st., u.t. 27 yrs., g.r. 2*l.* 15s. .. 110

By NEWTON, EDWARDS, & SHEPHARD.

Dalston.—84 and 86, Holly-st., u.t. 7¾ yrs., g.r. 2*l.* 420

Haverstock Hill.—29, Parkhill-rd., u.t. 49 yrs., g.r. 12*l.*, r. 80*l.* 655

Finsbury Park.—50, Endymion-rd., u.t. 76 yrs., g.r. 9*l.* 9s., e.r. 52*l.* 500

Fonthill-rd., a plot of freehold building land .. 265

By STIMSON & SONS.

South Lambeth.—268, South Lambeth-rd., area 16,250 ft., f., r. 200*l.* 2,500

Streatham.—33 to 39 (odd), Wellfield-rd., f. 350

Dulwich.—3, Oakhurst Grove, u.t. 74¾ yrs., g.r. 10*l.*, r. 40*l.* 365

Clapham.—248, Clapham-rd., u.t. 34 yrs., g.r. 11*l.*, r. 65*l.* 400

Newington.—24 and 26, Penton-pl., u.t. 41½ yrs., g.r. 9*l.*, r. 72*l.* 720

Shepherd's Bush.—16, Stowe-rd., u.t. 61½ yrs., g.r. 10*l.*, r. 30*l.* 340

Wandsworth.—2, West Side, u.t. 84 yrs., g.r. 10*l.*, e.r. 50*l.* 500

Holloway.—5, Enkel-st., u.t. 59 yrs., g.r. 6*l.*, r. 32*l.* 305

Edgware-rd.—63, Salisbury-st., u.t. 19½ yrs., g.r. 4*l.* 13s. 4d. 190

November 8.—By BLAKE & DANNATT.

Peckham—8 and 10, Hanover-st., u.t. 22 yrs., g.r. 15*l.*, r. 69*l.* 535

63, East Surrey-gr., u.t. 60 yrs., g.r. 12*l.* 255

Camberwell.—33 and 34, Wilson-rd., u.t. 62½ yrs., g.r. 14*l.*, r. 84*l.* 820

5, Grace's-rd., u.t. 57½ yrs., g.r. 5*l.* 10s., r. 34*l.* 305

2, Oswyth-rd., u.t. 75 yrs., g.r. 5*l.* 5s. 310

37, Elmington-rd., u.t. 71 yrs., g.r. 5*l.* 5s. 290

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Tottenham.—4 and 5, Colina-rd., u.t. 79 yrs., g.r. 12*l.* £410
Mitcham, Surrey.—23 to 37 (odd), Fountain-rd., u.t. 78½ yrs., g.r. 22*l.* 535
By EDWARD MILLARD.
Fleet-st.—10, Wine Office-court., area 840 ft., f...
By MULLETT, BOOKER, & CO. 1,200
Bayswater.—16, Pembridge-sq., with stabling, f..
By H. E. TRAFFORD & CARTER. 4,500
Cubitt Town.—2, Pier-st., u.t. 49½ yrs., g.r. 10s., e.r. 35*l.* 230

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 12 0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1 10 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts	1 13 0	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 6 6	,,	,, ,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 4 0	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.		
Thames and Pit Sand	7 3	per yard, delivered	
Thames Ballast	6 0	,,	,,
Best Portland Cement	32 0	per ton, delivered.	
Best Ground Blue Lias Lime	25 6	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld.	rly. depôt.
Bath ,,	1 7	,,	,,
Farleigh Down Bath	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,,	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super.	at rly. depôt
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube.	deld. rly. depôt
,, ,, ,, 6-in sawn both sides landings	2	7 per ft. super.	deld. rly. depôt.
,, ,, ,, 3-in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor	11 5 0	per 1000 of 1200	at ry. dep
,, best seconds	,, 10 15 0	,,	,,
16×8 best	,, 6 2 6	,,	,,
20×10 best blue Portmadoc	10 18 0	,,	,,
16×8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green	11 2 6	,,	,,
16×8 ,, ,,	6 15 0	,,	,,
20×10 Permanent green	10 0 0	,,	,,
16×8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000	at rly. depôt
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,

PRICES CURRENT (*Continued*).

TILES.

	s. d.			
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	at rly. depot.	
Do. ornamental Do.	60 0	,,	,,	,,
Hip tiles	4 0	per doz.	,,	,,
Valley tiles	3 9	,,	,,	,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,,	,,
Hip tiles	4 1	per doz.	,,	,,
Valley tiles	3 8	,,	,,	,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 12 in.	0 10 0	more than battens.
½ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 18 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (30 ft.)	3 0 0	3 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
,, ,, 3 in. by 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, ,, 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 10 0	13 10 0
,, ,, ,, 3 in. by 9 in.	12 0 0	12 10 0
,, ,, battens	9 10 0	10 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Flitch Plates	8 10 0	9 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -

(* And upwards, according to size and gauge.)

PRICES CURRENT (*Continued*)

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe	17 0 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft.	delivered.
,, ,, fourths	2¾d.	,,	,,
21 oz. thirds	3¾d.	,,	,,
,, ,, fourths	3¾d.	,,	,,
26 oz. thirds	5d.	,,	,,
,, ,, fourths	4¾d.	,,	,,
32 oz. thirds	6d.	,,	,,
,, ,, fourths	5¾d.	,,	,,
Fluted sheet, 15 oz.	3¾d.	,,	,,
,, ,, 21 ,,	4¾d.	,,	,,
⅛ Hartley's Rolled Plate	2¾d.	,,	,,
⅛ ,, ,, ,,	3¼d.	,,	,,
¼ ,, ,, ,,	3¾d.	,,	,,

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes	per gallon	0 2 9
,, ,, ,, in barrels	,,	0 2 10
,, ,, ,, in drums	,,	0 3 0
Boiled ,, ,, in pipes	,,	0 2 11
,, ,, ,, in barrels	,,	0 3 0
,, ,, ,, in drums	,,	0 3 2
Turpentine, in barrels	,,	0 2 3
,, in drums	,,	0 2 5
Genuine Ground English White Lead	per ton	22 0 0
Red Lead, Dry	,,	22 10 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

S. S. (Amounts should have been stated). J. K.—W. D. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Waterworks	Kettering U.D.C.	H. Norwood, Surveyor, Kettering	Nov. 19
Shed, &c., Halliwell, Bolton	L. & Y. Railway Company	Engineer, Hunt's Bank, Manchester	do.
Four Houses, Great Horton, Bradford		H. E. Priestley, Architect, 17, Bertram-road, Manningham	do.
Water Tower, &c., Marton-street	Lancaster Corporation	Borough Surveyor, Town Hall, Lancaster	do.
*Asphalting and Paving Works	Hammersmith Council	Borough Surveyor, Town Hall, Hammersmith	Nov. 20
Two Houses, Llandrindod Wells		P. Morris, Architect, Llandrindod Wells	do.
Street Works, Tudor-road, &c., Moseley	King's Norton U.D.C.	Surveyor, 23, Valentine-road, King's Heath	do.
Street Works, Smith-street, &c.	Nelson (Lancs) Corporation	B. Ball, Civil Engineer, Town Hall, Nelson	do.
Street Works, Lonsdale-street, &c.	do.	do.	do.
Road Works, Eaton-road	Ilkley U.D.C.	Surveyor, Council Offices, Ilkley	do.
Sewerage Works, &c.	Newport Pagnell U.D.C.	D. Balfour & Son, Civil Engineers, 1, Victoria-street, S.W.	do.
Pavilion	Fleetwood U.D.C.	A. Frobisher, Civil Engineer, Town Hall, Fleetwood	do.
Bacteria Beds, &c., at Sewage Works, Brook-street	Brentwood U.D.C.	H. Jones, Parliament Mansions, Victoria-street, S.W.	do.
Street Works, Frances-street, &c.	Macclesfield Town Council	E. E. Adshead, Borough Engineer, Town Hall, Macclesfield	do.
Three Cottages, Canterbury	Mr. E. Layton	A. H. Steele, Architect, Dover	do.
School, Crookston	Inveresk School Board	Mr. Constable, Architect, 3, Hill-street, Edinburgh	do.
Culvert over River Avon	Rugby U.D.C.	D. G. Macdonald, Civil Engineer, Council Offices, Rugby	do.
Hotel, &c., Highroad Well, Halifax		L. Coates, Architect, Waterhouse-street, Halifax	do.
Electricity Station, Heaton Norris	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
Electricity Station, Hyde-road, Denton	do.	do.	do.
Store Premises, Lofthouse, near Wakefield	Leeds Indus. Co-op. Soc., Ltd.	J. W. Fawcett, 10, Albion-street, Leeds	do
Wood Paving	King's Lynn Corporation	Borough Engineer, Town Hall, King's Lynn	do.
Street Works, Oxford-road	Macclesfield Town Council	E. E. Adshead, Borough Engineer, Town Hall, Macclesfield	do.
Sewers, Ryhill	Hemsworth (Yorks) R.D.C.	T. H. Richardson, Surveyor, Hemsworth	do.
Road Works, York and Ross-roads	Reading Town Council	J. Bowen, Borough Engineer, Town Hall, Reading	Nov. 21
Offices	Wallasey U.D.C.	J. H. Crowther, Engineer, Great Float, Birkenhead	do.
Tramcar Shed	Lancaster Corporation	Borough Surveyor, Town Hall, Lancaster	do.
Rebuilding Ryburndale Paper Mills, Rishworth		R. Horsfall & Son, Architects, Commercial-street, Halifax	do.
Engineering Works, Milford	Stafford Corporation	W. Blackshaw, Borough Engineer, Stafford	do.
Granite Road Metal	Newmarket U.D.C.	S. J. Ennion, Deva Chambers, Newmarket	Nov. 22
Additions to Hospital, Warley, near Halifax		M. Hall, Architect, 29, Northgate, Halifax	do.
House, &c., Newbridge, near Ruabon		W. H. Johns, Architect, Llangollen	do.
Sewerage Works, &c.	Harrow-on-the-Hill U.D.C.	J. P. Bennetts, Surveyor, Harrow-on-the-Hill	Nov. 23
Two Houses, Dale-street, Askam-in-Furness	Mr. Nansen	Mr. Cowley, 10, Marsh-street, Askam	do.
Additions to Hospital, Lightburn	Shettleston (N.B.) Committee	A. Cullen, Architect, Hamilton	do.
Road Works, &c., Cwmaman, Wales		Smith & Davies, Architects, Aberdare	do.
Alterations, &c., to Chapel, Great Bentley, Essex		C. E. Butcher, Architect, 3, Queen-street, Colchester	do
*Brick Gasholder Tank	New Swindon Gas Co.	The Secretary, Gas Offices, Swindon	do
Street Works, Station-street	Middlesbrough Corporation	Borough Engineer, Municipal Buildings, Middlesbrough	Nov. 24
Additions to Asylum, Littlemore, near Oxford		County Surveyor, Oxford	Nov. 25
House, Winnington	Northwich U.D.C.	H. Bancroft & Sons, Civil Engineers, 88, Mosley-st., Manchester	do.
Sewers, &c.	Kettering U.D.C.	T. R. Smith, Surveyor, Kettering	do.
Road Works, Grange Park-avenue	Surbiton U.D.C.	Surveyor, Council Offices, Ewell-road, Surbiton	do
Granite Spalls, &c., Isleworth	Brentford Guardians	W. Stephens, Union Offices, Isleworth	Nov. 26
Infirmary	Swansea Guardians	L. Jenkins, Union Offices, Swansea	do.
Additions to Schools, Sudbrook	Portskewett (Wales) School Board	Habershon & Co., Architects, Queen's Chambers, Newport	do.
Warehouses, Nelson and Bell streets	Glasgow Corporation	Thomson & Sandilands, Architects, 241, West George-st., Glasgow	do.
*Tenement Houses, Canning Town	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	do
*Road-making and Paving Works	Willesden District Council	Engineer to Council, Public Offices, Dyne-road, Kilburn, N.W.	do
*Making-up and Paving Street	Fulham Council	Borough Surveyor, Town Hall, Fulham	Nov. 27
*Making-up Roads	Barnet U.D.C.	Surveyor, 40, High-street, Barnet	do.
*Tiling Kitchen, Prince's-road Workhouse	Lambeth Guardians	Clerk, Guardians' Offices, Brook-street, Kennington	do.
*New Coastguard Buildings, Northumberland	Admiralty	District Clerk of Works, 21, Bootham-terrace, York	Nov. 29
*Pulling Down and Clearing Site, Hornsey	The Vendors	John Farrer, Architect, 2, Coleman-street, E.C.	Nov. 30
Sewerage Works	Holmfirth (Yorks) U.D.C.	J. Barraclough, Engineer, Holmfirth	do.
Settling Tanks, Henthorne	Clitheroe Corporation	A. R. Bleavard, Church-street, Clitheroe	do.
Additions to Workhouse	Aylsham Guardians	J. B. Pearce, Architect, 15, Upper King-street, Norwich	Dec. 2
*Additions, &c., to Schools	Norton-under-Cannock (U.D.) S. B.	T. H. Fleeming, Architect, 102, Darlington-st., Wolverhampton	do.
*Lighthouse, Fog Signal House, &c., Dungeness	Trinity House Corporation	Trinity House, E.C.	do
*New Station Buildings, &c., Filton, Glos	Great Western Railway Company	Engineer's Office, Bristol Station	do.
*Extension of Electric Lighting Works	Leyton U.D.C.	W. Dawson, Town Hall, Leyton	Dec. 3
Well Boring, Public Baths, Pitfield-street, N.	Shoreditch Borough Council	H. M. Robinson, Town Hall, Old-street	do.
Refuse Destructor	Dartford U.D.C.	W. Harston, Surveyor, High-street, Dartford	do.
*Alterations, Ordnance Survey Offices, Southampton	Commissioners of H.M. Works, &c.	Survey Office, Southampton	Dec. 4
*Offices, Stabling and Tenements, Kensal-road	Wilts United Dairies, Ltd.	Pilditch, Chadwick, & Co., 2, Pall Mall East, S.W.	Dec. 5
*Erection of New Infirmary, &c.	Warwick Union	F. P. Trepess, Architect, 8, Jury-street, Warwick	do.
*Supply of Light Radiators	School Board for London	Contracts Sub-Department, School Board Offices, W.C.	Dec. 9
Enlargement of Town Hall	Wolverhampton Council	F. T. Beck, Architect, Wulfrun Chambers, Wolverhampton	do.
*Museum Building, Middlesbrough	A. J. Dorman, Esq.	J. M. Bottomley, Architect, Middlesbrough and Leeds	No date
Cottage, Courtlands Cross, Lympstone, Devon	Mr. S. Hull	E. E. Ellis, Architect, Exmouth	do.
Stable and Loft, Lympstone		do.	do.
Improvement Works at School, Macclesfield	The Managers	Jabez Wright, Architect, Macclesfield	do.
Six Houses, Lofthouse, near Wakefield		W. Wrigley, Architect, 6, Westgate, Wakefield	do.
Drainage Works, &c., Churwell, near Leeds		A. Barber, 4, King-street, Wakefield	do.
Two Villas, Ninian-road, Roath Park		C. L. Watkins, Architect, Caerphilly	do.
Calvinistic Methodist Church, Cardiff		Habershon, Fawckner, & Co., Architects, 14, Pearl-street, Cardiff	do.
Alterations to the "Brown Cow" Inn, Cardiff		Openshaw & Gill, Architects, Bury	do.
Eight Houses, Lytton-road, Girlington, Yorks		R. Drake, Architect, 31, Pearson-lane, Girlington	do.
Two Houses, Birstwith, Harrogate	Captain Greenwood	Bland & Bown, Architects, Harrogate	do.
Additions to Broadwood Cottage, Ingleton		J. Kassall, Architect, Kirkby Lonsdale	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Road Surveyor	Hackney Borough Council	156*l.*	Nov. 19
*Correspondence and General Clerk	do.	120*l.*	do.
*Junior Draughtsman and Clerk	do.	80*l.*	do.
*Assistant Lecturer in Civil Engineering	Hartley College, Southampton	120*l.*	Nov. 20
*Superintendent of Cleansing	Met. Borough of Marylebone	180*l.*	Nov. 25
*Clerk of the Works	Ilford U.D.C.	4*l.* 4*s.* per week	Nov. 26
*Surveyor	Sedgeley U.D.C.	150*l.*	Nov. 27
*Assistant Examiner in H.M. Office of Works, &c.		Not stated	Nov. 28
*Assistant Civil Engineers (2nd Grade)	H.M. Naval Establishments	Not stated	Dec. 12
*Clerk of Works	Edmonton U.D.C.	Four to Five Guineas per week	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxvi Public Appointments, pp. xix. & xxii.*

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BARLBY (Yorks).—For the construction of sewers and sewage disposal works, for the Riccall Rural District Council. Mr. E. J. Silcock, C.E., 10, Park-row, Leeds:—

J. Brunton	£4,760 15 4	T. C. Starkey	£3,630 3 6
Woodall & Woodall	4,187 10 0	Egan & Sons	3,615 4 10
Schofield, Sons, & Co., Ltd.	3,790 0 0	Arnold & Son, Doncaster	3,170 0 0
		B. Roberts	2,868 10 11

BECKENHAM.—For making-up Queen Anne-avenue, &c., for the Urban District Council. Mr. J. A. Angell, Surveyor, District Council Offices, Beckenham:—

G. Wilson	£4,491 0 0	Mowlem & Co., Grosvenor Wharf, Westminster*	£3,677 4 2
C. Pearce	4,113 12 3		
Fry Bros.	4,041 13 0		

BERKHAMPSTEAD.—For making up, &c., Doctor's Common-road, for the Urban District Council of Great Berkhampstead. Mr. E. H. Adey, surveyor, Montague-road, Berkhampstead:—

Tree & Son	£1,325 0 0	H. Williams	£1,261 13 4
Barry Building and Contracting Society, Ltd.	1,299 2 0	H. Brown	1,225 0 0
		Felkin & Watson, the Green, Southall*	1,186 18 0

[Surveyor's estimate, £1,300.]

CARDIFF.—For additions to warehouses in Millicent-street, for Messrs. John Isaac & Sons. Mr. Edgar G. C. Down, architect, 31, High-street, Cardiff:—

Thomas & Co.	£570 0	Shepton & Son	£416 10
G. Griffiths	455 0	David Davies	405 0
Lattey & Co., Ltd.	439 0	W. T. Morgan*	398 0
Knox & Wells	435 0	F. Small	390 0

CROYDON.—For the execution of street works, Onslow-gardens, &c., Wallington, for the Rural District Council. Mr. R. M. Chart, Surveyor, Town Hall, Croydon:—

Onslow-gardens.

T. Adams	£3,193	W. Langridge	£2,488
Practical Landscape Gardening Co.	2,985	E. Iles, Mitcham and Wimbledon*	2,471
W. H. Wheeler	2,567	Lawrence & Thacker	2,460
Free & Sons	2,510		

Springfield-road.

T. Adams	£493	W. Langridge	£371
Practical Landscape Co.	450	W. H. Wheeler	352
Free & Sons	400	E. Iles*	318
C. J. Burnand	385	Lawrence & Thacker	303

DEVONPORT.—For alterations to and rebuilding part of the King's Arms, George-street, for Mr. J. Martyn. Mr. Edgar M. Leest, architect, 14, St. Aubyn-street, Devonport:—

	Cement Front. £ s. d.	Glazed Terra Cotta Front. £ s. d.
Jenkin & Son	1,433 0 0	1,787 10 0
A. M. Coles	1,327 0 0	1,671 0 0
J. Quick	1,305 0 0	1,651 0 0
J. Coles	1,313 0 0	1,627 0 0
W. G. Goad	1,284 10 0	1,615 15 0
T. May, Plymouth*	1,288 0 0	1,615 0 0
J. Fiell	1,277 13 1	1,593 18 0
F. Gillard	1,224 18 8	1,567 4 9

FROXFIELD (Hants).—For the erection and completion of a gamekeeper's house, for Mr. J. Silvester. Mr. E. Arden Minty, architect, 39, Victoria-street, Westminster:—

Pocock Bros.	£644 0	J. Hayes, Hawkley*	£384 0
W. Brading	420 17		

HILL BROW (Hants).—For small addition and redecoration, painting, &c., at Lingwood, for Mr. H. Granville Sharp. Mr. E. A. Minty, architect, Westminster:—

E. Finch	£227 0 0	W. Brading, West Liss	£118 5 3
J. Holder	119 0 0		

HOUNSLOW.—For making-up, kerbing, &c., two new roads, Harlington, for Mr. Robert Newman. Mr. G. W. Manning, surveyor, London-road, Ashford, Staines:—

J. Macklin	£1,200 0	W. H. Wheeler	£717 0
Killingback & Co.	1,050 0	Felken & Watson	697 3
A. Green	927 0	Mott & Sons	625 12
S. Kavanagh	883 0	G. Hebburn, Hersham, Surrey*	567 0
R. W. Swaker	754 0		

HOVE.—For new street works for the Town Council. Mr. H. H. Scott, Borough Surveyor:—

Caburn-road.

Parsons & Sons, 118, Church-road, Hove* .. £293

New Street Works in Rutland Gardens.

W. A. McKellar, 1, Langdale-road, Hove* £1,741

ILKLEY.—For the supply of granite, road metal, &c. (1,000 tons), for the Urban District Council. Mr. Thomas H. Smith, surveyor:—

		per ton. s. d.
Leonard Cooper, Central Bank Chambers, Leeds*	Granite macadam	8 10
	Granite sand	7 0

[And ten other tenders.]

LEICESTER.—For the construction of 850 lineal yards of 6-in. Hassall's single-lined stoneware pipe sewer, together with flushing-chamber, manholes, lampholes, and other works in connexion therewith, for the Parks and Recreation Grounds Committee. Mr. E. Geo. Mawbey, Borough Engineer and Surveyor, Town Hall, Leicester:—

Jewell	£483 7 2	T. Philbrick	£323 8 2
Stimpson & Rollestone	437 12 0	H. Mason	320 15 7
J. Holme	391 3 0	J. H. Smedley, Battenberg-rd., Leicester*	299 2 8
Johnson & Langley	338 12 4		

LONDON.—For the erection of a receiving house and cottages for children on the Newlands, Peckham Rye, S.E., for the Guardians of St. Giles', Camberwell. Mr. A. E. Mullins, architect, 16, Church-street, Camberwell Green, S.E.:—

Foster Bros.	£14,882 0 0	Tomkins	£12,836 11 7
Holliday & Greenwood	13,735 0 0	Gibb & Co.	12,709 0 0
G. Parker	13,480 0 0	Courteney & Fairbain	12,599 0 0
W. Reason	13,463 0 0	C. Ansell	12,500 0 0
Burman & Sons	13,200 0 0	Holloway	12,442 0 0
Parnell & Co.	13,059 0 0	Vogel Goad	12,385 0 0
Sharpington	12,998 0 0	Balaam Bros.	12,112 0 0

LONDON.—For alterations and additions to laundry premises in rear of 16 and 18, Queen's-road, Peckham, for Mr. C. D. Cocks. Mr. A. E. Mullins, architect, 16, Church-street, Camberwell Green, S.E.:—

Burman & Sons	£1,205	G. Parker	£1,025
Balaam Bros.	£1,190		

LUTON.—For the execution of paving works, &c., Moor-street, and others, for the Town Council. Mr. A. J. L. Evans, C.E., Borough Surveyor, Town Hall, Luton:—

Moor-street.

Free & Sons	£471 6 0	G. Powdrill	£419 0 0
Patent Victoria Stone Co.	464 0 0	G. W. Pryer, Luton*	385 0 0

Crawley-road.

Free & Sons	£171 14 0	G. Powdrill	£162 0 0
Patent Victoria Stone Co.	166 0 0	G. W. Pryer*	138 0 0

Reachs-street.

G. Powdrill	£634 10 0	Patent Victoria Stone Co.*	£618 11 8
Free & Sons	623 4 8		

Tennyson-road.

Free & Sons	£214 0 0	G. Powdrill *	£188 0 0

Harcourt-street.

G. Powdrill	£610 6 0	Patent Victoria Stone Co.*	£578 17 6
Free & Sons	586 18 6		

MANCHESTER.—For the erection of two houses, Ashton Old-road, Fairfield, for Mrs. M. Holt. Messrs. C. K. & T. C. Mayor, architects, 41, John Dalton-street, Manchester:—

E. & C. Jackson, Old-lane, Higher Openshaw* .. £1,450

NEWRY (Ireland).—For rebuilding the workhouse for the Guardians. Mr. John Brown, architect, Newry. Quantities by architect as to approximate cost in building:—

T. McDonald	£6,800	McAllenam	£4,778
D. Mahood	5,350	A. Wheelan, Newry*	4,749
J. McKee	4,981		

NORTHFLEET (Kent).—For the execution of wood paving works for the Urban District Council. Mr. S. Honeycombe, Council Offices, The Hill, Northfleet:—

Griffiths, Winchester House, Bishopsgate, 15s. per yard.

SHEERNESS.—For the following, for the Sheerness Urban District Council: (1) quartzite, 200 yds.; (2) good clean pit flints, 300 yds., both broken to pass through a 2-in. ring; (3) good clean hoggin (for binding purposes), 200 yds.; (4) indurated stone slabs, 2 in. thick, about 600 yds. super. Mr. T. F. Berry, Surveyor:—

	s. d.
Road Maintenance and Stone Supply Co., Ltd., Gravesend* quartzite, per yd.	12 6
Wills & Packham, Ltd., Sittingbourne* flints	3 10
hoggin	2 3
Patent Victoria Stone Co., Ltd., London* paving slabs	4 1
W. Griffiths & Co., Ltd., London quartzite	15 6
Exors. of W. Wood, Milton, Kent flints	3 10
" hoggin	3 6
Smeed, Dean, & Co., Ltd., Sittingbourne flints	3 10
" hoggin	3 0
H. Cremer, Oare, Faversham flints	3 10
" hoggin	2 8
R. Cornford, Milton flints	4 2
" hoggin	3 2
W. S. Harnett, Newington, Sittingbourne flints	4 3
Burgess, Burgess & Co., London paving slabs	4 5
W. Clark, Ospringe, Faversham flints	4 7
" hoggin	4 0
L. Sommerfeld, London quartzite	12 9
Fry Bros., Greenwich flints	4 0
" hoggin	2 9
Quartzite Co., Ltd., London quartzite	12 8
J. Runnals, Penzance paving slabs	4 6
Burley & Son, Sittingbourne flints	3 10

SHEERNESS.—For erection of toll houses at Sheerness Pier. Mr. T. F. Berry, Surveyor:—

J. Brown	£396	J. R. Bligh, East-church, Sheerness*	£347
J. Lodder	379		
C. F. Hughes	378		

[Surveyor's estimate, £378.]

THORPE-LE-SOKEN (Essex).—For additions to Rolph Schools, for the Committee. Mr. C. E. Butcher, architect, 3, Queen-street, Colchester:—

F. C. Thurman	£1,099 10	T. J. Ward	£871 0
Gooch & Co.	985 5	A. Diss	850 0
T. C. Canham	968 0	Dupont & Co.	838 0
Pennick & Taylor	935 0	H. Potter	835 0
C. Mills	930 0	Jas. McKay, Clacton-on-Sea‡	807 0
C. West	894 0		

‡ Subject to variations.

UPTON PARK.—For the erection of two blocks of buildings on a site at Carter-road, Plaistow, E., comprising pupil teachers', laundry, and cookery centres, and caretaker's house, for the West Ham School Board. Mr. William Jacques, Architect to the Board, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Sons:—

A. E. Symes	£26,111	G. Sharpe	£22,055
B. E. Nightingale	24,901	W. J. Maddison	21,615
Stimpson & Co.	22,537	A. Reed	21,220
Battley, Sons, & Holness	22,319	Gregar & Son, Stratford†	21,159

WELLINGBOROUGH.—For supplying and laying concrete flags, &c., Midland-road, for the Urban District Council. Mr. E. Sharman, surveyor, Market-square, Wellingborough:—

	Per yard laid. s. d.
W. Stevens (Keswick)	5 0
" (Ellis)	4 10
Victoria Stone Co.	4 10
Croft Granite Co.	4 9
Ellis & Sons, Leicester*	4 6
Empire Indurated	4 6
G. F. Thompson	4 6
Abell & Cammell	4 3

WEST HAM.—For the erection of forty double tenement houses, Eve-road, Plaistow, for the Town Council. Mr. J. G. Morley, Borough Engineer:—

F. & E. Davey	£23,885 0 0	Herbert Bros.	£18,129 0 0
General Builders, Ld.	21,797 0 0	Haines & Co.	17,635 19 2
F. G. Minter	21,591 0 0	Gregar & Son	17,580 0 0
Martin Wells & Co.	20,850 0 0	G. Wise	16,899 0 0
Thomas & Edge	20,314 0 0	Barker & Co., Ltd.	16,320 0 0
J. W. Jerram	18,678 0 0	H. J. Carter, Grays*	15,740 0 0

WREXHAM.—For the erection of school buildings, Brynteg, for the Broughton School Board. Messrs. Lockwood & Sons, architects, 80, Foregate-street, Chester:—

	For New Schools.	For Alterations.
T. Williams	£3,899 19 0	£1,509 7
W. E. Samuel	3,600 0 0	1,380 0
R. Williams	3,498 14 6	1,281 12
Davies Bros.	3,385 0 0	1,317 0
W. H. Wycherley, Broughton, near Wrexham*	3,179 0 0	1,199 0

YORK.—For the execution of street works, Back Markham-crescent, &c., for the Corporation. Mr. Alfred Creer, City Engineer, Guildhall, York:—

C. Martin, Longfield-terrace, York* .. £730 17 8

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's architect:—

* *Recommended for acceptance.*

ALEXIS-STREET.—Improvements — Providing new halls for each department, 38 ft. by 25 ft. New drawing classroom, area 1,120 ft. super. New cloakrooms, lavatories, and stock and teachers' rooms for each department. Providing one new internal water-closet for teachers. New staircases for boys and girls. New heating-chamber and coal-store in basement. New coal-lift from basement to second floor. New kindergarten gallery in babies' room, and redividing and restepping centre classrooms in each department. Enclosing, draining, and tarpaving the additional land. Heating by open fires and low-pressure hot-water apparatus. Revised accommodation:—boys, 378; girls, 376; infants, 424; total, 1,178: net loss of 109 places:—

McCormick & Sons	£13,786 0	Marsland & Sons	£13,035 0
F. & H. F. Higgs	13,649 0	Chessum & Sons	12,999 2
W. Downs	13,386 0	Clarke & Bracey	12,583 0
		Treasure & Son*	12,188 0
		T. L. Green	11,292 0

ENNERSDALE-ROAD SCHOOL.—Enlargement by 414 places. Providing three new classrooms—50, 48, 40 for each department; new staircases for boys and girls; additional cloakrooms for each department; extending corridor on each floor, and providing new entrance to main building for infants:—

W. Downs	£8,424	J. & M. Patrick	£7,049
Kirk & Randall	8,236	Smith & Sons, Ltd.	6,962
F. & H. F. Higgs	7,803	J. & C. Bowyer	6,897
Johnson & Co.	7,752	Johnson & Co., Ltd.	6,730
T. D. Leng	7,548	Treasure & Son, London and Shrewsbury*	6,654
Bulled & Co.	7,379		
Garrett & Son	7,355		
Holliday & Greenwood, Ltd.	7,290		

[See also next page.

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HEAD OFFICES (I.S. Department).—Providing a cupboard and converting a single desk into a double desk :—

Spencer & Co....	£112	19	4	London School Furniture Co.	£65	9	0
H. Bouneau....	105	0	0	Wake & Dean, Ltd *.....	61	10	0
T. Cruwys ...	94	0	0				
Hammer & Co., Ltd.	92	0	0				

NORTHWOLD-ROAD.—Providing and fixing complete low-pressure hot-water apparatus to three halls ; also to eighteen classrooms (ground, first, and second floors), drawing classroom, cloakrooms, corridors, and lavatories :—

Cannon & Sons....	£795	0		Brightside Foundry and Engineering Co., Ltd.	£669	0	
Dargue, Griffiths, & Co., Ltd.....	765	13		G. & E. Bradley ..	615	0	
Wenham & Waters, Ltd.	708	0		Knight & Sons	594	0	
J. & F. May.....	690	0		J. C. Christie.....	555	0	
Oldroyd & Co., Ltd.	670	0		Duffield & Sons ..	500	0	
				Defries & Sons, Ltd.	490	10	

SCARSDALE-ROAD, ESSEX-STREET, and MARNER-STREET.—Repairs to furniture :—

	Scarsdale-road.			Essex-street.			Marner-street.		
	£	s.	d.	£	s.	d.	£	s.	d.
H. Bouneau	38	10	0	105	19	0	29	3	0
T. Cruwys.....	35	17	6	108	0	0	31	6	0
R. H. Galbraith, General Builders, Ltd.....	37	19	9	99	4	0	31	19	8
Hammer & Co., Ltd.....	39	0	0	99	0	0	35	0	0
London School Furniture Co..	*28	7	0	*80	0	0	*24	1	6
Waring & Gillow, Ltd.....	32	4	6	86	4	3	28	11	6
	44	2	0	113	8	0	42	0	0

SUMMERFORD-STREET.—Repairing nine stoves.
BREWHOUSE-LANE.—Repairing six stoves :—

Contractors.	Summerford-street.			Brewhouse-lane.		
	£	s.	d.	£	s.	d.
Landers, Ltd.....	57	0	0	—		
Wontner-Smith, Gray, & Co.....	51	0	0	34	0	0
Cannon & Sons	49	10	0	33	0	0
Hendry & Pattisson, Ltd.	21	5	0	16	10	0
Coules & Son.....	24	18	6	17	10	0
J. Bond	22	10	0	15	0	0
Rockhill Bros.	*18	0	0	*12	10	0

SUMNER-AVENUE (P.T. Centre).—Providing and fixing fittings in science-room :—

H. Bouneau .....£	190	0		General Builders, Ltd. £	149	0
Spencer & Co.	175	0		London School Furniture Co.*.....	120	6
Hammer & Co., Ld.	163	0				

Supply of church oak varnish and vermillionette, on a running contract :—

	Varnish, per gallon.			Vermillionette, per lb.		
	s.	d.		s.	d.	
Atkins, Bussell, & Co.....	5	6	.....	0	6	
Blundell, Spence, & Co., Ltd.	5	6	.....	0	6	
Davis Bros.....	*5	6	.....	*0	6	
T. & W. Farmiloe, Ltd. ..	6	0	.....	0	4	
H. E. Kershaw.....	6	6	.....	0	9	
Nicholls & Clarke, Ltd.....	9	0	.....	1	0	
Wilkinson, Heywood & Clark, Ltd.	7	9	.....	0	4	

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WOODEN BUILDINGS,
Bank, Office, & Shop Fittings,
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The Builder.

VOL. LXXXI.—Nr. 3068. NOVEMBER 23, 1901.

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View from St. James' Park, and Plan ..... By Mr. Ernest George, F.R.I.B.A.
House at Barnt Green, Worcestershire ..... Messrs. Bateman & Bateman, Architects.
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Trade Arbitration at Home and Abroad.

THE ordinary daily journals are supposed to supply their readers with all the constantly occurring facts of our national life, so that they may know accurately the true course of events. But the want of proportion in journalistic presentment is often the cause of misunderstanding. If, for example, a strike of any importance occurs, it fills the news columns of the Press day after day, so that the public are impressed with the belief that labour disputes are long and bitter. Those cases in which differences between employers and workmen happen, and are quickly and amicably settled by conciliation or arbitration, are scarcely noticed. Differences of this kind there must always be, for bodies of men with adverse interests are no more likely to agree than are individuals in the same position. But though this fact is patent, it is not so obvious that there are many amicable settlements; if, however, we survey the trade world at home and abroad we shall find that masters and men, although they may differ, are constantly settling these differences by arbitration. If, for instance, we take the building trade, we find during the year 1900 that there were 146 disputes, affecting over sixteen thousand persons; of these forty-six were compromised, fifty ended in favour of the workpeople, and forty-seven in favour of the employers—figures which seem to show that the disputes were not unreasonable, since neither masters nor men had a preponderating gain by them. This is not surprising when it is borne in mind that, of the total number of disputes, no less than ninety-seven arose in regard to wages, a subject which it is as easy to differ over as the price of a house. All these figures are interesting and suggestive, but none are more so than those in regard to the amicable settlements of disputes. If we take all the disputes which have occurred throughout Great Britain we find that they number 648 for the year, of which 519 were settled either by arbitration, conciliation, or negotiation. "The great bulk," states the Board of Trade, "of the disputes of the year were ultimately settled by negotiation between the parties directly concerned or their representatives. Thus of the total of 648 disputes three-fourths were so arranged, and these embraced 82 per cent. of all the persons concerned in the disputes of the year, as against 87 per cent. for the previous year."* The difference is immaterial, the main fact being that a number of trade differences are settled in this manner. Some of these negotiations, of course, lasted for a long time, and if arbitration or conciliation had been employed, the end would, doubtless, have come earlier, for of the total number of disputes thirty-two were settled by this means. But it must not be supposed that these negotiations were ended after a long struggle, though it is equally certain that many of these differences would have been as satisfactorily and more quickly settled by arbitration.

If, however, we return to the question of disputes in the building trade, it is interesting to look a little more in detail into the twenty-four disputes which arose in the trade between July, 1899, and June, 1901. Of these sixteen were settled under the Act of Parliament. We find, for instance, that there was a dispute in May of the present year between the Amalgamated Society of Gasworkers, Brickmakers, and General Labourers and the Cheltenham Master Builders' Association, the former demanding an increase for all labourers from 5d. to 6d. per hour. Mr. A. A. Hudson was the arbitrator, and he refused the demands of the men. It is obvious that the moment a contest of this kind arises it should be settled by an impartial person. Nothing can be more absurd than an industrial battle, ruinous to all parties, about it. The same fate attended an attempt of the Staffordshire painters to obtain a rise of the standard wages from 7½d. to 8½d. In this case Mr. Blashill was arbitrator. The Board of Trade could not have made better selections of arbitrators, for Mr. Hudson has considerable judicial work as one of the Tribunal of Appeal under the London Building Act, and all our readers are familiar with Mr. Blashill's name. It also shows the value of the Conciliation Act of 1896 that both sides in a dispute can now refer to the Board of Trade to appoint an architect. Private persons have their disputes settled by a judge, and trade bodies have now a tribunal to which they appeal at once. It is also to be noted that London, Liverpool, Bristol, Birmingham, Macclesfield, Halifax, Wakefield, and Dewsbury have each a District Board of Conciliation—a fact which shows that, however inevitable trade disputes may be, there is also growing up the means of settling them in an amicable manner.

These official arbitrations also fulfil another purpose: they can bring the parties together without a formal award—a still more satisfactory manner of terminating a dispute. Thus there was a dispute between the builders' labourers and the employers of Reading, and Mr. Hudson's good offices were again called in. But, he says in his report, "after some discussion I was able to bring the parties to terms, and I enclose a copy of the agreement which I drew up and they signed and exchanged. There was therefore no need for me to make an award." That agreement embodied an advance of wages of from 5d. to 5½d. per hour, but it is evident that all that was needed to end the dispute was a reasonable discussion of it, presided over by an impartial person who could keep it within bounds and prevent harsh or intemperate language. When, also, we look at the agreements made between employers and workmen, we find evidence of the same reasonable spirit. Thus in the agreement of April, 1899, made between the Master Builders' Association and the Carpenters' and Joiners' Societies of Wigan and District, Rules XIV. and XV. practically enact that disputes shall be settled by arbitration. If a change is desired in the rules, a deputation of five working joiners shall meet the same number of employers, and if they fail to come to an understanding, the matter shall be referred to the Board of Arbitration, which is to consist of a body of five working men and five employers. This board is that which primarily settles all disputes between the employers and workmen, and should they not agree, which, of course, is unlikely, then the question as to the change in the rules or the trade dispute is to be referred to an umpire or sole arbitrator to be agreed on, and in case of disagreement to be nominated by the

* Report of the Chief Labour Commissioner on the Strikes and Locks-out of 1900-1901.
Third Report of the Board of Trade of Proceedings under the Conciliation (Trade Disputes) Act, 1896 1901.
Second Abstract of Foreign Labour Statistics, Board of Trade Labour Department, 1901.

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Board of Trade. It must be confessed that the step of having a board of arbitrators might well be dispensed with, and time would be saved by going at once to a single umpire. But we are not concerned now with the wording of rules, it is rather with the spirit which inspires them. And we are fairly entitled to say that while it is evident there must in the near future be many trade disputes, there is equal certainty that many will be settled by arbitration or conciliation.

If we turn to the Continent and to America, we shall find in both places inevitable trade disputes and fortunately also a growing tendency to the less brutal methods of concluding them. If we glance, for example, at Germany, where so much energy and vitality is visible in all forms of trade, we find that in the year 1896, the last for which statistics are as yet supplied, there were forty-four applications for the intervention of the Industrial Courts. In France, in 1889, there were 740 strikes, and of these 197 were settled by the operation of the law of 1892; in seventy-nine cases the parties, one side or the other, refused arbitration or official conciliation; and further, in forty-two cases disputes were settled by conciliation committees. If we cast our eyes across the Atlantic we find that in the State of Massachusetts in the year 1896 the latest to which the statistics are as yet available, there were 100 trade disputes recorded, of which thirty-nine were submitted to the State Board of Arbitration and Conciliation, and that of these, nineteen disputes were in the building trade. These figures are not very large, and are infinitesimal compared to the total figures for the whole of the United States, which one day we hope may be presented to the English public. But they are sufficient to indicate the direction of the wind, and together with those from France and Germany they show that there is among masters and workmen a considerable spirit of reasonableness, which one may fairly hope may become more marked the further we advance into the new century.

SEWAGE AND SEAWEED.

THE Clyde at Glasgow and the Liffey at Dublin have long had the unenviable notoriety of being the most evil-smelling river-mouths in the United Kingdom. The sea-approach to Belfast during the summer and early autumn is even worse, and it is not surprising that the Corporation of this flourishing city has found it necessary to attempt a mitigation of the nuisance. The problem at Belfast is peculiar in that the nuisance is not directly caused by the flow of sewage into the lough, but is due to the decomposition of vast quantities of a particular seaweed, the "sea-lettuce" (*Ulva latissima*), which flourishes in the upper reaches of the lough, and during high winds is washed ashore, forming banks 2 ft. or 3 ft. thick and miles in length, and there putrefies, the result being an intolerable stench. As the weed has some value as a manure, part of it is carted away for the use of farmers, but the quantity thus removed is very small in comparison with the amount cast up by the sea. At Holywood—about four miles from Belfast, on the south shores of the lough—an attempt is made to remove it as quickly as it is deposited, but obviously this method would be very costly if applied to the whole of the foreshores over which the nuisance extends, and to prevent the extraordinary growth of the weed would undoubtedly be a better solution of the problem.

With this end in view, the Corporation instructed Dr. E. A. Letts, Professor of Chemistry in the Queen's College, Belfast, to prepare a Report on the proposed scheme of sewage purification, and its probable effects on the lough. This Report, which (somewhat curiously) is not dated, but which contains experiments on samples of sewage and effluents collected between January 6 and June 7 of this year, now lies before us. Dr. Letts shows (we think conclusively) that the occurrence of the sea-lettuce in large quantities in any locality is associated with the pollution of the sea water by sewage. The first ground for this opinion is the large proportion of nitrogen which the weed contains—more than 6 per cent. of the dry weight. The second is furnished by practical observation of the conditions under which it flourishes. In former times Belfast Lough was comparatively free from the sea-lettuce; it appears to have increased with the growth of the city. At the present day Strangford Lough, which is not far from Belfast Lough, but which differs from it in having no large town on its shores, is almost free from the weed. The case of Dublin Bay is particularly significant. The upper reaches are divided by the Pigeon-house wall (more than a mile and a half in length) into a northern and southern portion. The northern portion receives the sewage of the city and the sea-lettuce flourishes abundantly. The upper reaches of the southern portion are unpolluted and are free from the weed, but this is found again at Blackrock and Kingston on the south shore in the neighbourhood of their sewage outfall. Dr. Letts's third reason is based on actual experiment with the weed in samples of polluted sea water. He found that about 50 per cent. of the ammonia in the polluted water was absorbed by the weed in one hour, and nearly the whole of it in five hours.

This led naturally to another series of experiments. The purification of sewage effects a large reduction in the free ammonia, and thus reduces one kind of food which can be assimilated by the sea-lettuce. The question remained whether the albuminoid matters in the sewage effluent would, on dilution with sea water, change rapidly into ammonia or nitrates, both of which contribute to the growth of the weed. Experiments showed that the change was very slow, and Dr. Letts concludes that "their effect on the growth of the *Ulva latissima* may be disregarded." The purification of the sewage of Belfast may, therefore, reasonably be expected to remove some at least of the conditions which cause the sea-lettuce to flourish so abundantly.

The second half of the Report is said to deal with "the scheme of sewage purification proposed for Belfast." It really consists of an investigation of the degree of purification effected by four experimental contact-beds. The sewage is pumped into a storage reservoir, from which it is normally allowed to escape at the ebb tide. The contact-beds are fed from the storage reservoir, and are in two pairs, each pair consisting of an upper and lower bed. The sewage passes through one upper and one lower bed in six and a half hours as follows:—Filling upper bed, three-quarters of an hour; upper bed resting full, two and a half hours; emptying upper and filling lower bed, three-quarters of an hour; lower bed resting full, two and a half hours. The beds are 3 ft. 6 in. deep, one upper and the two lower beds being filled with broken bricks, and the other upper bed with coke, all the pieces being about the size of a hen's egg. The purification effected is less than that obtained in the experiments at Leeds, and very much less than that obtained at Manchester by the open septic-tank and double contact, and Dr. Letts thinks it "worth while to try the effects of septic tank treatment on the sewage previous to that of the bacteria beds." Certainly, the more experiments that are made the more surely will the foundations of the science of sewage purification be laid. Further experiments with different materials in the contact-beds would also prove interesting. The two beds of broken bricks gave better results than the other pair, which consisted of one bed of coke and one of brick. The second beds might advantageously be formed with much smaller material.

In addition to the usual analyses Dr. Letts has ascertained the nature and quantities of the dissolved gases in the sewage and first and second effluents. This is almost a new departure, and gives promise of interesting results. During the process of purification a considerable proportion of nitrogen disappears. Dr. Letts considers that a good deal of this may escape into the air as free nitrogen, while another portion is absorbed by insects, worms, and plants. The bacteria-beds must be regarded therefore "more as *dispersers* of nitrogen than as mere *converters* of it into simpler compounds."

It is somewhat strange that in the preliminary section on "The Methods of Sewage Disposal" Dr. Letts does not draw attention to what may be termed "percolating filters." In these the sewage after partial purification passes downwards in thin films or drops, the filters never being filled with sewage as in the case of contact-beds. The result is more thorough aëration and a higher degree of purification. Of course, the necessity for a high degree of purification is not as great at Belfast as in inland towns.

Dr. Letts's Report is undoubtedly an interesting contribution to the subject of sewage disposal, and adds something to the common stock of knowledge. The part dealing with the relation between sewage and seaweed is more conclusive than that treating of the method of sewage disposal. The analyses of the sewage and effluents were vitiated by the entrance of sea water into the contact-beds or by other causes, the amount of chlorine in the effluents being generally greater than in the settled sewage; on the other hand, in a few cases the chlorine in the effluents was less than in the settled sewage; in only one instance was the original quantity maintained.

NOTES.

London Water.

MR. LONG'S speech on Monday, in which he referred to the question of the London water supply, indicates very clearly the policy of the Government on this subject. They will

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certainly introduce a Bill to constitute a public water authority for London and the immediately surrounding districts. Whether in a Session which is certain to be abnormal they will carry this measure through is quite another thing. This authority will have powers of rating, and the price to be paid to the companies will be assessed by what the President of the Local Government Board euphemistically calls a distinguished tribunal. Whether or not the public or the companies benefit by such arbitration, it is evident that there is a good thing in store for the lawyers. Mr. Long seems to think it is not altogether certain whether the House of Commons will accept the creation of an authority, not directly elected by the ratepayers, which shall have the power of levying money. Such a body would probably be just as economical as a directly elected body, but in these days it is doubtful if the theoretical objection to such a body will not be too strong. Representation and taxation are the watchwords of a democracy, and if the people are extravagant, that is their fault. However, time will show the public view on this point. At any rate, we now know the general scope of the promised measure. When it is introduced into Parliament the details will be given. It has also to be borne in mind that the Government have already on this subject tried and failed, and that was when they were in a much stronger position than they are to-day. We cannot, therefore, honestly expect much success in the coming Session.

The Bricklaying Trade.

UNDER the title of the "Crisis in British Industry," the *Times* on Monday last published a striking article on the manners and customs of the bricklayer of to-day. The gist of this article was that the bricklayer at the present time lays about half the number of bricks that he used to do, so that the cost of labour is just about doubled. He does this in order to make work for a larger number; in other words, he is a Socialist at the expense of the public. His action prevents individual industry; it keeps every man at the same level of earning power. If a man tries to earn more by strength or sustained labour he is regarded as a blackleg by his unionist companions, and life is made disagreeable to him. These facts, which we have merely summarised, are set forth at length in the article above mentioned, and chapter and verse is given for them. They merely state, however, in a popular form what is already known to many of our readers, though the subject is treated in a definite manner. What remedy there is for this state of things it is impossible to say; for when men work in gangs at manual tasks the power of the majority to repress industry is very great, and as long as there is capital to draw on, the power of the workman to act as he is now doing continues. It is to a certain degree a question of supply and demand. In a poor country it would be impossible for the general public to bear the cost.

A Proposed American Building in London.

THE daily papers have been publishing rather sensational statements in regard to a proposed immense block of building, of the American steel-frame and facing type, to be erected on the north side of the Strand, at a cost of two millions. This, as the statements come from an American source, probably means dollars, though the newspapers give it as pounds sterling. The information in regard to the forward state of the scheme must be rather premature, at all events, since we found on inquiry that the architect's department of the London County Council knew nothing whatever of it, and such a building could certainly not be erected in London without a special application for suspension of by-laws as to height, &c.

Railway Charges.

WE are so constantly being told of the superiority of American methods of railway working, that it is almost startling to read such remarks as the following, which were recently made by the president of a great trade convention in the United States: "In passenger transportation we are hemmed in with a lot of rules and regulations that seem unnecessary. In freight transportation matters are even worse. The many changes in classifications and tariffs have built up a system so complex, that it is almost necessary to educate a person specially to follow the many ins and outs of tariff sheets and freight matters generally." Clearly there is room for improvement elsewhere than in the old country. The rates and charges agitation of a few years back, the progress of which was closely followed in these columns, proved that we were in need of education on this question; and eventually resulted in the adoption of a uniform and intelligible classification. It is a matter for congratulation that we are not subjected to the sudden and arbitrary fluctuations of which American traders complain so strongly.

The Mond Gas Act.

THE South Staffordshire Mond Gas (Power and Heating) Company's Act was issued by the printers on Monday last. This Act, as our readers will remember, confers upon the company power to supply gas for heating and power purposes to a number of towns in South Staffordshire and East Worcestershire at a maximum price of 3d. per 1,000 cubic feet to consumers requiring not less than 16,000,000 cubic feet per annum, and 4d. per 1,000 cubic feet to consumers requiring less than this quantity. Some of the most noteworthy provisions of the Act are—(1) the minimum heating value of the gas is fixed at 125 British thermal units per cubic foot; (2) the gas must never contain more than 14 per cent. of carbon monoxide; (3) the Act does not confer upon the company any monopoly or exclusive right to supply gas within the districts mentioned; and (4) if any consumer uses the gas for lighting purposes the company is to cut off his supply. This is the first occasion upon which standards for heating power and carbon monoxide have been introduced into any gas Act in this country, but as illuminating gas supplied by other companies is now very largely used for heating purposes, we trust that it will be made a precedent for future Acts. Mond gas contains about 50 per cent. of incombustible nitrogen, and we are of opinion that the supply of water-gas at double the price would be of greater utility to the community in general, for water-gas is wholly combustible and of twice the heating value of Mond gas. The multiplication of companies vested with power to open public thoroughfares is to be deplored, but the supply of a cheap, smokeless fuel for both domestic and industrial purposes has become a matter of vital importance. When an existing gas company suggests a reduction in the illuminating power of the gas, with a proportionate reduction in the price, the company is at once suspected of endeavouring to snatch an advantage at the expense of the consumer, and probably no company other than one appearing as a thinly-disguised competitor would have received public support. A cheap mixture of coal-gas and water-gas, having a comparatively high heating value, eminently suitable for incandescent lighting, and capable (like methane) of being consumed without admixture with air before the point of ignition with either a non-luminous flame or a flame of feeble luminosity, would, we believe, best meet the requirements of present-day consumers, and would render it unnecessary to put down a second set of gas mains.

Testing Electrical Accessories.

THE suggestion made by Mr. Wordingham to the Institution of Electrical Engineers, that it should undertake the work of testing electrical accessories and fittings, seems to us to be an excellent one. The increased pressures of supply now in general use make it imperative, both in the interests of consumers and manufacturers, that only certified articles should be used in electric circuits. We had occasion recently to test a small switch which controlled five 16 c.-p. lamps on a 240-volt circuit. When it was pushed smartly down it broke the circuit satisfactorily, but on breaking the circuit slowly the arc set up destroyed the switch. In our opinion this switch, which is of a fairly common type, ought never to have been put in the circuit. With 240 volts the fittings need to be of very much better material and much more carefully designed than when 100 or even 200 volts is the pressure employed. An ordinary 100-volt 5-ampère switch only breaks a 240-volt circuit when the arc set up has melted most of the metal inside the switch. Another point that has now to be considered in connexion with switches is the insulation resistance of the base of the switch. There may be nothing to choose apparently between two switches, and yet the insulation resistance of one may be so low that, if it is fixed in a cellar, for example, it will lower the resistance of the whole wiring so much that the supply company will refuse to connect the installation to its mains. The other switch may have an insulation resistance so high that it is practically impossible to measure it. If the Institution started a testing laboratory for electrical accessories, something similar, for example, to the meter-testing laboratory of the Board of Trade, then we are sure manufacturers would gladly avail themselves of the opportunity of enhancing the value of their wares by getting them officially approved. Architects would have more confidence in specifying electrical fittings for their clients if they knew that these fittings had been certified as suitable by an independent authority.

Incrustation on St. Paul's Cathedral.

IN the "Proceedings" of the Chemical Society issued on the 16th inst., there appears a note by Mr. E. G. Clayton "On an Incrustation from the Stone Gallery of St. Paul's Cathedral." Reference is made to an in-

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crustation present on the balustrade of Portland stone erected around the Stone gallery which, upon analysis, was found to consist mainly of hydrated sulphate of lime. Mr. Clayton is apparently surprised at the result, and indulges in speculation as to how such a deposit came to be formed upon a stone consisting mainly of carbonate of lime. "After a careful consideration of all the circumstances, and especially the characteristic appearance of the incrustation, it is suggested that the presence of the main component is principally due to two centuries' solvent and weathering action of rain, charged with sulphurous and sulphuric acids derived from the gases and smoke of innumerable surrounding chimneys." Had Mr. Clayton consulted a paper communicated by Dr. Voelcker as long ago as the year 1864 to the Society of Arts, he would have discovered that the composition of this incrustation closely approximated to those of similar incrustations examined by Dr. Voelcker, who also showed that ordinary soot contains sulphate of ammonia, and that this sulphate of ammonia converts carbonate of lime into sulphate of lime, which in the presence of moisture "takes up water of crystallisation and thereby leads to exfoliation of the stone." The analysis is, nevertheless, an interesting addition to the scanty list of analyses of similar incrustations previously recorded.

Metropolitan Improvements, Southwark.

A site in Leroy-street, Old Kent-road, has been acquired for the erection of dwellings to accommodate those members of the working classes who will be dispossessed by the improvements which are about to be carried out by the construction of a thoroughfare that will extend from the Borough High-street to the junction of Long-lane (formerly White-street) and Tabard (formerly Kent) street, passing around the north and east sides of St. George's Church. The new route, for which the London County Council voted 207,400*l.* four years ago, will pass through the churchyard that was opened as a public recreation ground on May 22, 1882, and over the site of part of the later Marshalsea Prison, which was built in 1811 on the site of the White Lion Inn that had been converted into a gaol in or about 1558. The new Marshalsea, overlooking the churchyard on its north side, served until 1849 as a prison for debtors, smugglers, and pirates. Of late years the male debtors' side—a block of eight houses, built back-to-back, four stories high, and containing seven rooms each—had been converted into a factory, approached from Angel-court, formerly Bridewell, or White Lion, alley; beyond was the "Tap" and turnkey's house, of which the second floor formed the female debtors' side; and beyond that the chapel and Admiralty Prison, latterly a registered lodging-house. No. 211, High-street covers the open forecourt of the gate-house; the rear part of the shop is the old "lock," and retains the four posts and cross beams, with their brackets, of the two prison gates. That is the Marshalsea of Dickens's novel; the name of "Little Dorrit" has been adopted for the children's playground, which is now being laid out on the sites of Falcon and Redcross courts on the opposite (west) side of the High-street. That highly insanitary area and haunt of the criminal classes comprises also Birdcage-alley, Maypole-alley, Brent's-court, and Adam's-place, the removal of which Dr. Waldo, as Medical Officer for St. George-the-Martyr parish, advocated in a report he made to the Vestry in January, 1894. It is stated that whilst 800 persons are thus displaced, the death-rate of children under one year of age was 407 to every 1,000 born, as against 163, and that of mortality from zymotic diseases amounted to 4·1 per 1,000, as compared with 2·7, during the period 1892-5 in the whole of London.

Well-walk, Hampstead.

In the list we published last week of new sites for schools scheduled by the School Board for London is one which calls for a passing notice. One of two "alternative" sites at Hampstead consists of Nos. 7 and 9, Well-walk, which were formerly the Assembly-rooms of Hampstead Spa, No. 5 being the "Long Room." Our readers will recall that the three houses were scheduled in November of last year by the Board, and that the proposal to pull them down was strongly opposed by residents in the neighbourhood and others. On that occasion the School Board, who were then about to conclude their triennial term of office, relinquished their project in so far as it concerned the houses we mention. Whilst the out-going Board could not make any pledge that would be binding upon their successors, some kind of understanding seems to have prevailed in the district that the new Board would not include that site in their present scheme. At a public meeting held in the Drill Hall on Tuesday night it was resolved to protest against the action of the Board and to address memorials to the various authorities concerned.

The Society of Designers.

The President of the Society of Designers, Mr. G. C. Haité, made some interesting remarks last Tuesday evening on "Design and Designers of the Victorian Epoch." Two or three hundred years is the limit of time that Mr. Haité will allow to the existence of designers or pattern-makers in this country; prior to the immigration of the Huguenots the crafts had not advanced beyond the primary conditions of weaving and dyeing. The Huguenots settled in certain parts of the country, notably the banks of the rivers Wandle and Cray, whose waters were peculiarly suitable from their chemical properties for dyeing and other manufacturing purposes. To these people, according to the lecturer, we owe all our handicrafts. Their descendants still continue the calling of their forefathers, in some instances every member of a family practising one or another of the arts. Mr. Haité divided design into three periods: the first that of the pattern-maker, the designer of simple dress materials and ornaments, who disappeared about the sixties of the last century, and whose work is still the delight of the collector: secondly, the period of the architectural designers, headed by Welby Pugin, Owen Jones, Burges, Eastlake, and Godwin; and thirdly, the present generation of decorative designers. In the early Victorian era, he said, it was the architects who pulled design out of the mud; decoration being a constructive art based on reasonable principles of fitness and proportion, no training so effectively taught the broad truths as an architect's. The proper relation of plain spaces to ornament and ornament to mouldings was one of the most difficult lessons for the decorative designer to learn. Touching upon the subject of such universal requirements as wall-papers, chintzes, &c., the lecturer laid the blame for their bad style entirely on the middleman. The middleman rules the manufacturer by threatening to boycott his goods; dictates to the public as to what they ought to like; and practically creates the demand. We ourselves have more than once, at some large West End shop, been told that such a thing is no longer correct; we must have this or that hideous novelty. As a panacea Mr. Haité pleaded for academic recognition of designers. In some organised form of co-operation between manufacturers and designers the future of the handicrafts should lie; in that way it will be possible to know that what we buy is the expression of individual artists in their own line of handicraft.

Mr. Abbey's Boston Pictures.

Some years ago we noticed the remarkable series of five pictures by Mr. E. A. Abbey illustrating "The Quest of the Holy Grail," painted as mural decorations for the Public Library at Boston, U.S.A., and which were exhibited at Conduit-street before being sent out to America. These five represented the first portion only of the series; ten others, which complete it, are now finished and have been on view at the Guildhall Galleries. The subjects are (6) Sir Galahad meeting the "loathly ladye" and her companions after his exit from the Castle of the Grail; (7) Galahad slaying the "Seven Knights of Darkness" in the "Castle of the Maidens;" (8) a monk giving him the keys of the castle; (9) his reception by the imprisoned maidens—this is the central and largest subject, on a canvas 19 ft. long by 8 ft. high; (10) Galahad quitting his wife Blanche-fleur, in order that he may continue the quest; (11) Galahad again at the Castle of the Grail, where he has now sought the information he should have sought before, and is enabled to heal Amfortas of his wound; (12) Galahad on a white charger, passing through the land amid the benedictions of the people; (13) Galahad in Solomon's ship making the voyage to Sarras, an angel with outspread wings in the prow; (14) the city of Sarras; (15) Galahad before the Golden Tree at Sarras, surrounded by a circle of angels, and seeing his last vision of the Grail. The Arthurian legend has been rather freely treated, actions which properly belong to different knights being concentrated in the person of Galahad, in order to give unity to the representation. The whole forms a remarkable series of modern mural paintings, and Boston is fortunate to have a public building decorated in such a manner; but we do not know whether these latter pictures altogether equal the first five, as far as our recollection of them goes. The most effective are the attack on the seven knights, whose armour is of a most weird and picturesque type, and the closing picture of the series, a piece of purely conventional decorative work, but in that sense admirable. Next to these perhaps is the picture of Galahad riding through the land on his white charger; and the small picture of the city of Sarras is a curious and characteristic vision of a mediæval city. In the ship picture one cannot but feel that Galahad may well be engaged in prayer if

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he has to cross a stormy sea in so inadequate a craft; and in these as in the earlier series, the artist's conception of Galahad hardly rises to the occasion—there is still rather too much of the Broad Church curate about him. But as a whole the series is no doubt a remarkable production in decorative painting.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

PICTORIAL MOSAIC.

AN ordinary fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Regent-street, Mr. William Emerson, President, in the chair.

The minutes having been taken as read,

Mr. Alex. Graham, hon. secretary, announced the decease of one of the oldest members of the Institute, *i.e.*, Mr. Frederick William Porter, who was elected an Associate in 1850 and a Fellow in 1855. Mr. Porter practised largely in London, and was well known to many architects in London. A short memoir of his career would be published in the "Journal." He was sure that the members would wish that a letter of condolence be sent to the members of the family of Mr. Porter.

This having been agreed to,

Mr. R. Anning Bell read a paper entitled, "Notes on the Practice of Pictorial Mosaic," of which the following is an abstract:—

Mosaic, the author said, was a method of artistic expression which had many advantages peculiar to itself, and which also had very definite limitations. It was obvious to anyone who had studied the work of the past that the realistic representation of natural effects, although it had been sometimes remarkably near success, was not the way to get the greatest beauty possible out of the material. The material proclaimed itself at the outset as being unsuitable for realistic effects for two reasons. The first and strongest was the uniformity of its surface which rendered it impossible to get that variety in the texture of the material which was the special reason why oil paint was so triumphantly superior to any other material in the rendering of the look of Nature; the second, the fact that it had to be applied in separate pieces with an interval, however small, between them. The tints could not shade off into each other with quite the subtlety of paint, and the interstices formed a lacework of ground colour and shadow which was the same all over the surface, and added to the monotony of the texture. The material, therefore, commanded a certain flatness as the effect to be aimed at, and, as a corollary to this, a certain archaism or stiffness in the design. This very flatness of effect imposed some restraint on the style of the design. It was not truly archaic, but was the fullest expression which the limits of the material permitted, and gave an artist plenty of elbow-room for his invention if he had any feeling for the method. For pictorial mosaic the subjects chosen must be such as are suitable to austere treatment. The play of facial expression or momentary gesture was out of court. The characters introduced could not be likenesses, or the occasion of their introduction a mere incident; the characters should be types, the incidents symbolic.

Discussing the practical questions of working and placing the mosaic, the author said that it should be some way from the eye, and a good deal higher up. Like many other good things, when you want it you want plenty of it; it is best of all when entirely covering a large space and unbroken by architectural mouldings. This applies more particularly to gold mosaic, which, when covering walls and domes, running round the arches, flashing into a glistening flake of light as it turns the corner, and covering every inch of space above the capitals of the columns, is much more satisfactory in effect than when used in juxtaposition with stout arch mouldings and pilasters. Small panels of mosaic, the author said, he did not like at all, even where they are merely filled with conventional foliage, though that is better than the clumsy look of small figures close beside the smooth and exact forms of the mouldings which frame them.

In interior work, gold mosaic—a treatment, that is, in which gold is largely employed—seems to be infinitely superior in effect to a treatment in colours only. For external work the author considered the use of gold a mistake. First, from the practical side, owing to the construction of the tesseræ, it was likely to be damaged by frost, as the film of glass which covered the gold-leaf was very easily flaked off should any water get into the interstices; and secondly, from the æsthetic side, there was no mystery of shadow to bring out its peculiar beauties; it glittered so strongly in sunshine as to destroy the effect of the design of which it formed part, and it was inclined to look rather garish even in ordinary daylight.

Treating of colour, the author advised a light scheme of colour as preferable to a deep one. The cooler colours are pleasanter than the warm ones when used in any quantity. Much orange is peculiarly unpleasant, and even reds should be sparingly employed, and rather as accents to strengthen other colours than in masses for their own sakes. Blues and greens tell well at a distance; they have a charming quality, will keep their colour very fairly, though one needs to use a much stronger blue than might be expected if it is to be at all rich in effect. It may be taken as a general rule that differences of any bright tints carry much further and tell much more strongly at a distance than similar differences in a lower key. In whites a very slight difference will have a very marked effect, and it will tell less close to the eye than some way off, whereas quite the opposite is true of strong colours, particularly of red. Difference of quality in the glass has also a marked effect on its carrying power.

As regards tesseræ, very great differences of size are unadvisable in figure-work. A few large pieces among a large number of small pieces is unsatisfactory. If, however, large pieces are mainly used, a few small pieces here and there will rather enhance the effect. As an interesting example of this, Professor Beresford Pite's mosaic outside Pergami's Restaurant was cited. The effect is quite unlike what we are used to in mosaic, but the author would like to see more work done in this method. It has many advantages in a place like London. Dirt cannot easily settle on it, and when it does is easily washed off. It is permanent, and, as the pieces are so large, less labour is required than with ordinary mosaic. For outside work the author found that a scale larger than was generally seen in old work might be used with good effect. Should varying sizes of tesseræ be used generally over the work, any place where they are kept of uniform size will infallibly attract the attention by its regularity; this would be seen in a pilaster forming part of the background of the panel at Horniman's Museum.

Careful study should be given to the size of the interstices. In background work they can be quite large if the colour is not wanted to be very pure, the dull tint of the putty toning down or saddening brighter colouring. In such parts as faces, hands, or other details to which particular attention should be attracted, they may be quite close together, so making a comparatively solid mass of colour, and giving emphasis to the part. In fact, it would be difficult to work a face without keeping the tesseræ close, as the tone of the interspaces would destroy the quiet modelling, which is all that is necessary or advisable.

Remembering the limitations of the material, anything like truth of relative values or strength in the general effect of light and shade should not be attempted. Simplicity in modelling is desired. Variety of tone is obtainable by the relative strength of the colours used in different parts of the design. Realism of texture in draperies or other accessories should be avoided; trees, buildings, clouds, textiles, &c., should be felt to be rather symbols of those things than actual representations of them.

The author then treated of various matters and difficulties connected with the actual work of putting the mosaic upon the wall. His preference was for the method of doing the work *in situ*, a good result cannot possibly be obtained by other means. The modern Italian way, which the author described, is open to the obvious objection that you cannot see the progress of the work, and it is impossible to make alterations as you go on.

In translating the watercolour or pastel tints of the cartoons into coloured glass, a good deal of variety is possible, so that it is necessary to be always in touch with the workers to discuss with them which tint and quality of glass shall be used, and sometimes to vary from the cartoon when the work already finished may suggest it. The setting of the mosaic is an essentially artistic craft; it is absurd of the designer-in-chief to say simply: "Here is my cartoon; take it and copy it exactly." It is impossible to copy it anything like exactly, and consequently complete co-operation between designer and craftsman or craftswoman—for it is one of the things that women do admirably—is absolutely necessary.

Though the most splendid, as it is the most permanent form of wall or ceiling adornment, mosaic is extremely arbitrary, and any attempt to stretch its limits is terribly punished. It will not easily put up with rivalry, and will not endure other methods of decoration in immediate juxtaposition. In interior work it quarrels with stained glass, and it destroys gilding, as may be seen in many a Roman church where the choir-arch and columns are gilt around an apse of mosaic. Outside, the mosaic must be made the dominant in the scheme of which it forms part. No colour can stand near it but in humble subordination, and its surface texture requires considerable art and discretion in the choice of neighbouring materials. Nobly used, it nobly repays; ignobly used, it does nothing but disgust.

Mr. George Frampton, A.R.A., in proposing a vote of thanks to Mr. Bell, said he felt that men like Mr. Bell, Sir William Richmond, Mr. Walter Crane, Mr. Spence, and other workers in this very beautiful art were really doing a great service to the art of the country and to architecture. In half a dozen men and women we in this country had the finest mosaic workers in the world. Titian and other men who worked in mosaic, utterly failed, and the reason why they did so was that they had no knowledge of architecture. He did not see how a man could be a decorator unless he had been through a course of architecture, or had some love or appreciation of that art. It seemed to him that architecture governed all the arts, or should do. He quite agreed with Mr. Bell that they should avoid strong black shadows, otherwise they produced a kind of hole in the wall. Few people really understood decoration; they had an idea that it was easy to turn out some kind of shape, and that they called decoration, but it was nothing of the kind; it was abomination in decoration. What was wanted in decoration was the mind of the man, his own individuality and his appreciation of the surroundings of his work, which Mr. Bell always gave. Another thing he would like to impress upon architects, because he had learnt it himself, was that they could never get a successful decoration from a firm. He had never known a firm give anything that was really excellent, for no one in the firm had any real interest in the work, and he did not see how they could. The one idea of the firm was to get a profit, and the work was given to a workman who, as a rule, had very little or no feeling for art, and so it passed from one to another, and the result was that an inferior thing was produced which spoilt the building, and even if the building was bad it was much better not to add anything which would make it worse. Mr. Bell was one of the few men who really understood what was required to make a beautiful surface without making what he called a hole in the wall.

Mr. Walter Crane, in seconding the vote of thanks, said there was one minor point on which Mr. Bell made an ingenious comparison between the network formed by the cement lines in tesseræ and the textile lines which occurred in a half-tone process block. The textile line of a mosaic was a pleasing thing; one really delighted in it. It was in the nature of a built wall, a surface construction; and few things were more satisfactory than the simple joints of well-laid brickwork. In an irregular fashion one got that, too, in a mosaic, and that was a pleasing thing in itself. Mr. Bell made some suggestive remarks about a possible extended use of those joints, making them more open or narrower; and probably one might regard the putty or the joints, which were an essential part of the work, very much in the same way as one would regard the half-tone of the ground in painting; for instance, in working chalk on brown paper, one frequently left the paper in large interstices to speak for itself; it fell into the general scheme. So in mosaic, one might fairly regard the more or less brownish interstices as a kind of half-tone on which to impose colour. As regards the use of gold externally, most of them must have felt what Mr. Bell

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expressed—that there was a certain glitter, a garishness, in it as used externally. That, he fancied, would largely disappear, perhaps, if it were not applied to a perfectly flat surface; but he was inclined to think that in no case did gold look well on a perfectly flat surface. A curved or concave surface was generally much finer, owing to the variation and gradation which the shadows gave, and also the half-light. Mr. Bell had spoken of the impossibility of reproducing a cartoon. He (the speaker), however, had made designs of mosaic long before the present method of working *in situ* upon the surface was revived with so much success. He remembered making some designs at the instance of Professor Aitchison for the Arab Hall in Lord Leighton's house, and those were executed, he believed, by the Murano Company. It was then necessary for the designer to make an exact cartoon, tesserating the whole of it, and marking all the joints in black, and he was very much astonished at the facility with which those designs were reproduced after the method Mr. Bell had described—viz., by laying down the work from the back. There was very little variation, the tesseræ were given with the utmost exactitude. and the matching of the colours, allowing for difference in brilliance and translation of the dead colour from the finished colour of the cartoon, was simply extraordinary; even then he believed there was some method of giving a little push to the work when they turned it round, especially to get more variation of facet upon the background. It was only fair to say that those panels would bear examination as good workmanship, so far as exactitude and precision went.

Mr. C. Harrison Townsend said that with Mr. Bell's introductory remarks on the principles of mosaic no one could fail to agree, but he particularly felt the strength of Mr. Bell's argument on behalf of what he pleaded for under the somewhat unhappy name of "archaism." A certain formal, a certain conventional feeling which was given to the expression of the figure and of nature in mosaic work was, unhappily, apt to be classed by those who did not understand the conventions and limitations of the material as a wilful attempt to imitate the method of work of those who had preceded them. He thought that Mr. Bell had made it clear that that stiffness, that formality, and that conventionality did not proceed from an attempt to imitate. As in architecture, so in every kind of decorative design, to attempt to do other than what the conditions allowed was doomed to failure, but to allow oneself to be influenced by the material and to shape the design according to the limitations of that material was to show oneself an artist and a man who recognised the method in which he worked. To work in mosaic necessarily implied, if they were logical or had common sense, certain limitations which had to be recognised. A worker in mosaic did recognise and accept them, and did the best within these limitations, which, however, robbed him of any hope of dealing in atmospheric effect. The glory of the sunset and the romance of the moonlight, for instance, to him were symbols of sentiment—they were not imitations of sentiment. Trees in mosaic did not represent trees of Nature, with the glistening of the sun or the tender white of the moonlight: they were symbols of trees; but, working in mosaic, one was paid for sacrificing those artistic attributes, and the reward was that one worked in an imperishable material. Mosaic work could resist all but fire; it could resist water, London fog, and all the vicissitudes of climate, and still be uninfluenced in its colour. It could hand down, as the Ravenna and Sicilian mosaics did, the colour scheme of the artist 1,000 years after he had perished—unchanged by time and undiminished in brilliancy. Mosaic work was the only artistic work that could be handed down as the artist did it, and that of course was a great privilege which was worth sacrificing something for. In reference to Mr. Bell's interesting remarks as to the technique of mosaic—the technique so far as the various cements were concerned—the decadence of mosaic work, curiously enough, coincided with the attainment of the one perfect cement. Up to about the year 1500 mosaic workers contented themselves with working in lime cement, and Muziano de Brescia was the first to use, in 1528, oil cement, which allowed them to obtain effects which were impossible with a quickly-setting cement. The new method allowed deliberation, and afforded opportunities for alteration, whereas by the old method work had to be done quickly.

Mr. F. R. Spence said he thought the technical part of mosaic work might well be left to the man who had to carry out the work. That was a matter they need not worry much about. Now that there was a general and growing interest in the use of mosaic for decoration, its treatment should be approached in a practical and common-sense manner. In all schemes of decoration the great battle lay in the design, its suitability, and its application to the right spaces, so that, as in all decorative art, no man should embark in its practice unless he possessed the rare gift of design. Great discrimination should be exercised in the selection of the surfaces to be covered with mosaic. In every case such selection should be of spaces which had at all times shed upon them the toning and uniting qualities of light and shadow. All interiors possessed these conditions more or less. External, flat, shadowless spaces were not quite satisfactory in this respect. They were always in one of two conditions—either in bright or else in unflecked shadow. Granted that these panels or friezes might be good schemes of colour, yet they were shorn of the added charm of permanent variety and mystery. In the actual material the more brilliant and solid the colour the better. He used to be delighted to get the slabs of material which had delicate gradations of colour in each piece, but when they were cut up and fixed all these gradations were lost. If they were right in the first place with the surface to be covered—being under a fixed condition of varying light and shadow—this light and shadow would give naturally the subtlety and mystery without destroying the effulgence of the colour scheme. Deep, almost crude tones become rich and mellow, not impoverished. His meaning might be made clearer by mentioning Titian's wonderful blue drapery, the shadows of which were a deep red. One should be liberal in one's areas of colour, and not fritter away by intersecting forms of ornament that in themselves were small in design. Drapery forms, fine in the designs of their lines and folds, were sufficient for the particular spaces they cover. Great spaces of blue or other colours in such forms as a dome, let its tincture be ever so crude, become harmonious from the natural shadows of its shape and the soft reflections of surrounding objects. The shadows and reflections were a broad and sweeping tone of softening unity. No mosaic, he thought, should be nearer the eye than 10 ft. Its function was to express the sentiment of colour, and not to usurp such attributes as need all the delicate and far-reaching craftsmanship capable of application to marble, metals, wood, &c. Some advocate that in the application of mosaic internally all mouldings and architectural features in any other materials should have no place. The vision of its success, however, had no place in his dreams. To him the juxtaposition of many and varied materials was inseparable from a really triumphant scheme of decoration. Jewels owed a large debt of gratitude to their setting. Figured subjects should be used where they suffer no distortion of their form. The treatment of figures on a dome, unless they formed shadows in perfect outline, were not, to his mind, satisfactory. Some asserted that figures should be drawn in simple lines without modelling. His experience led him to think that they should be modelled to a considerable extent, for when the mosaic was carried out its crudity came very far short of the modelling on the cartoon, yet it added a quality of colour much more interesting than flat spaces filled in between hard black outlines. He need hardly say that the design should be in unity with the architecture. It should not belittle its details, but rather add to the expression of its parts. His idea was that no decorator, in the treatment of a large figure-subject, could afford to drop certain simple architectural forms in the actual picture which were of the highest importance as details to bind together its composition. He did not mean that details of the enclosing architecture should be reproduced or carried into the picture, but only such simple details as would give it those rigid and geometrical lines which unite and save it from chaos. In mosaic they possessed a brilliant and permanent material for decoration, but, as in the making of a fine piece of architecture or any other work of art, they must come down to the bed-rock of creation—conception, design, call it what one will; the all-important need is the man who can capture the beautiful, and has the practical sense to apply it rightly.

Mr. Bridge said that the putty need only be ¼ in. thick, and the tesseræ, when pushed in, displaced the putty and left about ¼ in. behind. The general basis of the putty he had used was lime and boiled oil, but the lime should be old—some two or three years.

Mr. Brindley said he had been greatly interested in Mr. Bell's paper, but little had been said in reference to the fixing of the tesseræ on the actual ground. All the good old Byzantine mosaics were, he believed, lime mosaics and not oil and putty, but probably they had albumen in them. Reference had been made to lime and powdered marble, but much of the lime and powdered marble that we read of in olden times was marble not thoroughly burned through. Half of it would be lime and half of it marble which had become disintegrated, so that when it was put under the rollers it was crushed up. The marble that one saw at Parma and throughout Sicily (the marble-like covering on the rough stones) was pure lime, with nothing but albumen in it. With regard to the mosaics of the Byzantine period, his conviction was that they were nearly all applied on paper the same as was done in our modern way on a cartoon. In the case of the domes of St. Mark's, what practical man would put in tesseræ by tesseræ on a large surface like that, and what would it cost if it were done? He did not think it was worth the trouble at the height of St. Mark's dome, for the different sized tesseræ were not seen; they were all practically of the same size, and the dome looked like a large copper burnished cauldron with enamelled figures on it. There was nothing to disturb the solidity of the dome. The more joints there were in mosaic the stronger he considered the work, but by the modern method he was convinced that the tesseræ would come out.

Mr. W. Woodward said, as to embedding tesseræ in cement, there were, he understood, two methods — one to embed the tesseræ so as to produce a flat surface, and the other so as to produce a series of facets; and examples of the two methods could be seen in St. Paul's Cathedral. In the cupola of St. Paul's could be seen mosaic by Salviati, laid so as to produce a flat surface; and, in his opinion, the money spent on that particular form of mosaic had been to a large extent wasted, and a similar effect could have been produced at considerably less cost. If, however, they would look at the mosaic work of Sir William Richmond, they would see that, in order to produce certain effects, the tesseræ had been placed anglewise, and the difference between the two methods was wonderful. One was lifeless and the other was perfectly brilliant, reflecting beautiful tints from the facets.

Mr. E. W. Hudson said, as an example of a mistaken attempt at a realistic representation in mosaic, he had thought of a portrait in the Brighton Museum of King George IV. Upon some 6 ft. of surface there were thousands of pieces of small tesseræ, and at some distance from the work it was difficult to tell it from an oil painting, of which, no doubt, it was a copy. Every high light, middle tone, and shadow shown by the garments of the period had been attempted in the work, and it would probably be impossible to find a greater misapplication of ingenuity and perseverance and a greater waste of time and money.

Mr. Thomas Blashill said he supposed they were all agreed that the cost of the process described by Mr. Bell was such that there was not likely to be much of it done, and that in itself was a pity, for out of a large amount of work excellence was more likely to be obtained than by a limitation of work due to extreme cost. He therefore would like to ask a question as to a modified form of mosaic work. No doubt many of them had been to the Château of Chenonceaux in France. On the left of the entrance to that building there was a formal garden and there was a parapet about 3 ft. or 4 ft. high to a wall separating the garden from the river. The inner side of that wall was plastered, and in the plaster were set patterns in differently coloured stones. That did not, of course, compete with pure mosaic—with mosaic for the whole surface, and it was very coarse, but it seemed to have an interesting effect. He did not know if that kind of work was done to any large extent, or whether any one knew much about it, or

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whether it could be usefully done here, but he was afraid it would not stand so well in this country as in France. Perhaps if a better kind of plaster could be invented, and a good deal of work could be done, something might come out of that as an alternative form of decoration for larger surfaces. He had had a certain amount of mosaic work carried out, and he knew something of the difficulties referred to that night. The flat surface treatment was, he supposed, best seen in the mosaic reproduction of great pictures in St. Peter's at Rome. The mosaics at Ravenna were remarkably coarse, and some of the pieces, which looked like mother-of-pearl at a distance, were merely dabs of white paint unless they had since been restored.

Colonel Lenox Prendergast said that Mr. Townsend had referred to a point which was of considerable importance to those who were likely to do much mosaic work. According to Mr. Townsend, at a particular period a different material was discovered in which to embed the tesseræ, and it seemed to have affected design. One knew what would happen if this method of decoration was practised to any large extent; the artists would become, as unfortunately they had become in other matters, archæologists, and back they would go to Constantinople and St. Mark's. No one would disparage the great workers in Constantinople and Venice—at St. Sophia and St. Mark's. The former place was the headquarters of art, literature, and science of the time, as had been conclusively proved within recent years, and the work done then was splendid. Constantinople sent out the finest enamel, carving, materials for vestments, &c., that the world had then seen, but they reflected the work of the particular period in which the artists lived; and why should we go back and reproduce in our buildings merely what artists thought and did in those days? He did not think that should be done, and yet he was afraid it would be if Mr. Bell was to be followed. In one of the chapels of St. Mark's—the Chapel of St. Isidore—there was some very beautiful mosaic, which, however, would be condemned by Mr. Bell. What was at the bottom of the revival of mosaic work in this country was that it would wash, and that was the great recommendation of the method, and it was very desirable in this smoky atmosphere of ours to encourage the use of such a material, provided freedom of design was left unfettered.

The Chairman said that with regard to Mr. Bell's statement that the expression which the limits of the material allowed should be our guide in designing mosaic, he thought this was a truism that we could not get away from. It was shown in the different effects of certain mosaics. Take, for instance, those at St. Peter's at Rome, which were copies in tesseræ of certain old paintings, if he remembered rightly. If we compared them with the examples of mosaic at Santa Maria, Maggiore, or at St. Mark's, or at Pisa, the two things were entirely different. To any man of cultivated taste those at St. Peter's could not compare with the others. Notwithstanding what Colonel Prendergast said, he did not think they could avoid a certain amount of archaism from the material they proposed to use—indeed, the more archaic it was, the better the mosaic to his mind. With regard to gold mosaic, he agreed entirely with Mr. Bell that for external work it was not very satisfactory, whether on a plain or on a curved surface. Mosaics in the atmosphere of this country were apt to look garish, like very bright dresses on ladies on a foggy day. In India, where the sun was very bright, the colours of the mosaics were exceedingly harmonious—they were dull greens and blues and neutral tints and whites; although they were brilliant in general effect, there was nothing garish about them. As to leaving the tesserating of the design to the workmen, he could not think that that was right. The expression of the design depended greatly on the tesserating, and he did not think that a man could have his cartoon properly expressed by a workman who puts in the tesseræ perhaps from his own idea; he had seen specimens of mosaic done in that way, and the tesseræ had been higgledy-piggledy all over the surface. When he was in Burges' office (and, in fact, since, when he had had mosaic work to carry out on his own account) they used to draw out every single tessera, and show exactly where the joints were to come, and he was inclined to think that was the right way. The old mosaics were generally arranged methodically, in order to get the archaic effect which Colonel Prendergast decried. The colour of the interstices was a very important thing in mosaics. His attention was drawn particularly to this some years ago when Street was doing the Guards' Chapel. The marble mosaics there were a little higher than level with the eye. First of all they were fixed in some material—he did not know what—and the interstices and joints showed a light colour. He was charmed with them the first time he saw them. They looked like frescoes, having that "sucked-in" appearance. The colour was beautifully soft and delicate, and sufficiently near the eye to be appreciated. Some little time afterwards he found that the little figures had all these little joints taken out; they had practically been painted over with dark paint, and to his mind the effect was entirely spoilt. He was in the Guards' Chapel a few Sundays ago, and he still thought they lacked colour compared with what they had the first time he saw them. There was not the slightest doubt that the greatest difference in effect could be obtained by thickness of colour in the joints of the tesseræ. With regard to the size of the tesseræ, personally he did not like the large pieces, though that, he supposed, was a matter of taste. There was a marked difference of effect between mosaic in large pieces and that in small tesseræ. He did not mean minute tesseræ like those in St. Peter's; but large pieces of mosaic always suggested to his mind the difference between *appliqué* work and embroidery. The one was a highly refined, finished piece of work, and the other seemed an easy-going, coarse method of getting over the difficulty.

The vote of thanks having been heartily agreed to,

Mr. Anning Bell, in responding, said Colonel Prendergast rather disputed his idea of the treatment proper to mosaics. Perhaps he had not sufficiently expressed his feeling that it was not archaism. He did not deduce what he thought was the proper treatment from the old work, but from the nature of the material itself. He did not think the work could be done in any other way to make it look well. A great deal of realism could be got, but in doing that the beauty of the material was sacrificed, and only a very poor painting resulted; whereas this glassy, stiff, formal material was a beautiful thing in itself. He did not clearly recall the chapel of St. Isidore, but that fact showed, he thought, that personally he was not very interested in it. He had seen a good deal of work of that kind, and very able work too; but, to tell the truth, he rather thought that it was playing the fool with mosaic to do that sort of thing. Mr. Spence rather disputed his idea that mosaic should dominate to the extent that he thought it should. Mr. Spence thought it went well with a lot of other materials. He (Mr. Bell) did not think so. In an apse in a church it looked well with other things all around, but it must be remembered that in most cases of old work the apse was generally the best thing in the church, and, as a rule, it had been knocked to smithereens and restored, so that it was rather hard to say that one had data to go upon in saying that. He himself felt that it was very much better where there was a great deal of it. Mr. Spence also said that outside mosaics should have variety and mystery. He did not quite see how that was to be got. It would be nice, but they could not get variety outside in a bright light. The other was the right treatment, because one got a whole treatment that looked harmonious with relation to the stone and things round it. As regards the point Mr. Brindley raised, that the old work was done on the flat, and then pressed face downwards, he did not think the point of taking so long to do affected those people particularly; they had a good many centuries to do the work in, and even when they did it quickly they employed many men. He had not, perhaps, sufficiently enforced his point when he spoke of the unpleasant effect of laying down mosaic because it was so flat. He meant from the front. They could not help getting a constant variety of plane by the natural touch of the finger in putting it down. He thought that was implied, and he never did anything else. He agreed about St. Paul's that the old mosaics were very poor mosaics and nasty-looking things; but Sir William Richmond's, although they were done in an excellent manner, were perhaps a little exaggerated and a little too lofty. He had got a little too glittering and shining an effect; and, if he might dare to say such a thing, he thought the designs of Mr. Watts were not things for mosaics, they were rather florid for that kind of treatment. He was interested in hearing Mr. Townsend's point that the old mosaic was only invented in 1528, which was afterwards commented upon when we were asked why we should stick to the earlier work. He did not think it was a question of having no medium. It was simply that the earlier work could not help being more limited, the materials being so limited that it was difficult to get outside them. When once they got a chance of doing clever things they did them. It was just the same as in all other things. The history of all other art was, first of all, that a savage man must have a pretty strong impulse to want to do anything at all, except kill other people and get things to eat; he did not know much, and had to fumble about, and slowly he acquired the power to express his ideas. While it was difficult to express his ideas, he wanted to express them to the best extent, but it was so hard that he was pretty careful about the ideas that he expressed. But when he got easy with his material he wanted to do things that were clever in it, and to do things which were hard to do. And so every art almost rose and fell in that scale. He did not want to take the early mosaics (of which he approved) as being the only examples to follow, because they were of that period. He did not wish to say that the later ones must not be followed because they were later, but because he did not like them himself. He thought the later ones went wrong because they did not try to do what the mosaics did so well, and that the earlier ones kept within limits, partly because they did not know any worse! We should look at the stuff and see what it can do, and then do all we can with it, but we should not try to do more than we can do. It was interesting to hear Mr. Crane's remarks about the cartoons being reproduced in work that he had done. He agreed that it could be done, but all the same, in his opinion it was not a desirable method; and he felt he was rather at issue with the Chairman there, as he (the speaker) was of opinion that the workmen should be given some play along with the artist. Workmen differed so much in their power of carrying things out that one soon found out which of them could do the better work and which the easier work, and one could allot the work accordingly. And then there was a kind of variety got. Then there was one other point. Mosaic was not against realism, but he thought that it showed the advantage of not being able to get realism—that mosaic was one of the very few arts in which one was forced by the necessity of the material and the limitations of the material to a rather higher plane of thought, or at any rate into somewhat lofty subjects which could not be expressed by clever interesting execution. It meant the plain verities of simple facts: Time, the Judgment, Life—those things were best treated in something which could not remind one of other clever things in the same material. It had just got to be austere and definite—a sort of raw presentation only of the idea, with no draping or ornament to it. Mosaic did that, and so it was peculiarly useful for religious work.

The Chairman announced that the next meeting, on December 2, would be a business meeting, when the election of candidates for membership would take place, and the results of the November examinations would be made known.

Mr. Lacy W. Ridge has given notice that he will move a resolution to the effect that the Royal Institute of British Architects desires to thank the Local Government Board for the issue of model by-laws iv. (Rural Districts), but while doing so the Royal Institute would urge on the Board the desirability of preparing a model to enable Rural District Councils to regulate party walls as distinct from external walls.

Mr. H. W. Wills has given notice that he will move the following resolution: "That in the interests of the profession it would be advisable to have a list of Institute assessors drawn up from whom the President would nominate, and that this list be from time to time revised."

The meeting then terminated.

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THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of this Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. G. B. Carvill, Vice-President, occupying the chair in the unavoidable absence of the President, Mr. W. H. Seth-Smith.

The minutes were read and confirmed, and the following gentlemen were elected members, *i.e.*, Messrs. E. S. Barr, J. C. Bucknill, F. Bisset, W. J. Delbridge, J. H. Goodchild, C. L. Hampton, G. O. Howship, A. S. Jones, E. J. Kallenborn, E. G. Millar, D. W. Pollock, E. Pitt, H. Sandford, W. J. M. Thomasson, A. H. Whyte, and E. H. Walker.

The Chairman then nominated Mr. R. H. Weymouth to fill the vacancy caused in the Committee by the appointment of Mr. A. T. Bolton as head-master of the Day School. The election will take place at the next meeting.

New Premises Fund.

The Chairman said it was his pleasing duty to announce the following list of donations to the New Premises Fund, *i.e.*, Mr. J Macvicar Anderson, 250*l.*; the late Arthur Cates, 250*l.*; Mr. Henry L. Florence, 250*l.*; Mr. Arnold Mitchell, 200*l.*; Mr. Aston Webb, A.R.A., 200*l.*; Mr. E. A. Gruning, 100*l.*; Messrs. Alfred Waterhouse, R.A., and Paul Waterhouse, 100*l.*; Mr. A. Brumwell Thomas, 50*l.*; Mr. William Emerson, 50*l.*; Mr. T. M. Rickman, 50*l.*; Mr. W. Howard Seth-Smith, 50*l.*; the late William Young, 50*l.*; Mr. J. A. Gotch, 31*l.* 10*s.*; Mr. Reginald T. Blomfield, 25*l.*; Mr. G. H. Fellowes Prynne, 25*l.*; Mr. A. E. Street, 21*l.*; Mr. Ronald P. Jones, 10*l.*; Mr. A. T. Bolton, 10*l.*; Mr. Walter Emden, 5*l.* 5*s.*; Mr. W. L. Trant Brown, 5*l.* 5*s.*; Messrs. C. J. Blomfield and A. C. Blomfield, 5*l.* 5*s.*

The Sanitation of a Country House.

Mr. Max Clarke then read the following paper on "The Sanitation of a Country House":—

I have been wondering since the Committee of the Architectural Association asked me to read a paper on this subject whether they paid as great a compliment to the members as they did to me. That, I suppose, must be settled by each member for himself. As a rule, "sanitation" is looked upon as a matter to be got over with the least amount of trouble possible. When I say this you must bear in mind that I do not pose as a sanitarian; I simply look at this branch of the duties of an architect in the same light as I do any of the multifarious matters he is called upon to deal with for the usual 5 per cent.

Let me tell you how it came about that I was led to think seriously of the particular matter under consideration this evening. Many years ago I was walking through the streets of a provincial city with a friend; he had with him a clerk of works, who was engaged upon some of the buildings in course of erection, and had been upon others. Pointing to a pipe against a wall, this gentleman said, as well as I recollect, "The authorities are under the impression that is a ventilation-pipe, but I just stuck the end of it into the ground, and it looks all right and does no harm." This remark made a great impression upon me, as I could not help turning over in my mind, were the authorities at fault in asking for a ventilating-pipe or was the man at fault in so deceiving them. I always hope the architect knew nothing of the transaction, but he should have done so if he did his duty.

Now, gentlemen, let me for a moment substitute the word "hygiene" for "sanitation." The explanation in a dictionary of the word "sanitary" is "pertaining to, or designed to secure health," and of the word "hygiene" "the science which treats of the preservation of health." There does not seem such a difference between the two definitions that I might not substitute the latter for the former word. Now I must ask you to turn with me to the introduction to Parkes' "Hygiene"; the first paragraph is as follows:—"Hygiene is the art of preserving health—that is, of obtaining the most perfect action of body and mind during as long a period as is consistent with the laws of life. In other words, it aims at rendering growth more perfect, decay less rapid, life more vigorous, death more remote." This paragraph I consider the most admirable definition of "Hygiene." I should like to read to you the whole of the introduction, but time will not permit, and I can only suggest that each member, at least each junior member present, and also those who may look over this paper in print, should carefully read over and consider the whole of this introduction to Parkes' "Hygiene."

Just fancy for the architect what the above paragraph means; that each one has it in his power to assist in such an endeavour, which, if carried out, would alter in a great measure the whole state of mankind, because that is what it really means, "the most perfect action of the body and mind." Is this not what we are all aiming at in various ways, or should be? Now, let me ask, how many of the architects in the United Kingdom have a copy of this particular work in their library? How many have given it the consideration it deserves, or deem it one of the main objects of their lives to further the objects it treats of? If I can only bring *some* of them, and particularly some of the rising generation, to realise that "The Art of Architecture" embraces such a duty to the whole of mankind, I shall have accomplished something. There are many different views as to what the duties of an architect are. They seem to me largely to turn on how much an architect should do or can do for 5 per cent. Lengthy articles have been written on his duties as an arbitrator and such like, but where does one read of his duties in rendering growth more perfect, decay less rapid, life more vigorous, and death more remote.

The other day the address of our President contained a paragraph to the following effect: "It is a fault in our training that our pupils are not on the works enough, and that we do not specialise enough. Highly trained men, with a diploma from a guild or an institute or what not, ought really, if our building is to be of our best, to confine themselves to design and the supervision of building construction, and not to meddle with surveying, valuations and dilapidations, bills, &c., work which certainly does not savour of art."

Might he not have added to the list "sanitary engineering." It really is a most difficult matter, at least to my mind to decide what we should do ourselves and what leave to others; for my own part I see nothing wrong in employing another man to do that for me which I know he can do better than I could myself, the only difficulty to me is, who is to pay him? Personally I feel I should, if I undertook to do work for such and such a percentage, and if I were quite sure that my client got the advantage of the best information on the subject.

Now you may say, what has all this to do with the "Sanitation of a Country House" and my reply is this, that I look upon the title of the paper from the very broadest point of view, it not only concerns the drains and pipes, but it deals with almost the whole structure from foundations to roof-tree, and it is only by an architect having in view the benefit of the whole community at large, that he will have fulfilled his duty to mankind in general and his client in particular, not to speak of himself. It does not signify what the matter in hand may be, he is morally, if not legally, responsible for the result of his work, whether in fact it is a benefit to posterity or the reverse. I do not think this view of the case is brought home often enough to architects, and I take this opportunity of pressing it upon the younger members of the Association; for it is to those I am here to speak, the older ones I hope know as much about sanitation and hygiene as I do myself, whether these two items always get the consideration they deserve from men in practice is a question.

My friends say that I am very prone to deal in facts, when generalities would in their opinion answer, and my reply is that I think the more one gets to what some call "rock bottom" the better will our work be, whether it be as an art or profession, so I am going to give you a few instances of cases which have come before me. Some few years ago I had something to do with a building where the architect had, I presume, great confidence in his clerk of works and foreman; at any rate, they were given a plan of the drains; it was neither very good nor very bad, and the work was done. A short time afterwards, from various causes, the drains were overhauled, and it was found that there was one length of 9-in. pipe into which several 6-in. pipes were branched, and on the 9-in. pipe, between each of the 6-in. branches, a 9-in. syphon trap was discovered, each trap being quite blocked up with soil; so far as I recollect there were five traps in a length of about 60 ft.

I heard of a case the other day, equally interesting, but from another point of view. A house in the country—fortunately I do not know either the neighbourhood or the architect—built not long ago, lately from some cause the drainage had to be examined, and was found to be defective. An architect was of course employed to put matters right, and his way of doing it was to write a letter to a builder instructing him to test the drains and put in new where he considered necessary, no supervision beyond a casual inspection being exercised over the country builder or what he "considered necessary."

I need hardly tell you my point is, that papers might be read here and elsewhere till doomsday without any practical result, unless men take a different view of their responsibilities from those I have just quoted.

Having pointed out to you what I consider the responsibilities of an architect are in connexion with sanitation, it now remains to get an idea what are the sanitary requirements of any house, as I do not believe we should build any worse for the poor than we should for the rich, so far as sanitation goes.

We need not consider site, aspect, or prospect, as it seldom falls to the lot of an architect to decide on the first, and any man worthy of the name of architect would deal to the best of his ability with the two latter items, on which there is plenty of information to be had, and they are not matters which require supervision.

Subsoil Drainage.—The lie of the ground requires most careful consideration, and the drainage of the subsoil, if such is required, always bearing in mind that it is better to lay land drains so that they will convey water *away* from the house than towards it. I mention this, as I saw a scheme a little time ago arranged to convey all the subsoil water in a pipe under the centre of a house when it would have been quite possible to take it away at the sides of the house. Land drains or agricultural pipes are liable to get blocked up at times, which should be borne in mind when laying them. The general drainage I shall speak of later.

Foundations and Concrete.—The foundations should receive careful consideration even in the country, taking care in a clay district to carry them well down beyond the level which may be affected by droughts; if this were done we should not hear of so many cracked buildings and under-pinning jobs, which, though money-making for the architect, are not pleasant for the client.

In connexion with the foundations, let me remind you that Portland cement requires more examination and attention than it usually receives from architects. I find it very difficult to get it sufficiently air-slaked—or, in other words, it is, as a rule used when it is too fresh; it sets so rapidly that it is partly set before it is used in brickwork, drain-work, or concrete, and if knocked up again of course it is not the least use; it is also more likely to blow or expand when used fresh, accounting for the number of stone-ware pipe-collars fractured which are to be met with.

Damp Courses Over Area of Buildings.—Covering the area of buildings with Portland cement concrete, as required by many authorities, is for the purpose of keeping down ground damp, which, where there is no concrete or other damp-proof course, is liable to be drawn up in the building when the latter is heated, the damp or noxious gas sometimes coming from great distances where the earth is light or porous. In this way sewer gas may be brought into a building from defective sewers existing at a considerable distance. In order to prevent this, care should be taken that the cement is sound and slow-setting, and that the concrete is not porous: the aggregate not being too large, such for instance as brickbats, which one often sees in concrete. The surface should be well beaten down and smoothed over with a shovel so as to form an impervious face, even if the concrete is only to act as a damp-proof course, and not as a floor.

Damp Courses.—Damp courses in walls should receive great attention. The very old-fashioned clause to be found in specifications, "two courses of stout old slates bedded in cement," should, I suggest, be abolished, as it is most difficult to get stout slates, either old

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or new, the usual type being so very thin that they break easily and are often damaged before the wall is built upon them. Asphalt often suffers from being laid upon the walls and then used as a gangway by the men on the works, or is otherwise damaged by moving materials upon the walls before the brickwork is continued up over the damp course. Whatever the material may be, it should be carefully protected until the superincumbent walls are built, then we may assume that we have done all that can be done to ensure a perfect layer of material to prevent damp rising. I do not give an opinion as to the *best* material to use, only care should be taken in its use. In connexion with damp courses and floors, I doubt if sufficient attention is paid to cases where there are wood floors with a space under, one side of a wall and tiles or mosaic with concrete under at the other side. Then some precaution is required to prevent the damp getting from the earth and concrete on the side of the wall to the flooring and timbers on the other side.

Numerous methods can be adopted, but they are usually conspicuous by their absence.

Vertical Damp Courses.—Vertical damp courses or dry areas are most important to rooms underground. I do not think there can be any doubt that, where a wide area cannot be obtained, covering the external face of the walls with a double thickness of asphalt is the very best means of keeping out damp, the asphalt forming a horizontal damp course at the bottom and extending vertically above the level of the surrounding earth. My experience of hot compositions poured into a cavity in the wall is, that such care is necessary to prevent mortar droppings getting down, and to ensure the hot material getting down and adhering to that already in, I shall not risk it. The external application I can see and examine, the internal I have no means of knowing whether it is in as it should be or not.

Ventilation under floors should be attended to, sleeper walls being built open to allow of currents of air through the open spaces; one forgets at times that putting in an air brick to the space under one room and carrying up the brickwork close under the floor all round without any openings other than the one is not "ventilation," it is only leaving a hole. All holes made in walls should have a fall outwards to prevent wet being driven in.

Bedding wall or pole-plates in main walls at the ground level is a mistake, they should always be carried on corbels, piers, or independent walls. In connexion with this, I think hoop-iron, well tarred and sanded, is to be preferred to wood wall-plates.

Walls.—With regard to walls, what shall I say? That you should avoid, if possible, using 9-in. walls. It is not sanitary work, in my opinion, to builda house costing, say, 2,000*l.*, all the outer walls being 9-in. brick; and particularly when the bricks are porous, as so many are nowadays, put together with poor mortar, and not even damped before laying. Of all the simple requirements in building, I do not think there is any single one I have so much difficulty in getting carried out as wetting the bricks well before they are laid; if this is not done the dry brick absorbs all the moisture out of the mortar so rapidly that the material is little better than dust or dry mud. Hollow walls require attention to see that the cavity extends below the level of the internal damp course; also that mortar is not allowed to drop down the cavity and rest on the wall, thus forming a means for the damp to pass from the exterior to the interior lining of the wall. The lead covering of lintels or arches over openings in hollow walls require attention to ensure the ends of the lead being welted and turned so as to direct the moisture to the outer wall.

I have had some experience in building with granite, and I find it is a mistake to allow through or bond stones to extend to the inside face of the wall, as damp patches are usually found where the ends of these stones come. This is, of course, where neither brick lining or "strapping" (the Scotch term for battening and plaster) are used.

Roofs.—Some points in roofs require attention; one of the most important, to my mind, being in cases where eaves gutters rest on the tops of walls or on oversailing courses. It is a practical impossibility to make a cast-iron eaves gutter perfectly watertight, therefore short lengths of lead should be fixed on the top of the walls at each joint in the gutter to take the water which escapes from the joint away beyond the face of the wall, not allowing it to percolate into the brick and stone, and so form a very unsanitary spot, as well as an eyesore on the inside. These pieces of lead should be welted at two edges, and of the other two edges the back should be turned up and the front edge turned slightly down where beyond the outer face of the wall.

Down pipes are, as a rule, too large and too numerous in most buildings, where gulleys have to be fixed at the bottom of each stack, involving unnecessary drains and extra work clearing out, &c. The pipes should always be fixed so that they are clear of the walls in case of leakage.

I would suggest that "soakers," which are more usual in the north than in the south, are better in every way than either secret gutters or flashing, the cover flashing being less liable to damage than flashing laid on roof slates. Soakers also make a good finish to hips where the taste of the architect does not permit of hip tiles, slate, or lead coverings; the slates can be cut to a close joint down the angle. Slates of a greater width than the ordinary size should be used in these positions, so that no very narrow strips or small angle pieces are used, as these usually have only one nail or peg, and are very liable to get broken and fall off.

I think two courses of slating battens, the lower one vertical and the upper horizontal, is a good method of obtaining an air space in roof construction, and so rendering the interior less liable to be affected by changes of temperature. Felt should be clearly specified and examined as to quality, the cheapest, which is often seen on work, is not a desirable article.

Silicate cotton or slag wool is a most admirable non-conductor, as well as being a sanitary material, to be used in almost all cases where hair felt is so often used, the latter being a happy hunting-ground for all sorts of vermin, whereas the slag wool is, to them, most objectionable; this applies to roof coverings, pugging in floors, "lagging" or covering pipes of all sorts, and all the other purposes a good non-conducting material is used for.

I need hardly refer to the fact that the common floor with wood joists, floor boards and ceiling plastered, is not a "sanitary" floor, but it will be some time yet before we can get a solid floor of any sort used in country houses even of the better class, so I need not go into the difficulties of any of the varieties, either as to cost or execution, but I may say with regard to partitions, that I think the stud partition, of "quartering" plastered both sides should be consigned to the past, porous and pumice bricks, breeze concrete, perforated and solid plaster slabs and solid plaster on expanded metal are all so much superior that their use should be universal even in country houses. Building the tops of chimneys in cement and the insertion of proper damp courses in them should be a matter of common practice, but I fancy more attention is often paid to the problem how to get a chimney to draw, or not to smoke, without recourse to a chimney pot, than to whether the damp course has been properly put in.

The architect who has been called in once to *try* and cure a bad case of "dry rot" in a house will, I imagine, need no reminder as to the necessity of making provision against such a misfortune arising in one of his own buildings, or one who has lived during a cold winter in a country house with no means of heating the hall or passages, he, I fancy, will bear in mind the necessity of heating arrangements, the nature of which we need not discuss. I would only say avoid any system which combines heating and a supply of hot water for domestic purposes, unless the former be of the most limited description.

Windows.—The height of rooms, the lighting of them by suitable windows, and if no fireplaces are provided, some means for the air to escape, I shall not venture to use the word ventilate in connexion with this, even the cistern rooms should be well lighted; although the water is not the better of any light. The height of the windows with relation to the floor and ceiling requires attention, many of the building regulations having claims on the subject, and it is not a pleasant experience, when a picturesque window, or, mayhap, several of them, have been arranged in the roof, to receive a polite request from the authorities to alter so as to conform to by-law so and so.

High bottom beads or rails to double hung sashes as a simple inlet for air are not made use of as often as they should; they also form a very excellent stop to prevent wet coming in at these points when heavy gales blow directly on windows, as is so often the case in exposed situations in the country.

A splayed notch on the outside of the bottom bead is an additional safeguard against water, but do not cut the notch upside down, as illustrated in a well-known work on specifications—evidently a slip, but still liable to be copied by the beginner.

I think we may now turn to the matters which are more usually known as sanitary. It is really to impress upon you how many sanitary items there are which require your personal attention and which you cannot hand over as a P.C. amount to your pet sanitary engineer. He, poor man, if he is a little above the average, may tear his hair when he finds water-closets, baths, lavatories, and sinks dotted about all over the plan, causing him the greatest difficulty in dealing with the arrangements, if (and bear in mind I say "if") you have not given the matter the consideration it requires from the first.

We shall presume all things are in order and the water-closets are grouped fairly well in one part of the building, as few outlying ones as possible, baths not over rooms where the flow of water from a quick waste will disturb the occupants of rooms below, also where, if leakages occur, as little damage as possible will be done.

All these things are in order, and we shall now consider the fittings and drains.

First of all, let me assure you that the more simple the fittings are the less future trouble your client will have, and that is a matter of some importance in outlying country districts. I spend a short time every year at a house where, if a plumber is required he has to be brought a distance of seventeen miles—about seven by rail and ten by coach. This is enough to make one careful that the taps do not require washers or the water-closets new seatings more often than is absolutely necessary.

Taking the important item of water-closets, I should advise in all cases a wash down or pedestal basin, and, in saying this, I know I lay myself open to criticism, but I have been through all the points of noise and flush and non-cleaning and comfort and habit and all the rest of it, and am still of the same opinion. As to the particular type I shall not say much. I think it should not be what is called "large area" water surface; I do not think the clearing of these is at all satisfactory, even with flushing cisterns of larger capacity than we are allowed to use in London as a rule.

I also think the basin you select should have the most simple joint to the soil-pipe that can be obtained, consistent with perfect water seal or air tightness, depending upon the position of the joint; in fact, I desire a perfect joint which any handy man can make, as the basin may be broken any day by careless use or accident. The back, of course, should be straight, and the flushing rim, if it is of that variety, should allow of a good body of water falling all round. Seats should always be of hardwood in two thicknesses, preventing the warping and cracking which seats made of one thickness are always liable to. The water-closet should be fixed so that the flushing cistern can be placed immediately over the inlet arm; the old-fashioned position back to a window is the worst for a water-closet worked with a W.W.P. or flushing cistern. The seat should either have rubber bosses fixed on the underside or iron bearers projecting from the wall, leaving the floor clear for sweeping; the hinges should be brass pivots and plates fixed to the edges of the seats at the side—not butt hinges, which are very usual. Every water-closet basin should be white; printed basins hide dirt.

One point in connexion with the W.W.P. which does not receive the attention it deserves, is the rate at which it fills. I put in specifications that it is to fill in a minute and a half, which means that with a low head of water a ¾-in. ball valve must be used, and as this costs a little more than a ⅝-in. ball valve, it is not always used when it should be. As far as my experience goes a perfect flushing cistern has yet to be invented, so I shall not offer you any advice upon the sort to use except the fewer the working parts the better. The shell, if of cast-iron, should always be galvanised; wood lined with lead are best in some situations, both on account of quality in the water, and not so liable to damage from freezing. I think a chain or for the better qualities a brass rod, *not* in a slide, the best

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form of pull, a stop cock on the water supply to each flushing cistern is an advantage when repairs are needed; the position of the arm for connecting the antisyphon pipe is of some importance, and the method of connecting the pipe to the arm when the latter is of any stoneware type, is a difficulty sometimes not satisfactorily dealt with, therefore I am inclined towards a lead trap to which the antisyphon pipe can be wiped, as the best way out of the difficulty. If a valve closet must be fixed, use a good one; cheap valve closets with flimsy parts and badly finished brass work require repairs frequently, and seldom repay for the small saving in the first outlay. A lead tray should always be fixed under these water-closets in case of leakage from the valve, with a weeping-pipe to the outer air having a copper flap at the end to prevent wind blowing up the pipe, and the same applies to the overflows from all cisterns and flushing-tanks. Care should be taken to make the wood fittings in connexion with these water-closets easily movable, and clear of plaster work and the like.

Baths.—I do not think I have any particular remarks to make as to baths. Whether porcelain, cast-iron, or copper be used, must always be a matter of individual taste; the first-named is always difficult to heat if a hot bath is required. Copper is the best in this respect, but a good one is always expensive, and requires stout cradling to prevent it being put out of shape.

The bath fittings should, in my opinion, be of ample size, so that the bath can be filled rapidly, and I lean towards valves or taps which are quite distinct, the hot supply from the cold, and the nose projecting well over the edge of the bath if not actually inside (which is a modern improvement), very useful in case the valve leaks at the stuffing box or union. Lead safes are useful where the baths are enclosed, but the best types of baths do not require enclosures, and with these lead safes are unsightly. A tile or mosaic floor being preferable, or perhaps a sunk marble slab if funds will permit.

The wastes from baths, sinks, and lavatories, should be ample in size to permit of quick discharge, and the outlets should be of sufficient area to properly fill the waste-pipe. The latter should, in my opinion, discharge into an open head outside, so that the traps may not be syphoned out. I think this a better method than having long continuous wastes fitted with antisyphon pipes.

Lavatories and Sinks.—The number of lavatories and sinks from which we can select is so large that all tastes are catered for. Those having complicated fittings should always have lead safes under in case of leakage. Enclosures are to be avoided, as they become receptacles for dirt and objectionable things in general. Every fitting of this nature should have a proper overflow. I have had considerable trouble with sinks for hot water washing-up, in cases where glazed ware was unsuitable, and have tried wood lined with lead, zinc, and tinned copper, but they all proved practically useless in a very short time, in cases where there was much washing-up to be done with hot water; 2-in. teak put together with red lead, galvanised bolts and brass screws being the only form of sink suitable for this class of work; in this case I have had the waste plugs made hollow and of sufficient height to form an overflow. Care should be taken to have a proper grating in the waste washer, which can be removed but not *too* easily taken out, otherwise it is never in its place and pipes get blocked up. Angle strainers in sinks are a useful addition in this respect, if the domestics can only be induced to make use of them.

The vexed question of housemaid's sinks should be considered; what its use should be and to what extent they should be provided. Except in large houses I consider that a water-closet should be used for emptying the slop-pails into, but when a slop sink is required it should resemble a water-closet, not have a grating or anything of that nature to the outlet; the latter are only suitable for fixing under hot or cold draw-off taps, which should be provided in the housemaid's closet; the latter should be light and airy, not, as so many are, in some corner, deficient in everything except dirt and smell. If a real slop-sink is provided it must be fitted with a ventilated soil-pipe and antisyphon-pipe, exactly as a water-closet would.

All sinks should have high backs or some other means of preventing the wall or enclosure from getting wet; slabs of marble, tiles, rendering with Portland cement, all answer the same purpose. No space for water to trickle down should be left behind sinks of any description.

Traps.—Usually of drawn lead, should be fixed under *all* fittings; with brass cleaning screw, the latter having a square or oblong projection for unscrewing, *not* a couple of small holes, or an indentation requiring a special tool to unscrew it. A little time ago, I spent an hour with a plumber getting out a screw cap to a sink waste; if it had had a projection to fit a spanner, it could have been removed in one minute.

With regard to fittings generally, there seems to be a great laxity amongst men who do this class of work—both those who specify and those who execute—as to connexions between fittings and lead pipes; these should always be made with "unions and flynuts;" as a rule, the "union" portion is omitted, say, for instance, connecting a stop-cock; more often than not, both ends are simply "tinned" and the joints wiped; so that to get the cock off for repairs, the pipe must be cut in two places, and two new joints made when it is refixed. If proper unions were fitted in the first instance, they could be unscrewed, screwed up again without damage to pipes or fittings, or a useless expenditure of time. I shall only direct your attention to one other point in connexion with fittings, the word "self-cleansing," now in such common use. It would be well if all architects and, indeed, their clients also, would understand that this term does not mean that the particular fitting will keep itself clean, but that there are no corners, or angles, or the like, where dirt can accumulate. Baths, lavatories, sinks and water-closets particularly require "elbow-grease." The daily application of a closet-brush to water-closets would prevent such filthy traps as are on exhibition in too many houses of even the better class.

The supply of water to any house, country or otherwise, is a matter which should receive careful attention, but more particularly in the country. Very often the difficulties are increased by the supply being limited from various causes, such, for instance, as want of power to pump the water up to the required level. This is too large a matter to deal with to-night, beyond saying that the Canadian type of windmill, hot air, and petroleum engines, and also the hydraulic ram, all serve the purpose when natural gravitation is not available.

Pipes for water service should be considered, with regard to the nature of the water, particularly in some localities where both the water and the earth may cause deterioration of lead, the water thereby being contaminated occasionally. I show you a piece of lead pipe taken from a house near Bedford some time ago, the exterior eaten away by some action of the earth in which it was laid, some hundreds of yards had to be renewed in this case. I laid some lead pipes in the neighbourhood in trenches which were filled with sand and gravel, with which the pipes were surrounded to prevent damage from the above cause. Lead lined with tin, or iron lined with glass are very good, but are expensive, and the former require special joints. The storage of water is, of course, a debated point. Personally, I am for storage, as I consider it can be carried out with very little fear of contamination, and it saves many a trouble when there is a hitch in the supply. In a country house, a supply of water for drinking and cooking purposes can be stored in a glazed stoneware tank (if a slate or galvanised iron one is not considered good enough), either white or buff, which, with occasional cleaning, is about the most sanitary article which can be obtained. The general supply can be stored in a galvanised wrought-iron cistern, or cast-iron, or steel plate. If the size is large the wrought-iron should never be less than ⅛ in. in thickness; many are so thin as to be useless in a very short time. I have found it an advantage when a galvanised cistern is used to have it thoroughly cleaned out when all the connexions are made, and then to paint the inside twice with Portland cement, mixed with water to about the consistency of paint; this preserves the galvanising and covers many of the little projections left in the process.

I need hardly remind you that close-fitting covers to the cisterns are essential; that the cisterns should, if possible, not be placed where the water is liable to freeze in cold weather. Near a chimney is a good position, other matters being equal. Ease of access should be considered for cleaning out, and safes under are always advisable in case of accidental overflow. The position of outlets deserves attention. They should always be in the side of the cisterns, so that dirt cannot get down the pipes, and if a supply is taken off for hot water, it should always be taken out of the cistern *below* the general cold water supply, otherwise there is danger of leaving the hot water system without water in times of scarcity. Stop-cocks, with unions and large wheel-heads, so as to be easily turned, are necessary. Wrapping the pipe with slag wool made upon canvas is desirable, and where casings are fixed they should be easily removable, not nominally so, as is so frequent. One further point with regard to cisterns. There are some on the market which are intended for use as a reserve only, the supply under ordinary circumstances coming direct from the service-pipe and not passing through the cistern. I am not in favour of this arrangement, as the water might be in the reserve for so long a period that its use might be undesirable. I think we may now turn to the soil pipes and drains, dealing with the former first. Naturally lead is the most suitable material, except in cases where large quantities of hot water alternating with cold have to be dealt with; under these circumstances cast iron is more desirable, as the lead is buckled and at times cracked by the alternate heating and cooling. The connexion of the foot of the soil pipe to the drain is often not carried out as it should be; if the soil pipe be 3½ in. in diameter, and there is no necessity for it being larger, the brass tail pieces usually sold have such a narrow flange that it will not bear on the collar of the pipe, but slips right down; a wide flange bearing all round on the stoneware socket should be specified and insisted upon; the tail piece should be lined with the lead pipe the whole length, the latter dressed over the flange all round, and the joint wiped round the top edge; the whole length of the tail piece should show above the ground level, and the joint to the drain be made with cement well flaunched and trowelled hard.

A sufficient number of tacks should be put to lead soil-pipes, not less than every 5 ft., in pairs on both sides; bends should, of course, be avoided where possible; the soil-pipes should be carried up to a sufficient height to ensure the gases coming from them being taken away clear of windows and ventilators, but *not* up the side of chimneys finishing close to the chimney-pots, in which case there is a great probability that as the air from the drain comes up the ventilating-pipe it will go down the smoke flue, in many of which there is a down draught except during the time there is a fire actually in the stove. Guards of some sort should be fixed on the tops of soil-pipes to prevent birds building, leaves, &c., getting in. Branches into soil-pipes should be arranged so as to avoid joints being in the thickness of walls, and the connexions of water-closets to the branch pieces should be carefully attended to. So much has been written about drains and drain-pipes that I fear you will be weary of the subject. As a rule the drains are a simple matter, if one only could get perfect joints, and it is to improve these that so much attention is directed at the present time. Certain points should always have careful attention; for instance, where there are separate soil and rain-water drains the former should always be laid below the latter. If the rain-water be stored for use, the joints of the pipes conveying it should be most carefully made, as it is possible for water to get *into* the pipes from the surrounding earth, as well as to get out and the quality of that getting in, may be very objectionable. One of the chief difficulties in laying drain pipes is to get a true alignment at the joints, so that each pipe may be quite concentric with those adjoining. With the ordinary joint this is a matter entirely depending on the skill of the individual who lays and joints the pipes. The cement exuding when the pipes are pushed up together is another difficulty; careful wiping out of the pipes at each joint being the only remedy for this most frequent defect. To obviate these difficulties some use gasket or hemp bound round the end of the spigot, to make the end of the pipe fit close and concentric; but I think the pipes with a ring of composition on the spigots and sockets and a cement joint outside is the best method of avoiding difficulties of this nature and taking a great responsibility off the man who actually lays the pipes. The con-

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crete on which the drains are laid is a matter on which much difference of opinion exists. One of the latest text-books advises a bed of concrete about 6 in. thick, laid to a regular fall, on which the pipes are to be laid, the space under the body of the pipe then being packed up with concrete. I do not consider this a good plan. I suggest that a bed of concrete 6 in. or 8 in. thick be laid with indentations at regular intervals for the collars of the pipes, allowing room enough to make the joint. The whole length of the pipe bearing on the concrete render the lengths much less easily knocked out of position by accident. When each length is completed a benching at the side, up to about the middle of the pipe, is sufficient. Except to resist external damage, there is no object to be gained in surrounding pipes entirely with the ordinary concrete, which is of too porous a nature to keep in any sewer gas or air which may escape from defective pipes or joints. Of course if a pipe, surrounded with concrete, say 18 in. or 20 in. square, is to be looked upon as a beam, then it is superior to a pipe with benching up to its middle only; but I think we should always try and get a sufficiently good foundation for our drains to enable us to abandon the beam theory. It is, of course, necessary to protect pipes from shocks of heavy vehicles passing over them and such like. The concrete should be properly made with clean material, and where the earth falls in upon it when the pipes are being laid, it, viz., the earth, should be carefully cleaned off the surface before the additional layer of concrete is put down, otherwise there will be two distinct layers not connected with each other.

I do not think I need trouble you with any remarks as to the size of drains, their inclination, whether they should be stoneware or cast-iron, these are more matters of office routine which can be decided to suit the circumstances of each particular case. If we turn to the construction of manholes or inspection chambers, a few remarks are necessary. If built of bricks I do not consider footings necessary to the walls; in ordinary earth, a slab of concrete extending to the external face of the wall is sufficient. I prefer rendering the interior with Portland cement, to the white glazed brick; the joints in the latter take away any benefit gained by the glazed surface of the brick. Some say that hot water damages the rendering, but as hot water does not often rise above the benching, I have not found the damage occur; the benching should be steeper than is usual, and of a convex section, so that the solids washed upon the inclined surface may slide into the central channel. The objection as to this form being inconvenient to stand upon and so on, need not be considered. Manhole covers should always be galvanised, it is quite worth the extra cost. In the country where every manhole would be out of doors and not close to the house, the airtight quality of a cover is not of so much importance as it is in towns. Turning to what is usually called the "air inlet," I think that unless it can be placed in an unfrequented position, it should always be carried at least 8 ft. high, without any mica flap or valve of any sort, these are a delusion, they get out of order so easily, and their use as at present in towns, will not continue very long. It is an accepted fact that there is an up current in most ventilated soil-pipes under ordinary circumstances, but where a water-closet on the soil-pipe is used, it reverses the current for the time and drives the air out at the first available outlet, which is usually the so-called "inlet." For this reason, particularly in towns, the inlet should be carried up above all windows and the like, but in the country, a pipe the same diameter as the drain taken up say 8 ft. with a bend and wire guard at the top to prevent leaves and so on getting in, is quite sufficient, perhaps more than sufficient some will say, and advocate a grating, say 18 in. square, close to the ground level. I need hardly remind you that overflows from rainwater tanks should not, under any circumstances, be connected to soil drains, nor do I think surface water drains should, even with traps fixed on the outlet, unless some length of open channel intervenes between the trap on the surface water drain and the connexion to the soil drain.

Sewage Disposal.—In many districts the disposal of the sewage of a country house is a great difficulty where there are no sewers in the neighbourhood and the pollution of streams is very properly objected to. In such cases it is perhaps desirable to consider the advisability of having a separate system of drains to take the wastes from baths, lavatories, and fittings which do not take solid filth; with a tank, the contents of which can be used for watering gardens and the like, this would greatly reduce the amount of liquid to be dealt with. The sewage, or excremental filth portion, can then be dealt with by some of the forms of bacterial treatment, known by the various names of bacterial filters, septic tanks, and such like. From what I have read on the subject, it seems to me that the treatment should be a form in which the sewage is passed first through a closed tank, and then through filters exposed to the light. Time will not permit me to go into the various methods advocated. I would remark that I heard of the arrangement now known as the bacterial tank from a member of the Architectural Association a good many years ago, as Mouras' Automatic Scavenger, a description of which can be seen in the Proceedings Institute of Civil Engineers:—

Vol. 68, page 350, 1881-2;
Vol. 72, page 359, 1882-3;
Vol. 78, page 502, 1884.

From these notes I had a scavenger constructed in the latter part of 1893 at a private house I was then building, in the hope that it would render the sewage less offensive. This it has done most effectually, and although I cannot claim for it that the effluent is by any means clear, it is not offensive. The tank has never been touched during the last eight years, and the last time I examined the drains they were quite clear and no solid matter had passed out of the chamber, showing that the solids had been broken down as anticipated. Since then I have advocated its use at my lectures on sanitation, and I know other tanks have been installed from the advice I gave, so that no patent rights can be claimed for this portion of the arrangements which are now before the public. I show you a diagram of an arrangement enlarged from a sheet exhibited at the Sanitary Institute. The original sheet is prepared by the Worcestershire County Council for the assistance of those persons in that county who wish to make trial of such method of sewage treatment. The only difficulty is the great fall required from the inlet to the outlet, the total being 6 ft. 6 in.; various arrangements are illustrated on the original sheet, but I have only enlarged one, showing a liquefying tank and aerobic filters, suitable for a house of fifteen persons at twenty gallons per head, equal to 300 gallons per twenty-four hours. It has always seemed that some precautions should be taken against freezing in an installation of this nature. I have heard of one "Automatic Scavenger" (Mouras' name for the liquefying tank) being frozen up; it would be very inconvenient indeed if such should be the fate of some erected by our members; this is one of the points to be thought out.

I do not suppose any paper on the sanitation of a country house would be complete without some remarks on the dry system. A properly situated and arranged earth-closet is a most sanitary adjunct to a country house, no matter what class it may be intended for. Everything good in this world requires attention, and because the earth-closet requires, perhaps, a little more attention than people care to bestow upon it, it has got into bad repute. I speak now of outdoor—and shall we say isolated—earth-closets. If each country house was provided with an earth-closet constructed on the lines advocated by Dr. Poore, in his books, "Rural Hygiene" and "The Dwelling-House," I imagine some of the difficulties of sanitation would be got over, and some of the dangers from the want of it would never arise. I refer, of course, to the "dry catch" system, the principle of which is that the floor on which the excreta falls slopes towards the outside, allowing the urine to run into a receptacle filled with mould, and so the excreta is left dry, in which state objectionable gases are not generated. The usefulness of this arrangement depends, of course, upon regular attention—I do not say daily attention, as I intended to do at first, but regular. The difficulty is in getting people who will go just a little out of their usual course to obtain what will, no doubt, have beneficial results, the latter being to the people concerned not quite apparent. I can only commend to your attention the books of Dr. Poore, as you ought to know something of this method even if your clients cannot be brought to adopt the system advocated. I also suggest for your perusal an article in *Country Life* in the number July 6, 1901, called "An Experiment in Sanitation," written by Dr. Poore, which deals in a most admirable manner with the storage of rainwater, and the disposal of slop-water and excreta, suitable for cottages.

Now, gentlemen, I have concluded, not because I have exhausted the subject, but because I was particularly asked not to make the paper too long, and also for the very good reason that I wish to leave time for a discussion, during which I hope that I amongst others may obtain some valuable information. I have tried to bring before you some points which are usually admitted as essential to the sanitation of a country or indeed, any house, but which I find require a great amount of supervision to ensure their being done properly, and as the very essence of sanitation is thoroughness in every small detail, I commend it to your most careful consideration, with the final remark that one of our objects should be to try and obtain "The most perfect action of body and mind during as long a period as is consistent with the laws of life; in other words, to render growth more perfect, decay less rapid, life more vigorous, death more remote."

The Chairman, in inviting discussion, said that Mr. Max Clarke might set his mind at rest; they had not wasted their time that evening.

Mr. Thomas Blashill said he desired to propose a very hearty vote of thanks to Mr. Max Clarke for a very valuable paper, which dealt very fully with many important matters. As to the difficulty of getting drains put in properly, he thought that workmen were getting more reliable than they used to be; perhaps because architects and builders were getting to know better what they wanted. He had felt disheartened at times to find that it was not sufficient to stand on the brink of a trench to see whether the workmen were carrying on the work properly. Once a very good builder said he would set some bricklayers to do the drains, as they would take more care. He with the builder watched the men lay a certain length of the drain, and while doing so he noticed that the "cement" being used was nothing but earth, for although the men had a bag of cement, they were using earth in order to economise their master's material. The testing of drains by the sanitary authority or by the architect would make such an attempt impossible. Mr. Clarke had mentioned certain difficulties in regard to basement-floors, or the lower floors of houses. He (the speaker) had not in the last twenty years put a wooden floor down as the lowest floor of a house with a space underneath; it was a great mistake to do anything of the kind. What should be done was to put coke breeze on ordinary concrete down and to nail the boards to that, and if this were done, ground air, rats, or things of that kind would be prevented from getting through. The boards should be treated with some of the three or four solutions which were on the market—Burnett's, for instance—but if that could not be done they could still nail the boards down without treatment. The boards should not be too thick, and if, or when, they wore out they could be replaced. As to dry-rot, he had seen it in the upper floors of houses, which floors had been pugged in the ordinary way, and where the boards had been nailed down too soon. Dry-rot was likely to attack in such circumstances, and if the rot could be discovered in time, it was a good and successful treatment to scrape the whole of the fungus off, and, with some Burnettising solution, thickened with whiting, cover the whole of the affected parts thick with it. In his experience that treatment, if adopted in time, was a cure. As to air-bricks, if they were relied on to ventilate a space under a floor, they were useless, for they always got stopped up; besides, they were useless if they were not stopped up. As to iron ventilating pipes for closet pipes, the usual result of using those pipes was that so much rust fell from them that the bottom was blocked up. He was strongly in favour of overhanging eaves. He had not done much in the way of hollow walls, but he had seen a great deal of such work where the damp came in under the flashings of the roof, against the outer wall, and he thought it was better to have solid walls. Overhanging eaves entirely stopped anything of the kind he had referred to happening. As to Mr. Clarke's remarks about the sewage disposal of a country house, he did not think the lecturer had

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gone into the matter exhaustively. To put sewage into a pipe was not disposing of it; the difficulty began when they commenced to dispose of it. The Local Authorities would not allow it to be put into ditches which ran into cow ponds, and if it were put on grass where cows grazed, and the soil was not perfectly porous, the effect on the cows was disastrous after a time, as abortion was brought on. That might happen to two or three of the cows, but sometimes half or two-thirds of a herd were so affected. He was perfectly satisfied that in country cottages there should not be drains or sinks or anything of the sort. He was satisfied that every kind of slop produced in an ordinary country cottage with a garden could and should be disposed of in the old-fashioned way of putting it on the garden or giving it to the plants. Directly it was put into a tank or sink there was more or less trouble, but if they threw it on to the cultivated land it was done with. We ought to have more confidence in the purifying power of earth, and slops and excrement, if disposed of in this way, were never seen again. They should not put the stuff in pits, for the microbes which dealt with it were on the surface, and they would keep there if food was put there for them. The same with earth-closets; he had had great difficulty in getting them managed in a sensible way. The machinery of the closets did not work well sometimes when the closets were put down; people wanted to use ashes, instead of earth, and they might just as well use marbles. Ashes blotted up the moisture, but they did not deodorise. Dry earth was not suitable for earth closets, for it did not absorb the liquid as did a slightly damp earth taken in its natural state. The soil should not be buried deeply; all that should be done was just to cover the soil. As to the "automatic scavenger," a client, who had a large house very fully inhabited, told him that it acted splendidly, and he (the speaker) thought they would do well to give attention to it.

Mr. P. Gordon Smith, in seconding the vote of thanks, said a good deal had been said about Portland cement. They all knew the eccentricities of that material, and he had come to the conclusion that stoneware drains were not to be relied on, because the cement at the joints often split the joints of the pipes, and he had made up his mind to have nothing to do with stoneware pipes, but to substitute heavy cast-iron pipes with Angus Smith's solution on the inside. Such a pipe had many advantages over the stoneware, particularly in the fact of having one joint to three or four in the stoneware pipes. He was once concerned in the laying of some stoneware pipes; he saw the work being done and he knew it was performed in the best manner possible, and yet eight years after it had been completed nearly all the pipes leaked and had to be taken out and iron ones substituted. He had come to the conclusion that the iron pipe was the pipe of the future for all drain purposes. As to covering the area of the site of a building with concrete, that was an excellent plan if properly done. He knew the need of it, for he had seen a house in a Staffordshire village which was built above some disused coal mines. Some coal got ignited, and products of combustion arose from the earth and got into the house in cold weather when the ground outside was frozen and hard, and nearly killed all the family. Catching rain water was an important matter in villages where there was no water supply, but the collection was apt to be very objectionable if not properly done. It was a common practice to put gullies under rain-water pipes, whether they were wanted or not, and these gullies received all sorts of things besides rain water. Servants cleaning the house-step put slop-water into the nearest gully, and gullies were often used as urinals, and he had known of a case where serious results had followed from drinking water from a rain-water tank which had been receiving slop-water without anyone noticing it. Gullies ought not to be put where rain-water drains were connected with a tank; the down spouts should be connected directly with the rain-water drains. Copper baths were excellent things in their way, but he had had his notice directed to some copper baths in a hospital where the labour of keeping them clean was very great—almost prohibitive. If the baths were enamelled it was all right, provided the enamel did not come off in a few years. He had rather peculiar views about baths, for he thought they were more or less luxuries. One did not require a bath necessarily to keep clean; that could be done with a tub and a couple of gallons of water; but it was nice, it was a luxury, to recline in a bath at full length; but where there were a number of people taking baths, it meant an enormous consumption of water and appeared to be an extravagance. Spray baths, which were made in considerable numbers, were excellent things; comparatively little water was used, and the time occupied in using them was also an advantage. The hot-water supply to baths was another trouble, especially in private houses where two or three successive baths were wanted in the morning; there was great difficulty in getting hot water. As to cisterns, he thought it would be wise to bear in mind that they were more useful if they were in duplicate. If there were two cisterns, one could be cleaned out or repaired without interfering with the supply of water, and that was a great advantage. As to cesspools, he did not think they should be allowed anywhere, not even in the country. Sewage ought to be disposed of on the land or by sewers; cesspools were an absolute nuisance and ought to be prohibited.

Mr. E. O. Sachs said he would like to say a word or two arising out of Mr. Max Clarke's remarks as to the seriousness of the fact of the rising generation of architects growing up without a proper feeling of responsibility in these matters of sanitation. He (the speaker) was afraid that younger members of the profession were too liable to make use of those wonderful institutions called sanitary associations which, for two guineas, looked after these sanitary matters. Some architects of the rising generation shirked their responsibilities in these matters, and did not enjoy the sanitary side of architecture. It was most necessary that the young architect should take up the sanitary side of his work in a far more serious manner than he often did. It was also a matter of regret that it was so difficult to obtain from the ordinary country builder a sense of responsibility. The country builder performed his work in a most dilatory manner, and only recently he (the speaker) had had experience in Kent and Surrey where the builders had done their work in a most slovenly way. The architect, especially the London architect, could not watch everything that was being done, and many jobs did not justify the expense of a clerk of works, or of an assistant being constantly sent to supervise; and in such cases the builder was left to a great extent to his own devices, and it was unfortunate that, quite irrespective of any question of deductions for faulty workmanship, or any question of reconstruction, there was no legal punishment for bad work.

Mr. W. E. Hewitt, in supporting the vote of thanks, asked if the lecturer knew of a satisfactory method of turning bath and sink waste into the gully, giving 18 in. of open channel such as the local by-laws required? The most successful he knew of was the Albion clay slipper, which discharged underneath the grid and had 12 in. or so of open channel. He quite agreed with what had been said as to earth closets. Ladies as a rule objected to them because there was so much dust, but that was when ashes were used. There was a difficulty as to upstair arrangements when earth closets were used, but that could be overcome by the use of commodes.

Mr. F. G. H. Hooper said that the rather obvious remedy for Mr. Sachs' difficulty as to scamped drainage work was to see the work before it was covered up.

Mr. E. Greenop said that in choosing a water-closet pan one had to be very careful that the arm provided for anti-siphonage was in such a position that the soil would not be washed up, and the more up-to-date sanitary authorities were condemning closets of good makers on this ground. He thought that labels should be put on all cocks, especially in a large house. One difficulty as to stoneware drain-pipes was the frequency of the joints; he had tried to get 3-ft. pipes instead of 2-ft. ones, but he found it was difficult to do so. Diameters of drain-pipes for ordinary houses were, in his opinion, always too large. He could confirm Mr. Clarke's views as to the inadequacy of the size of gully grids tested by observation in heavy storms. He had also put a filled gully in his house in London and in ordinary weather and without a fire the water had dried up in a fortnight.

The Chairman, in putting the vote of thanks to the meeting, said that Mr. Clarke might have said a little more about septic tanks. Clients still seemed to regard the septic tank as if it were in its preliminary trial stage, and in one case he knew of ordinary cesspools had to be provided simply in order to get over a client's misgivings. He thought the suggestion as to duplicate cisterns was a very good one, and by having two flat cisterns they could be arranged quite close to the eaves, and did not take up so much space. With regard to sinks in housemaids' closets, it was always a difficult matter to know what to do to provide a sink such as housemaids required, and he asked Mr. Clarke if he could give the members any further advice in this direction. The whole paper, in his opinion, went to show that an architect should not be dependent upon others in these matters, but should become more or less a sanitary expert. It was no good designing the house beautiful, or to devote time to fumigating the oak to perfection, if an error was made in the sanitation, and if the drains were to be badly arranged, it would be better had the house not been built.

The vote of thanks having been heartily agreed to,

Mr. Max Clarke, in the course of his reply, said he quite agreed with Mr. Blashill's remarks as to overhanging eaves. As to sewage, he put it into a pipe and then on to the land, and he found that the cows were not affected in the way Mr. Blashill had described. As to the automatic scavenger, he had put one in for the Church Body of Ireland when building a rectory for them. They were sceptical as to its utility, and he asked them to allow him to put it in at his own cost, as he had such faith in it. They agreed to that, and five years afterwards, the automatic scavenger having answered so well, he received a cheque for the work. If any one went to the septic tank manufacturers and asked for a sample of the effluent, the gentleman who had the matter in hand would pour out a portion of the effluent and drink it, and surely the Local Authorities would not object to such an effluent as that going into the ditches.

Mr. Blashill, interrupting, said his objection was as to the raw sewage being put upon the land. The septic tank or the scavenger was a cure.

Mr. Clarke, continuing, said Dr. Poore's book and paper were emphatic as to the disposal of excreta in the earth, but it was no use whatever to bury it 3 ft. deep; they might as well make a lot of little cesspits with it. The nearer the surface the excreta was put, the more effectual was the action of bacteria, which required air, and unless they got it the excreta would merely get into a state of sliminess. They might discuss drains, and the importance of making them good, until Doomsday. There was no building in the world that could not be made absolutely drain-tight if people would only start in the proper way. There was a notion that the only way to put down drains was to put in stoneware pipes or pipes which were correct when laid. The Science Committee of the Institute of Architects were, to some extent, instrumental in getting the County Council to adopt pipes with flange joints, and if iron pipes, coated with Angus Smith's solution, were used, there need be no difficulty about the drains. When people wish for an installation of hydraulic power or a steam engine the engineers never suggest that there may be a difficulty as to the supply on account of leaky joints, although one main may be under a pressure of 700 lbs. and the other 500 lbs. to the square inch; why then should there be any difficulty about drains which would last ninety or 100 years, and which it would be impossible to get any air through, even if the pipe were put under a pressure of 100 lbs. to the square inch. As to sinks, it was not an uncommon thing in better class houses for sinks to be used as urinals by the footmen and butlers; consequently, the fewer sinks there were the less would there be any of that sort of thing. As to bad workmanship, that could be dealt with by keeping back some of the money, and, if the work were not carried out satisfactorily, not to pay that money. As to making soil-pipes too large, he had a piece of lead pipe the bore of which was nearly stopped up by deposits. The by-laws of the L.C.C. gave a definite method for the anti-siphon pipe to be turned into the arm of the closet, *i.e.*, that it should be turned into the arm in the direction of the flow. A teaspoonful of salt would prevent the evaporation of water from gullies, but people could not be got to attend to that detail.

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If more care and cleanliness could be instilled into the ordinary housemaid, any sink would do, but as that could not be done, the only sink that was possible was one so arranged that it did not matter what was put down; it must be sufficiently large to take all sorts of things. In New York, when any sanitary work was contemplated, careful drawings had to be submitted to the authorities, and that was what would be required in this country before long. Every pipe and trap had to be shown, and the sooner that was required here the better.

The Chairman announced that the next meeting would be held on the 20th inst., when Mr. Arnold Mitchell would deliver an address on "Capitals," illustrated by lantern views. Mr. Mitchell had consented, at short notice, to take Mr. Bond's place that evening, as Mr. Bond, who was to have read a paper on the same subject, was unwell.

The meeting then terminated.

BUILDERS' BENEVOLENT INSTITUTION:

ANNUAL DINNER.

THE fifty-fourth annual dinner of the Builders' Benevolent Institution took place at the Hall of the Worshipful Company of Carpenters, Throgmorton-avenue, E.C., on Thursday, the 14th inst. Mr. J. Carmichael (President of the Institution) occupied the chair, and amongst those present were Mr. G. H. Fellowes Prynne, F.R.I.B.A.; Mr. J. Howard Colls, Mr. D. Duff, Dr. R. R. Oram, Mr. W. B Brown, Mr. K. D. Young, Mr. T. H. Brooke Hitching, C.C.; Mr. A. Ritchie, C.C.; Mr. W. Gillbee Scott, F.R.I.B.A.; Mr. E. P'Anson, F.R.I.B.A.; Mr. H. N. Lancaster, A.R.I.B.A.; Mr. J. Gibson, A.R.I.B.A.; Mr. H. T. Hare, A.R.I.B.A.; Mr. J. Wigley, Mr. A. Masson, Mr. F. Farquharson, Mr. B. P. Ellis, Mr. A. E. Parker, Mr. B. Woodward, Mr. J. Scott Balfour, Mr. H. Holloway, Mr. R. J. Greenwood, Mr. H. H. Bartlett, Mr. J. Randall, and Mr. T. Rider. The company numbered altogether about 200.

After the usual loyal and patriotic toasts,

The Chairman proposed the toast of the evening, "Success to the Builders' Benevolent Institution." He pointed out that the object of the charity was to relieve men who had been builders and in business for at least ten years, whose age must not be less than fifty-five, whose character would bear the strictest scrutiny, and who were now in poverty and want. He had often thought, had he been a Carnegie nothing would have given him greater pleasure than to search for and find out the thousands of poor but honest tradesmen scattered throughout the length and breadth of our land, so that he might help and assist them. He believed there was no more deserving class of men, and none who would more highly appreciate a little financial aid. The cause was a good one, and, whilst they were exceedingly grateful for all donations received, he wished to make a special appeal to all London builders to help this deserving charity by becoming regular annual subscribers. This was essentially a builders' charity, and ought to be supported by builders. Our merchants did nobly, but he regretted he could not say the same of some of our builders. The annual subscriptions had fallen off considerably this year, but he hoped they would make up the deficiency that night. The funds were administered with the greatest possible care, and at a minimum of cost. It might well be written over the doorway of the committee-room "No impostors need apply!" In conclusion he asked the company to remember the words of his fellow countryman, Thomas Carlyle, "I pass through this world but once; therefore any good thing that I may do, or any kindness that I may show, let me do it now; let me not neglect it, as I shall not pass this way again."

The other toasts were, "The Worshipful Company of Carpenters," proposed by Mr. B. J. Greenwood, and responded to by Mr. John Wilson, J.P., the Worshipful Master of the Carpenters' Company; "The President," proposed by Mr. A. Ritchie, J.P., C.C., and responded to by the chairman; "The Architects and Surveyors," proposed by Mr. J. Howard Colls, and responded to by Mr. G. H. Fellowes Prynne, F.R.I.B.A., and Mr. W. Blumfield Brown; and "The Vice-Presidents, Committee, and Stewards," proposed by Mr. Henry Holloway, and responded to by Mr. E. J. Lough.

During the evening the secretary, Major R. A. Brutton, read the list of subscriptions and donations, which amounted to 1,010*l.* 3s. The President's list showed a total of 948*l.* 17s. 6d., towards which the President himself contributed 105*l.*

COMPETITIONS.

MUNICIPAL BUILDINGS, WALTON-UPON-THAMES.—The first premiated design in the Competition for Municipal Buildings, &c., Walton-upon-Thames, is by Messrs. Mackintosh & Newman, Birkbeck Bank Buildings, Holborn. The second premiated design is by Mr. Geo Sedger, Great James-street, Bedford-row, and the third by Mr. Sidney Tatchell, Chevening-road, North Kensington, W.

POOR LAW HOSPITAL FOR EXETER.—At the weekly meeting of Exeter Board of Guardians on the 12th inst. the question of a new hospital was considered. Canon Hobson moved "That architects be invited to provide plans for a new hospital for 150 beds at a cost not exceeding 80*l.* per bed. That the hospital be built in sections as circumstances may require or permit, and that the first section, comprising administrative block, labour wards, isolation wards, and children's wards, be taken in hand as soon as arrangements can be made." Mr. Letheren seconded the resolution, which was carried. Mr. Munro gave notice that at the next meeting he should move to rescind the resolution.

ARCHITECTURAL SOCIETIES.

THE MANCHESTER SOCIETY OF ARCHITECTS.—At the monthly sessional papers meeting on the 14th inst. (Mr. Darbyshire presiding) there was an exhibition of students' drawings, and the following prizewinners were announced:—Design for a small plunge bath, Mr. Gerald Salamons. For the sketches in connexion with the summer visits—1st prize, Mr. Frank Osler; 2nd prize, Mr. Gerald Salamons. For measured drawings—1st prize, Mr Claude Paterson; 2nd prize, Mr. Gerald Salamons. Afterwards Mr. Paul Waterhouse read a paper entitled "Architecture Among the Modern Arts." Mr. Waterhouse said he took it to be an axiom that the greatest periods of historic art had been those in which there was no consciousness of art; that, in fact, consciousness in art was a danger to its existence. He would during his paper inquire whether we were to look upon the modern practice of analysing the very nature of art as a necessary menace to our powers of art production. Our age was above all, he said, an age of expression, and in architecture especially the powers which made the critic were, he thought, allied to those which made the producer. In fact, the very mental exercises that enabled us in these days to define and detect that essence of art which was unnameable to our forefathers were not necessarily destructive of creative skill, but might be turned, at least so far as architecture was concerned, into the instrument of a riper, fuller, and more intellectual creation. After speaking of the simplicity which underlay Greek art, the beauty of some of the best specimens of Roman architecture, and the buildings of the Italian Renaissance, which last, he said, breathed the very essence of art, the speaker emphasised the fact that art as we understood the word was never talked about by their builders. In the great Gothic days the mason was a skilled craftsman, who was imbued with a simple pride in his work, which was to him an expression of pious faith and Christian belief; but the mason would have been quite unable to talk about his work. Until the present age art was cherished and beloved, but never talked of. We had, however, to-day the wish, and sometimes the ability, to express things which a former age would never have attempted to handle. Each preceding age had a style of architecture of its own. To-day an unconscious selection was exercised, but all noble work had its traditions in recognised styles, and was more or less the result of an academic choice. No architect to-day could consider himself equipped for his work without a sound knowledge of the elements in which he worked. So far from being choked, as some argued, by deeper insight, the architect must necessarily be a student. He attained the highest possible to him only when he could criticise his own work in the light of knowledge. Architecture was, so to speak, the application of taste to construction, therefore only the man of wide knowledge could be trusted to vary or modify the old rules, since his power to judge depended upon his knowledge of the work of his predecessors. Architecture was creative and arose from the divine in a man. As its name implied, it was the queen of crafts; the architect was not an imitator, but a creator.

NORTHERN ARCHITECTURAL ASSOCIATION.—The opening meeting of the winter session of the Northern Architectural Association was held at 36, Northumberland-street, Newcastle, on the 13th inst., Mr. Frank Caws, F.R.I.B.A., presiding. Mr. Wm. Glover wrote resigning his position as a member of the Council of the Association, stating that the health of himself and wife was far from satisfactory, and that, therefore, he had decided to leave this district and to reside in the south. The President and Hon. Secretary (Mr. A. B. Plummer) expressed their regret at the severance. The President then delivered his inaugural address, in the course of which he said:—The nineteenth century will be distinguished by the future architectural historian as the most fickle century of all, in regard to the number, variety, and incompatibility of the styles and fashions of buildings which it has so restlessly and inconstantly first embraced and then spurned. During this fickle century the Battle of Styles has been fought to a finish, not of the "final issue," which never can be finished, but to a finish of the two contestants, the old Classic and the resurrected Gothic, which entered both on the fray, and neither of which has survived. "As dead as Queen Anne" is an expression which has passed into a common by-word; yet it is remarkable that if there is any distinguishable survivor of the architectural fights of the great Victorian age it is the Queen Anne type, which still possesses much vitality, and seems to enjoy a fair prospect of extending its influence far into the twentieth century. Regarding the future of British architecture, we need not ask, "What will the end be?" For there will be and can be no end to the mutable fashions affected by restless humanity. Signs are not wanting that the rising generation of architects, to whom the twentieth century belongs, are coming to regard an intimate acquaintance with structural principles as a *sine quâ non* of professional proficiency; for not merely statics, but also dynamics, are now included in the curriculum of the preliminary examinations which even novitiates must pass ere they can take rank merely as students of the Royal Institute of British Architects. The truly successful modern architect must of necessity be an artist, scientist, and commercialist, and withal an excellent society man, all rolled into one. The popular measure of success is not supreme technical skill, is not even genius itself—that gift from the Highest to the highest—but is gold. This debasing influence reveals its presence amongst us by an increasing disposition to bribe clients to employ us, by offering our services at rates of remuneration below the rates fixed by usage, and by which every member of the Northern Architectural Association and of the Royal Institute of British Architects, to which it is affiliated, is bound, in honour and fairness to his professional brethren, to firmly adhere. To what extent these nefarious practices obtain amongst architects it is not easy for the clean-handed to discover, even if wishful to probe foul waters. Too many modern attempts at originality in architecture issue in mere oddities and vulgar sensationalism. Cruel contortions of gable copings and pediments, coupled with rustication carried to absurd excesses, are having a run just now. But the public taste, though strong enough to enjoy almost any architectural novelty, however vulgar, will become soon nauseated with such wretched fare. Nature's method of originality is worthy of our highest emulation. She knows how to be unfailingly interesting, and perpetually original, within the limitations of type. For example, in her reproductions of the human face divine she never makes two alike. Every human face possesses individuality, *i.e.*, originality. Yet the number and arrangement of the features are the same in all cases, the greatest differences of individuality being due to the smallest and most subtle variations. Nature's originalities are produced not by such horrible expedients as putting eyes in foreheads or by other monstrous transpositions of features, but by the most exquisite touches of ineffable art.

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Illustrations.

VICTORIA MEMORIAL DESIGN.

WE give this week the plan of Mr. Ernest George's design for the Victoria Memorial, with the view of the ornamental *place* near the palace, and a view of the triumphal arch at the east end of the processional road.

We have already commented fully on the design in our article of the 2nd inst., and the architect has no special remarks to offer.

In regard to the arch, or rather gateway screen, while we think it a very charming composition, we may observe that it conveys more the idea of being an entrance to a park than a royal or national triumphal arch.

HOUSE, BARNT GREEN, WORCESTERSHIRE.

THIS house was designed to command the extensive views of the Avon and Severn valley from the Lickey Hills, the site falling rapidly towards the south. The materials proposed were Bromsgrove stone, rough-cast, old brick chimney shafts, and Colley Weston stone slates for the roofs, with oak finishings inside. Execution has been deferred for the time being.

The coloured drawing from which the illustration is reproduced was hung in the last Royal Academy Exhibition, and was prepared by Mr. C. E. Bateman, of the firm of Messrs. Bateman & Bateman, of Birmingham, the authors of the design.

SOME EIGHTEENTH-CENTURY IRONWORK.

THIS sheet of drawings, by Mr. G. G. Poston, represents some typical examples of eighteenth century ironwork. Two of them are from St. Paul's Cathedral, but most of the others, as will be seen, are from less known and less central situations.

DISTRICT SURVEYOR'S DISTRICTS.

AT Tuesday's meeting of the London County Council the Building Act Committee brought up the following Report, the recommendations being agreed to :—

"We have had under consideration the question of adjusting the limits of the various district surveyors' districts under the London Building Act, 1894, in order to make those limits, as far as conveniently may be, coterminous with the boundaries of the metropolitan boroughs constituted under or in pursuance of the London Government Act, 1899. Section 139 (1) (*a*) of the London Building Act, 1894, provides that the Council 'may alter the limits of the district of any district surveyor, or unite any two or more such districts, and place any such altered district under the supervision of any district surveyor, and do all such matters and things as are necessary for carrying into effect the power hereby given.' The various district surveyors interested have been consulted, and with the exceptions and reservations, and subject to the conditions hereinafter in the several recommendations contained, no objection is raised by those district surveyors to the adjustments of limits recommended. With a view to filling the existing vacancies caused by deaths and resignations, we propose to invite applications by advertisement. We recommend :—

'(*a*) That the eastern limit of the district of Battersea, Central, be adjusted from Wix's-lane to Nine Elms so as to coincide with the boundary of the Borough of Battersea at that part.

(*b*) That the Western limit of the district of Battersea, North, be adjusted so as to coincide with the boundary of the Borough of Battersea at that part.

(*c*) That the western limit of the district of the southern division of Battersea and the detached portion of Clapham be adjusted so as to coincide with the boundary of the borough of Battersea at that part; that the southern and eastern limits between Trinity-road, Tooting, and the western end of Nightingale-lane be adjusted so as to coincide with the boundary of the Borough of Battersea at that part; and that the district be designated Battersea, South, and part of Wandsworth.

(*d*) That the western limit of the district of St. Mary Magdalen, Bermondsey, St. John, St. Olave, and St, Thomas, Southwark, be adjusted so as to coincide with the boundary of the Borough of Bermondsey, so far as such limit adjoins the district of St. Saviour, St. George-the-Martyr (part), Christchurch, Southwark, and the Northern Division of Lambeth; that Mr. V. J. Grose, who is at present District Surveyor for St. Pancras (East), be transferred and appointed to the said district of Bermondsey, &c., upon condition that he shall not accept private practice within that district, but otherwise upon the terms of his present appointment, and that such transfer and appointment shall date from January 1, 1902.

(*e*) That the northern limit of the district of Bethnal Green East and South Bow be adjusted from Cambridge-road to Skew Bridge, Old Ford-road; that the district limit from Skew Bridge eastward be altered so as to coincide with the centre line of Old Ford-road to the existing limit of the district; and that the southern limit be adjusted from Cambridge-road to Bow-road so as to coincide with the boundary of the Borough of Stepney at that part.

(*f*) That the limits of the district of Bethnal Green West, westward of Cambridge-road, be adjusted so as to coincide with the boundary of the Borough of Bethnal Green, westward of such road, subject to the supervision by Mr. H. Lovegrove, district surveyor for Islington, South, Shoreditch, &c., of the erection of new buildings upon a site on the east side of Goldsmith's-row, bounded by Kay-street and Hackney-road.

(*g*) That the parish of St. Paul, Covent Garden, be transferred from the district of Holborn and East Strand to the district of Bloomsbury, St. Martin-in-the-Fields and Soho; that the northern limit of the said district of Bloomsbury, &c., be adjusted so as to coincide with the boundary of the Borough of Holborn at that part; that at the expiration of five years from January 1, 1902, that portion of the district in the Borough of St. Pancras be surrendered by the present district surveyor and added to the district of Holborn, &c., as proposed to be adjusted; that the limit from the south-eastern corner of Lincoln's-inn-fields to Kemble-street be adjusted so as to coincide with the boundary of the Borough of Holborn at that part, and that at the expiration of five years from January 1, 1902, the area on the south-east side of Kemble-street be surrendered by the present District Surveyor and be added to the district of Holborn and East Strand; and that the limit of the district from Kemble-street be defined by the centres of Drury-lane, part of the proposed new street to be formed by the Council, and the Strand to the existing limit of the district.

(*h*) That the western limit of the district of St. Leonard, Bromley, be adjusted so as to coincide with the boundary of the Borough of Poplar at that part.

(*i*) That the detached angular portion of the district of Newington, West, and part of Lambeth, situated on the north-east side of Camberwell New-road, westward of Camberwell Green, be transferred to the district of St. Giles, Camberwell; that the eastern limit of the district of St. Giles, Camberwell, from New Cross-road to the county boundary, be adjusted so as to coincide with the boundary of the Borough of Camberwell with the exception of an area eastward of Ivydale-road, forming part of the Haberdashers' Company's estate; that the north-western limit from Camberwell-road to Camberwell New-road be adjusted, so as to coincide with the boundary of the Borough of Camberwell at that part; and that the limit from that point be defined by the centre of Camberwell New-road to Camberwell Green, and thence by the old boundary of the parish of Camberwell to Dulwich-road, and thence by the centres of Norwood-road, Croxted-road, and Thurlow Park-road and the old boundary of the parish to the county boundary.

(*j*) That the limits of the district of Charlton, Lee, and Kidbrooke, be adjusted so as to coincide with the boundaries of those parishes as amended under the provisions of the London Government Act, 1899.

(*k*) That the western, northern, and eastern limits of the district of Chelsea, North, be adjusted so as to coincide with the boundary of the Borough of Chelsea at those parts.

(*l*) That the western and eastern limits of the districts of Chelsea, South, be adjusted so as to coincide with the boundary of the Borough of Chelsea at those parts.

(*m*) That the northern limit of the district of Clapham be adjusted so as to coincide with the boundary of the Borough of Wandsworth at that part.

(*n*) That the western limit of the district of St. James and St. John, Clerkenwell, and part of Islington, northward of St. Sepulchre Without, be adjusted so as to coincide with the boundary of the Borough of Finsbury at that part, and that the eastern limit of the said district be defined by the centre line of Goswell-road.

(*o*) That the vacant district of north-east Deptford be united with the district of south-east Deptford; that the district thus constituted be designated Deptford, East; that the northern and southern limits, and also the eastern limit southward of the parish yard at Deptford-creek, be adjusted so as to coincide with the boundary of the Borough of Deptford at such parts; that Mr. W. H. Lees, district surveyor for south-east Deptford, be appointed district surveyor for the district of Holborn and East Strand, upon condition that Mr. Lees do resign his present appointment as District Surveyor for South-East Deptford; that he do devote the whole of his time to the duties of his office, and do not during his continuance in office (except in the discharge of the duties thereof) carry on business as an architect, surveyor, or builder, or directly or indirectly as partner or otherwise, be interested in such business, and also upon the other conditions attaching to the appointment of District Surveyors; and that Mr. Lees' resignation and appointment as District Surveyor for the district of Holborn and East Strand, &c., do take effect as from January 1, 1902, and that, in the meantime, he be appointed interim Surveyor for that district; and that advertisements be issued inviting applications for the appointment of District Surveyor for Deptford, East.

(*p*) That the northern and eastern limits of the district of Fulham, North, be adjusted so as to coincide with the boundary of the Borough of Fulham at those parts.

(*q*) That the eastern limit of the district of Fulham, South, be adjusted so as to coincide with the boundary of the Borough of Fulham at that part.

(*r*) That the western and southern limits of the district of Greenwich be adjusted from the parish yard at Deptford-creek to Pond-road, so as to coincide with the boundary of the Borough of Greenwich at that part.

(*t*) That the southern limit of the district of East Hackney, South and North Bow, be adjusted from Cambridge-road to Skew Bridge, Old Ford-road, so as to coincide with the boundary of the Borough of Bethnal Green at that part, and that the district limit from Skew Bridge eastward be altered so as to coincide with the centre line of Old Ford-road to the existing limit of the district.

(*u*) That the western and southern limits of the district of Hackney, West, be adjusted so as to coincide with the boundary of the Borough of Hackney at those parts.

(*v*) That the eastern and southern limits of the district of Hammersmith be adjusted so as to coincide with the boundary of the Borough of Hammersmith.

(*w*) That the parish of St. Paul, Covent Garden, be transferred from the district of Holborn and East Strand to the district of Bloomsbury, St. Martin-in-the-Fields, and Soho; that subject to the surrender, at the expiration of five years from January 1, 1902, by the present district surveyor for Bloomsbury, &c., of the area in the north-east corner of his district which is in the Borough of St. Pancras, that portion of the Borough of St. Pancras southward of Euston-road, and eastward of Upper Woburn-place and Tavistock-square, be added to the district of Holborn and East Strand; that the limit from the south-eastern corner of Lincoln's-inn-fields to Kemble-street be adjusted so as to coincide with the boundary of the Borough of Holborn at that part, and that at the expiration of five years from January 1, 1902, the area on the south-east side of Kemble-street be surrendered by the present district surveyor and be added to the district of Holborn and East Strand; that the limit from Kemble-street be defined by the centres of Drury-lane, part of the proposed new street to be formed by the Council, and the Strand to the existing limit of the district; that St. Sepulchre Without and the Charterhouse do remain part of the district of Holborn, &c., and that the eastern limit, northward of St. Sepulchre Without and the Charterhouse be adjusted so as to coincide with the boundary of the Borough of Holborn at that part; and that the district thus constituted be designated Holborn, East Strand, and part of St. Pancras.

(*x*) That the vacant district of Hampstead, West, be united with the district of East Hampstead, &c., that those portions of the latter district known as North St. Pancras and North-west Islington be surrendered by Mr. F. Hammond (the present district surveyor) and added to the district of East Islington; that the southern and eastern limits of Mr. Hammond's district thus constituted the adjusted so as to coincide with the boundary of the Borough of Hampstead, and be designated by the name of that borough; and that such alterations do take effect from January 1, 1902.

(*y*) That the district of Islington, East, be enlarged by the addition thereto of North-west Islington and North St. Pancras, and also by the addition of so much of the district of St. Pancras, East, as is situated eastward of Camden-street and Oakley-square (north side) and northward of Euston-road; that the district thus constituted be designated Islington, North, and St. Pancras, East, and that such enlargement do take effect from January 1, 1902.

(*z*) That the limits of the district of Islington, South, Shoreditch, and Norton Folgate be adjusted so as to coincide with the boundaries of the Boroughs of Islington and Shoreditch, subject to the retention of Norton Folgate by the present District Surveyor, Mr. H. Lovegrove, and to the supervision by him of the erection of buildings on a site on the east side of Goldsmith's-row, bounded by Kay-street and Hackney-road, and also on a site on the west side of City-road, southward of Baldwin-street.

(*aa*) That the limits of the district of South-west Islington, St. Luke, Old-street, and the Liberty of Glasshouse Yard, be adjusted so far as they relate to the latter portion of the district, to coincide with

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the boundary of the Borough of Finsbury eastward of the centre line of Goswell-road and St. Sepulchre Without and the Charterhouse, subject to the supervision by Mr. H. Lovegrove, District Surveyor for Islington, South, &c., of the erection of buildings on a site on the west side of City-road, southward of Baldwin-street.

(*bb*) That the limits of the district of Kensington, North-west, be adjusted so as to coincide on the west with the boundary of the Borough of Kensington, and on the east, from Kensal-road to Kensington Gardens, with the boundary of the borough at that part.

(*cc*) That the south-eastern limit of the district of Kensington, South, be adjusted so as to coincide with the boundary of the Borough of Chelsea at that part.

(*dd*) That the districts of (1) Central Lambeth and part of Battersea; and (2) North Battersea, be united and designated "Central Lambeth and North Battersea," and that advertisements be issued inviting applications for the appointment of district surveyor for such district.

(*ee*) That no change be made at present in the limits of the district of Lambeth, South, and part of Camberwell.

(*ff*) That the western and northern limits of the district of Lewisham be adjusted so as to coincide with the boundary of the Borough of Lewisham at those parts.

(*gg*) That the eastern limit of the district of St. Anne, Limehouse, St. John, Wapping, the Precinct of St. Katharine and the Hamlet of Ratcliffe, be adjusted so as to coincide with the boundary of the Borough of Stepney at that part.

(*hh*) That no change be at present made in the limits of the district of Lower Norwood.

(*ii*) That the limit of the district of Mile End Old Town, northward of Whitechapel-road on the west, and of St. Paul's-road on the east, be adjusted so as to coincide with the boundary of the Borough of Stepney at that part.

(*jj*) That the southern limit of the district of Newington East, and part of St. George-the-Martyr, Southwark, be adjusted so as to coincide with the boundary of the Borough of Southwark at that part.

(*kk*) That the south-eastern limit of the district of Newington, West, and part of Lambeth from Camberwell-road to Camberwell New-road be adjusted so as to coincide with the boundaries of the Boroughs of Southwark and Lambeth at those parts, and that the detached angular portion of the district, situated on the north-east side of Camberwell New-road, westward of Camberwell-green, be transferred to the district of St. Giles, Camberwell.

(*ll*) That having regard to the fact that the London Building Acts, 1894 and 1898, and the by-laws, &c., made thereunder are, under the provisions of the London Government Act, 1899, and the London (Penge) Order in Council, 1900, to continue and be in force in the district of Penge until such date as the Local Government Board by order may direct, no action be taken with regard to this district.

(*mm*) That the western limit of the district of Plumstead and Eltham, southward of Shooter's Hill-road, be adjusted so as to coincide with the boundary of the Borough of Woolwich at that part.

(*nn*) That the western limit of the district of All Saints, Poplar, be adjusted so as to coincide with the boundary of the Borough of Poplar at that part.

(*oo*) That no action be taken with regard to the district of Putney and Roehampton, as beyond the severance of the area recently known as Putney, detached, this district is unaffected by the provisions of the London Government Act, 1899.

(*pp*) That the limits of the district of Rotherhithe, Hatcham, and St. George-in-the-East, be adjusted so far as relates to the portions of such limits between Deptford Reach and Trundley's-road; between Nunhead Station and New Cross-road; and between Camberwell-road and Rotherhithe New-road, so as to coincide with the boundaries of the Boroughs of Deptford and Camberwell, at those parts.

(*qq*) That no change be at present made in the limits of the district of St. George, Hanover-square, North, but that upon the completion of the rebuilding of property, on the late detached portion of St. George, Hanover-square, on the north side of Bayswater-road, which has been included in the Borough of Paddington, that area be transferred to the district of Paddington, unless circumstances should arise which may render the earlier transfer of that area desirable.

(*rr*) That the western limit of the district of St. George, Hanover-square (Belgrave and Pimlico (Division), be adjusted so as to coincide with the boundary of the City of Westminster at that part.

(*ss*) That the limits of the district of St. Marylebone be adjusted so as to coincide with the boundary of the Borough of St. Marylebone.

(*tt*) That the portion of the district of St. Pancras, East, westward of Camden-street and Oakley-square (north side), be transferred to St. Pancras, West; that the portion of the district southward of Euston-road be transferred to the district of Holborn and East Strand, subject to the adjustment of the limits adjoining the Borough of Finsbury, so as to coincide with the boundary of that borough, and also subject to the addition to the district of Bloomsbury, St. Martin-in-the-Fields, and Soho of the area southward of Tavistock-place; that the remainder of the district be united with the district of Islington, East, as proposed to be enlarged: and that the district thus constituted be designated Islington, North and St. Pancras, East.

(*uu*) That the western and southern limits of the district of St. Pancras, West, be adjusted so as to coincide with the boundary of the Borough of St. Pancras at those parts; and that the eastern limit be extended by the addition to the district of the area westward of Camden-street and Oakley-square (north side) referred to in the foregoing recommendation.

(*vv*) That the eastern limit of the district of St. Saviour, St. George-the-Martyr (part), and Christchurch, Southwark, and the northern division of Lambeth, be adjusted so as to coincide with the boundary of the Borough of Southwark at that part.

(*ww*) That the areas recently known as South Hornsey, which have been added to the County of London under the provisions of the London Government Act, 1899, be added to the district of Stoke Newington, and that the limits of such district be adjusted so as to coincide with the boundary of the Borough of Stoke Newington.

(*xx*) That the eastern limit of the district of Streatham, East, and Brixton, be adjusted so as to coincide with a line drawn along the centres of Norwood-road, Croxted-road, and Thurlow Park-road, to the existing southern limit of the district.

(*yy*) That the limit of the district of Streatham, West, be adjusted from Trinity-road, Tooting, to the western end of Nightingale-lane, so as to coincide with the boundary of the Borough of Wandsworth at that part.

(*zz*) That the western limit of the district of Sydenham be adjusted so as to coincide with the centre line of Eliot-bank, and thence southward with the boundary of the Borough of Lewisham to the county boundary.

(*aaa*) That the area recently known as Mitcham (detached), which has been included in the County of London under the provisions of the London Government Act, 1899, be added to the district of Wandsworth, East, and Tooting Graveney; that the eastern limit of Wandsworth, East, be adjusted so as to coincide with the boundary of the Borough of Wandsworth at that part.

(*bbb*) That the eastern limit of the district of Wandsworth, West, so far as it adjoins the Borough of Battersea, be adjusted so as to coincide with the boundary line between the Boroughs of Wandsworth and Battersea at that part.

(*ccc*) That the northern limit of the district of St. Mary, Whitechapel, Christchurch, Spitalfields, the Hamlet of Mile End New Town, and the Tower Liberty, be adjusted so as to coincide with the boundary of the Borough of Stepney at that part.

(*ddd*) That, where alterations in the limits of districts are approved by the Council, the solicitor be instructed to take such steps as may be necessary to secure the carrying out of such alterations, which shall be subject to the conditions that any works in progress and any proceedings in progress relating to any dangerous or neglected structure, or any other building or structure in areas surrendered by a district surveyor shall, notwithstanding the transference of those areas from his supervision, continue to be supervised by him until the completion of such works and proceedings, and that no district surveyor shall claim compensation for any diminution of income which may hereafter arise by reason of such adjustments of limits.

(*eee*) That unless otherwise specified, and subject to the exceptions, reservations, and conditions mentioned in any of the above recommendations, the transfer of district surveyors to other districts and the alterations of district limits do take effect on and after January 1, 1902, and be made in strict accordance with the conditions of the present appointments of the district surveyors concerned, and that the solicitor be instructed to take such steps as may be necessary with reference thereto.'"

COMPETITION FOR NEW MUNICIPAL BUILDINGS FOR THE URBAN DISTRICT COUNCIL OF WALTON-ON-THAMES.

THIS competition is one of those in which the winner is an easy first, with the remaining competitors far behind. Unfortunately, there is likely to be some heartburning over the result, as the authors of the first premiated design, Messrs. Macintosh & Newman, have transgressed one of the stipulations of the conditions, which enjoined that all drawings were to be executed in "black and white, or sepia and white." This injunction the successful competitors have apparently supposed to refer only to elevations, as they have coloured their plans, sections, and perspective. Although this technical breach of the conditions has occurred, the Urban District Council may be forgiven for considering that, after spending the ratepayers' money in promoting a competition in order to obtain the best available design, they would not be doing justice to their constituents by putting out of court for a trivial error a design which is far superior to any other submitted, whilst the unsuccessful competitors should accept their defeat with a good grace and the conviction that no amount of colouring in their own drawings, or the absence of it from those that have won the first premium, would bring their designs within measurable distance in point of merit of their successful rivals.

The site is at the corner of Hersham-road, to which it has a frontage of 104 ft., and Bowes-road, with a frontage of 177 ft. It is a regular trapezium, the width at the rear of Hersham-road being somewhat less than the frontage, and is amply sufficient for the buildings intended to be placed upon it. Indeed, the very amplitude of the site has led many of the competitors to ruin their chances by neglecting compactness of plan. The Hersham-road aspect of the site is a little south of west and the Bowes-road frontage a little east of south.

The buildings required on the site are municipal offices for the Clerk, Surveyor, Collector, and Inspector, council chamber and committee-room, a small fire station, a residence for the Surveyor, and apartments for a caretaker. Space had also to be left for the future erection of a police-court.

The superiority of the first premiated design is manifested both in plan and elevation. The municipal offices face the Hersham-road, from which they are entered. Left of the entrance are attendant's room, with telephone, Collector's office, and Surveyor's office, and at the rear of same, separated by a corridor 6 ft. 6 in. wide, the Surveyor's drawing office and Inspector's room. On the right of the entrance is the Town Clerk's office, fronting Hersham-road, with his clerks' office at the rear and strong-room between. On the first floor the council chamber for twenty-one members is at the north end of the building, committee-room next, and two waiting-rooms. The plan of the municipal offices is compact and convenient, but the lighting of the Surveyor's drawing office might be improved by a slight alteration in the distribution of the windows, and surely with accommodation for fifty of the public in the council chamber besides the members, officials, and Press representatives, a separate stair would be a distinct advantage.

The fire station, with accommodation for engine and hose-cart, is placed next the municipal offices facing Bowes-road, and the clubroom for fire brigade, look-out, and stair thereto, form part of the main block, and enable the authors to provide the caretaker's apartments on the first floor, whilst the look-out tower gives the opportunity for an effective feature in the composition of the exterior.

The Surveyor's residence is at the east end of the Bowes-road frontage, leaving space for the police-court between it and the fire station, and the authors have proved the sufficiency of the space provided by drawing an admirable plan for the future building.

The elevations are well designed for erection in red brick and stone in a style based upon eighteenth-century English work, but sufficiently freely treated to stamp modernity upon the grouping and detail.

Save for the one transgression to which we have already referred, the drawings are carefully prepared and fully worked out in a businesslike fashion, united with an artistic ability in design that promises well for a satisfactory execution of the work if entrusted to the authors.

The second premiated design, by Mr. George Sedger, comprises in one main block facing Hersham-road the municipal offices and the Surveyor's residence, whilst the fire station is a distinct and isolated building at the east end of the site. The planning of Mr. Sedger's municipal offices is less compact than in the first premiated plan, and, though workable, is therefore more costly for the accommodation provided than is necessary.

In the fire station the clubroom is placed over the engine house and, being approached by a narrow circular stair, would necessitate sliding poles for anything like reasonable promptness in turning out. A hose tower is provided, a good feature if funds will allow, and a site for stables is suggested. The external treatment of the design is of too domestic a character and somewhat straggling in composition.

The third premiated design, by Mr. Sidney Tatchell, like the second, fails in reaching the compactness of the first design, and has besides some further weak points; thus the

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Clerk's private office is separated from his public or inquiry office by a corridor, and is placed at the rear of the building with a north-easterly aspect, whilst the waiting-room is in an inconvenient position and has its doors arranged to jam each other in opening. Like the second design, Mr. Tatchell's scheme has the Surveyor's residence at the north end of the Hersham-road frontage, thus making it part of the main block. The design is not illustrated by a perspective, and from the elevations is ultra-severe in treatment, with a probable intention of economy that would be more effectively attained by compact planning.

Some of the remaining designs have good points, but united to serious faults that justify their exclusion from the premiums, great as is the difference between the first and the two others.

"Red Circle" has an admirable plan for the municipal offices and council chamber, and a quiet, suitable, and scholarly elevation of eighteenth-century English character, but the fire station is very poorly planned and the Surveyor's residence too costly. If these adjuncts of the scheme had equalled the author's main building a higher position would certainly have been merited.

The author of "Apps Court" has made a strenuous effort to win, but is placed out of court by the rambling, extravagant nature of his plan.

"Vinces" has a suitable type of elevation and a plan better than many, but not equal to any of those premiated.

"Isis" is the motto of a painstaking author, whose misdirected energy has unfortunately resulted in a plan that is too complicated, involved, and wasteful, whilst the arrangement of the Surveyor's residence lacks a proper comprehension of domestic planning.

"Pan" sends clever elevations of *art nouveau* tendency, but the arrangement, or rather haphazard placing of plans of various floors of three different buildings on one sheet of paper, may be *chic*, but is not business, and business must be allied with art if competitions are to be won nowadays. An almost unintelligible jumble does not make for success. The plan of the municipal offices is in itself far too rambling and faulty to make a workable building.

"Lime" is another instance of a rambling plan and pretentious design that is neither suitable nor financially possible, in spite of a considerable manifestation of ability that errs on the side of over-exuberance.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Shop Blinds, Signs, &c., over Footways.—Several petitions were presented against the proposed by-laws as to the height of shop-blinds, signs, and other structures overhanging the footways. The petitions were referred to the Building Act Committee.

The Council's Bricklayers.—On the report of the Finance Committee,

Captain Swinton asked the Chairman of the Committee whether he could give the Council any information as to the credibility of a statement concerning the laying of bricks which appeared in the *Times* of Monday, and which was to the effect that the London County Council limit was 330 bricks per day, or seventy per day fewer than the present recognised number for private London contractors.

Lord Welby: Some little time ago, when there was great activity in the building trade and a difficulty in obtaining that class of labour, it was thought that our bricklayers did not lay the number of bricks per day that would be considered fair, but lately the manager reported that the number had been increased. I cannot go beyond that at present. The attention of the Works Sub-Committee has been directed to the statements in the *Times*, and we are investigating them in order to consider how far they merit confirmation. Afterwards I hope to give my hon. friend a more specific answer.

Colonel Rotton: Do I understand that because there were fewer bricklayers available, those bricklayers laid fewer bricks?

Lord Welby: I am not responsible for the gloss which Colonel Rotton put upon my answer. I pointed out that when there was great competition for their services the bricklayers whom we employed were rather slack in the way they performed their duties.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Greenwich Borough Council 3,930*l.* for paving works; Hammersmith Council 6,850*l.* for street improvements; Woolwich Borough Council 5,375*l.* for dust destructor, and 2,000*l.* for site of baths and wash-houses.

Improvements and Rehousing.—The Improvements Committee recommended the Council to approve of an arrangement for handing over to the Housing of the Working Classes Committee a rehousing site at Leroy-street, Old Kent-road, at a nominal price, in order to avoid a deficiency on the housing account. It appeared that there was a statutory obligation upon the Council to rehouse 291 persons who would be displaced by the Long-lane and Tabard-street (Southwark) improvement, and for that purpose the site in question had been acquired, and would accommodate 380 persons. The value of the land was 2,875*l.*, but the Housing Committee could only afford to allow 1,432*l.* for it, and the proposal was to make the balance of 1,443*l.* a charge upon the improvement account.

Mr. Beachcroft said this was a novel proposal, and it raised a very important question of principle. He doubted whether it was not setting aside the standing orders, and he moved to refer the report back.

Dr. Longstaff seconded the amendment.

Mr. H. Clarke observed that the trades unions had made it impossible to build houses at a profit.

Sir H. Bliss wondered by how much the cost of housing had been enhanced owing to the neglect of the British workman to give the Council a fair day's work for a fair day's wage.

After considerable debate the amendment was defeated, and the recommendation was adopted.

The Improvements Committee further recommend a similar arrangement in regard to a site at London-fields, Hackney, upon which it was proposed to rehouse 486 persons displaced by the Mare-street improvement. The value of this site was estimated at 1,250*l.*, but the Housing Committee, in complying with the requirements of the Home Office as to the buildings, were unable to allow anything for the land. It was proposed, therefore, to fix the value of the land for rehousing purposes at nil.

Some further discussion arose on this recommendation, which was then agreed to.

Vaults under Footways.—The Improvements Committee reported that, in connexion with the Holborn to the Strand improvement, they had had before them the question whether vaults should be constructed under the footway in the new street, in the Crescent-road, and on the north side of the Strand between Wellington-street and the Law Courts. The Metropolitan Board of Works constructed vaults under the footways when carrying out some street improvements, but the results were not financially satisfactory. There were, however, several reasons why vaults under the new footway on the north side of the Strand were highly desirable. They would provide a foundation upon which the footway could be laid, and the fact of having the subway for pipes close to the footway also made it more convenient to have the vaults constructed in the first instance, as the tops of the vaults could be used to support the crane, which would otherwise occupy a large portion of the carriage way of the Strand. The report added that the local authority would raise no objection to the construction of vaults projecting under the roadway to the extent of 12 ft. Excluding the frontage of certain establishments, the estimated cost was 3,500*l.*, for which the Council was recommended to pass a supplemental estimate, and the committee had reason to believe that the whole cost would be recovered from the lessees of sites on the north side of the Strand. The committee would advise in due course whether similar works should be undertaken in the new street and Crescent-road.

The report was adopted.

The New Street.—Mr. Davies, Chairman of the Improvements Committee, said that they had not yet decided what name for the new street to recommend, but the Council would have an opportunity of considering the matter.

The Widening of Piccadilly.—Mr. Davies announced that his committee had conferred with the First Commissioner of Works as to the Piccadilly widening scheme, and had come to an understanding with the right hon. gentleman. The committee would meet that day, and would bring up to the Council on Tuesday next a definite proposal, with the view of securing the authority of the Council to commence the work at once.

Erection of One-story Shops in Victoria-street, Westminster.—The Building Act Committee brought up the following paragraph:—

"The Council on October 8, 1901, for the second time referred back for further consideration our recommendation on the application of Messrs. Z. King & Son on behalf of Mrs. M. Hiscox, Mr. J. T. Hiscox, and Mr. R. T. Raikes for the erection of one-story shops and an entrance porch in front of No. 125, Victoria-street, Westminster. We have again given the matter our careful consideration, with the result that the applicants have now submitted further amended plans, which include the houses Nos. 123, 125, and 127, and also Nos. 145 to 169 (odd numbers). By this proposal the shops are intended to be erected so that no portion other than the plinths to the pilasters will project in advance of the line of the projecting bay-windows, whilst the pilasters to the porches will project 4½ in. in advance of this line. The effect will be that a strip of land 5 ft. 6 in. in width will be given up to the public way, except in front of the porches, where it will be 5 ft. 1½ in. in width, and the shops will project 3 ft. from the present line of buildings. The recommendation, which was referred back, only provided for the giving up of a strip of land 4 ft. 9 in. in width in front of the shops and 4 ft. 3 in. in front of the porch, whilst the shops were to project a distance of 3 ft. 9 in. in front of the existing buildings. It will thus be seen that the present proposal is a more advantageous one, from the Council's point of view, than the proposal previously submitted, having regard to the increased width of the land to be given up to the public; and we think that the Council should favourably consider it. We recommend—1. That the Council, in the exercise of its powers under Sections 22 and 73 of the London Building Act, 1894, but in no way otherwise than under such sections, do consent to the erection of one-story shops and entrance porches in front of Nos. 123, 125, and 127, and Nos. 143 to 169 (odd numbers only, inclusive), Victoria-street, Westminster, to the lines shown on the plan, dated November 9, 1901, submitted with the application of Messrs. Z. King & Son on behalf of Mrs. M. Hiscox, Mr. J. T. Hiscox, and Mr. R. T. Raikes."

The recommendation, after some discussion, was agreed to.

New County Hall.—Replying to a question, Colonel Rotton said a Sites Committee had been appointed, but he was afraid he could hold out no hope of there being a settlement of the matter of a proper home for the Council for a long time.

The Rev. F. Williams asked if it was a fact that the Council paid 18,000*l.* a year in rent or buildings outside the County Hall?

Colonel Rotton said that was so. Within the last few years their staff had doubled.

On a recommendation to take further premises for the housing of the staff,

Mr. Pigott moved that the recommendation be referred back, and pointed out that it was time the question of a proper home for the Council was settled. The present state of affairs was unjust to the staff and unjust to London.

Captain Hemphill seconded the amendment, which, after discussion, was withdrawn, and the recommendation was agreed to.

Fires in Oilshops.—The Fire Brigade Committee called attention to the recent fatal fire at an oilshop in Judd-street, Brunswick-square. Three persons occupying rooms on the third floor were suffocated. The committee suggested that the Building Act Committee should consider the desirability of so amending the London Building Act as to provide for the fire-proof separation of oilshops from living and sleeping rooms, and for ready escape from such premises.

Mr. Gilbert, chairman of the committee, observed that most of the oilshops in London were nothing but death-traps in case of fire.

The report was adopted.

Tenders.—The tenders of Messrs. Ellis, Pollen, & Co., to execute for 111*l.* 10s., 102*l.* 11s., 113*l.*, and 73*l.* 17s. the wiring, and to supply the fittings for electric light installations at the West Hampstead, East Greenwich, and Perry-vale stations, and the Homerton sub-station respectively were accepted.

Having transacted other business, the Council adjourned.

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APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Dulwich.—A one-story bakehouse at No. 10, Alleyn-terrace, Park-road, Dulwich, to abut upon South Croxted-road (Mr. F. C. Bodley for Mr. L. French).—Consent.

Hackney, North.—Two one-story shops on part of the forecourts of Nos. 91 and 91A, Upper Clapton-road, Hackney (Mr. W. H. White).—Consent.

Hammersmith.—That the application of Mr. W. G. R. Sprague for Mr. J. B. Mulholland for an extension of the period within which the erection of a theatre building on the north side of Hammersmith-road, Hammersmith, at the corner of Rowan-road, was required to be commenced, be granted.—Agreed.

Lewisham.—Wood and tile pents to the entrances to fourteen houses on the west side of Homecroft-road, Sydenham (Mr. F. B. Colvill).—Consent.

Lewisham. — Wood and tile pents over the entrances to four dwelling-houses on the south side of Stillness-road, Brockley-rise, Lewisham (Mr. H. Lillywhite).—Consent.

Strand.—The retention of an iron and glass stallboard light and a parapet wall in front of No. 46, Great Marlborough-street, St. James's (Messrs. Dunn & Watson for Mr. C. H. Smith).—Consent.

City.†—An iron and glass shelter at the entrance to the Saracen's Head Hotel, Snow-hill, City (Messrs Wilkinson & Parker for Mr. F. Dredge).—Refused.

Hampstead.—A block of residential flats on the northern side of Finchley-road, Hampstead, at the corner of West Hampstead-avenue (Mr. J. Reynolds).—Refused.

Hoxton.—An iron and glass shelter at the London Music Hall, High-street, Shoreditch (Mr. F. Matcham for the London Music Hall Co., Ltd.).—Refused.

Lewisham.—Houses in Brightside-road, Saravia-road, Elthurda-road, Nightingale-grove, and Mallett-road, Hither Green, Lewisham (Mr. G. Tolley for Mr. J. Laird).—Refused.

Lewisham.—A one-story shop on the forecourt of No. 141, Rushey Green, Catford (Mr. J. Laird for Mr. F. Hardstone).—Refused.

Marylebone, West.†—Two projecting oriel windows at the rear of 30, Montagu-square, St. Marylebone, to abut upon Bryanston-mews East (Mr. G. R. Shaw).—Refused.

Strand.—A sign in front of the Lyric Theatre, Shaftesbury-avenue, St. James's (Mr. J. G. Buckle for Mr. T. B. Davis).—Refused.

Strand.—Two iron and glass shelters at the entrances to an extension of the Trocadero Restaurant, Shaftesbury-avenue, St. James's (Messrs. J. Lyons & Co., Ltd.).—Refused.

Wandsworth.†—Buildings on the north-west side of Balham High-road, Balham, on the site of Russell House (Messrs. Bourchier, Burmester, & Galsworthy for Mr. J. W. Holdron).—Refused.

Width of Way.

Southwark, West.—Three warehouse buildings at Greenmore Wharf, Nos. 41, 43, and 44, Bankside, Southwark, with the external walls of such buildings at less than the prescribed distance from the centre of the street (Mr. W. A. Lewis for Messrs. Cranbourne & Cranbourne).—Consent.

Hammersmith.—The retention of boundary wall at less than the prescribed distance from the centre of Albert-road, Hammersmith (Mr. M. W. Hervey for the West Middlesex Waterworks Co.).—Consent.

Rotherhithe.—A store building on the east side of Dock-passage, Surrey Commercial Docks, Rotherhithe, with the external walls at less than the prescribed distance from the centre of the street (Mr. J. S. Gaskell for the Surrey Commercial Dock Company).—Refused.

Width of Way, Lines of Frontage, and Projection.

Marylebone, West.—One-story addition in front of the coach-house at No. 9, Gloucester-mews West, St. Marylebone, with the external walls of such addition at less than the prescribed distance from the centre of the street (Messrs. W. Phillips & Son for Mr. E. E. Greenwell).—Consent.

Hampstead.—A motor-car house in the grounds of "Moreton," Holly-place, Hampstead (Mr. W. Woodward for Mr. T. E. Sidney).—Consent.

City.—An oriel window at the first, second, and third floor levels in front of Nos. 59 and 60, Old Bailey, City (Mr. R. Plumbe for the Trustees of the United Kingdom Band of Hope Union).—Consent.

Limehouse.—A projecting turret to the Alexandra wing of the headquarters of the British and Foreign Sailors' Society, on the west side of Beccles-street, Commercial-road East, Limehouse (Messrs. Niven & Wigglesworth).—Refused.

Clapham.—One-story shops on the forecourts of Nos. 114, 116, 118, and 120, Clapham Park-road, Clapham, at the corner of Abbeville-road (Mr. H. G. Brace for Mrs. E. M. Jewell).—Refused.

Marylebone, East.—A church, with projecting porch and buttresses, on the west side of Glentworth-street, at the corner of Upper Park-place, St. Marylebone (Messrs. W. Bucknall & J. N. Comper for the Rev. G. F. Forbes).—Refused.

St. Pancras, East.—Iron and glass shelters at the entrances in Crowndale-road and Bayham-place, to the Camden Theatre, High-street, Camden Town (Mr. W. G. R. Sprague for the Camden Theatre, Limited).—Refused.

Space at Rear.

Chelsea.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a block of residential flats on plots Nos. 1 to 4 Cheyne-walk, Chelsea, at the corner of Beaufort-street, with an irregular open space at the rear (Mr. J. Ross for the Town and Gown Association, Limited).—Consent.

Width of Way, Lines of Frontage and Construction.

City.—An iron and concrete gangway across Bull's Head-passage, City, to connect Nos. 93 and 97, Wood-street (Mr. A. Conder for Messrs. Dent, Allcroft & Co.)—Consent.

Hackney, Central.—The retention of an iron shed at the rear of No. 358, Kingsland-road, Hackney, to abut upon Haggerston-road (Messrs. D. Gilson & Co.).—Refused.

Width of Way and Space at Rear.

Woolwich.—That the Council do make no order with respect to the application of Mr. H. Roe on behalf of Mr. W. Sutch, for consent to the erection of three houses on the west side of Barnfield-road, Plumstead.—Agreed.

Formation of Streets.

Lewisham.†—That an order be issued to Mr. W. B. Hill sanctioning the formation or laying out of two new streets for carriage traffic on the Grange estate, Sydenham-road, Lewisham. That the names Sunnydene-street and Highclere-street be approved for the new streets.—Agreed.

Bethnal Green, South-West.—That the application of Messrs. Davis Brothers for an extension of the period within which the roadway of a new street for carriage traffic to lead from Bethnal Green-road to Old Bethnal Green-road, Bethnal Green, was required to be clearly defined throughout by posts and rails or so otherwise as the Council should permit, and be thrown open to the public as a highway, be granted.—Agreed.

Means of Escape from Top of High Buildings.

Newington, West.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the top floor of an extension on the southern side of Rowton House, Newington Butts, Newington (the upper surface of which floor will be above 60 ft. from the street level), for the persons dwelling or employed therein (Mr. H. B. Measures for Rowton Houses, Limited).—Consent.

St. George, Hanover-square.—Means of escape in case of fire proposed to be provided in pursuance of Section 63 of the Act, on the top story of the southern portion of a block of residential flats on the west side of Harewood-place, St. George, Hanover-square (the upper surface of the floor of which story is above 60 ft. from the street level), for the persons dwelling or employed therein (Mr. P. Hoffman for Mr. H. Lovatt).—Consent.

Buildings for the Supply of Electricity.

Hammersmith.—An open shed at the electric lighting station, Fulham Palace-road, Hammersmith (Mr. H. Mair for the Council of the Metropolitan Borough of Hammersmith).—Consent.

Norwood.—The retention of a wooden cooling tower at the company's works, Bengeworth-road, Loughborough Junction (Messrs. Kincaid, Waller, & Manville for the South London Electric Supply Corporation).—Refused.

Lambeth, North.—Two iron and glass structures to carry circular fans to be used for ventilating the engine-room at the generating station, 85, Commercial-road, Lambeth (Mr. W. B. Pinhey for the Charing Cross and Strand Electric Supply Corporation, Limited).—Refused.

Cubicle Extent.

Southwark, West.—The erection on the east side of Dantzic-street, Borough-road, Southwark, of a building to exceed in extent 250,000, but not 450,000 cubic feet, and to be used only for the purposes of the manufacture of printing machines (Messrs. R. Hoe & Co. for Mr. R. Hoe).—Consent.

Cubicle Extent and Construction of Building.

Poplar.—The retention at Glengall-road, West Ferry-road, Poplar, of a shed which, together with the building to which it is attached, exceeds in extent 250,000 but not 450,000 cubic feet, and to be used only for the purposes of the manufacture of rope (Mr. R. C. Murray for Messrs. J. & E. Wright, Ltd.).—Refused.

The recommendations marked † are contrary to the views of the Local Authorities.

THE STUDENT'S COLUMN.—Our Student's Column article ("Gas and Gas Fittings") is held over until next week.

Correspondence.

To the Editor of THE BUILDER.

ECCLESIASTICAL DILAPIDATIONS.

SIR,—With regard to your "Note" *re* "Ecclesiastical Dilapidations" in your issue of November 2, that there should be compulsory periodical surveys of clerical buildings—this matter was discussed in evidence before a Committee of the House of Commons "to inquire into the administration of the Dilapidations Act," in 1876; and it was found that the estimated cost to the clergy in fees alone for surveyor, diocesan officials, &c., would be 30,000*l.* a year, if every benefice having buildings belonging to it were surveyed every five years. I suppose it was this report that prevented five-yearly compulsory surveys from being adopted; and in view of the fact that a large number of clergy keep their buildings in fair order without periodic surveys. It is certain, however, that there will soon be a change in the Dilapidation Act as at present administered, and the best method would seem to be for the Bishop to require each of his Rural Deans to report on the state of buildings in his Rural Deanery, so that in the case of buildings showing obvious neglect he could order a compulsory survey. This would be an encouragement to incumbents to keep their buildings in fair repair as by so doing they would avoid surveyors' fees. Mr. De Bock Porter's scheme of centreing all administration of dilapidations in a large London office would be too drastic and open to obvious objections. The only serious hardship to be overcome is, that an incumbent at present is able to neglect his buildings, so that if he dies with no assets a large sum is chargeable to whoever succeeds to the living, as mentioned in your paragraph.

GERALD COGSWELL, A.R.I.B.A.

A RIVERSIDE MEMORIAL CHAPEL.

SIR,—The reference in your last issue to the strange disuse of the Thames for displays and processions prompts me to ask—what others may have already asked, but if so, it has escaped my notice—if it has been suggested that the Millbank clearance between the Houses of Parliament and Lambeth Bridge would provide a fine site for the erection of a riverside memorial chapel? This would surely be a more suitable spot than the often proposed addition to the Abbey—often proposed, but as often condemned.

With amply planned water-stairs and terraces, there should be opportunities here for impressive spectacles, and the approach by water of a stately funeral procession would fitly typify our British love for the sea.

W. GANDY.

FINISHING A DWELLING HOUSE.

SIR,—May we be allowed to say with what very considerable pleasure we have read the above interesting paper by Mr. Davis in your issue of the 16th. One point at least, however, seems to have been overlooked by its writer, which we think will appeal to all practical minds, viz., the lack of consideration given (generally speaking) by architects to the needed space that should be provided for the free and proper placing and use of inside and outside blinds.

Many times it is found, after the completion of a most charming building, that the casements made to open inwards, with the transom fanlight and its perhaps necessary but most unsightly opening gear, prevent the use of any kind of rolling or venetian blind, so that the lady of the house has to in the end be satisfied with the new fangled collection of small pieces of cloth and strings called casement curtains, arising wholly from want of thought in anticipating the ordinary conditions of use of and necessity of inside blinds, especially in town houses.

The trouble, however, becomes worse in houses when the casements and fanlights open outwards, and where outside blinds for sunny aspects are needed, for in such cases (especially when the window heads are made to run up close below an eaves gutter) it is often found *impossible* to fix a sun blind till the sashes have been rehung, or at least rearranged.

Please let this be a further plea for the lifting sash, not only on account of the nice adjustment of ventilation that is ensured by its use (and so feelingly put by the writer of the paper), but that either inside or outside blinds, and the customary curtains, may at all times be adapted and used.

We venture to address you at this length solely because we feel that blinds, though a small item as regards cost in "finishing a dwelling-house," form no small detail in assuring that comfort, quiet, and privacy that every owner of a house should receive the benefit of in return for his outlay.

OLD READERS.

MANCHESTER FIRE STATION COMPETITION.

SIR,—After waiting over two months for the result of this competition to be announced, we

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wrote to the Town Clerk of Manchester on the 6th inst. as follows :—

"Dear Sir,—Will you kindly let us know when we may expect to hear the result of the Assessor's award in the Fire Station Competition, and also the name of the Assessor."

In your issue for the 9th inst. we noticed the result of the Watch Committee's decision, and again wrote the Town Clerk on the 9th inst.:—

"*Fire Station.*

Dear Sir,—In a further reference to our letter to you of the 6th inst., which remains unacknowledged by you, we notice a few meagre details of the result of the above competition in this week's issue of the *Builder*.

We shall be glad to know whether the designs will be on view to the public or the competitors, and whether the competitors can obtain or see a copy of your professional advisor's report and be informed of the name of that gentleman."

This letter also remains unacknowledged up till now, and we are sending you this correspondence to show the cavalier manner in which the Manchester authorities are treating architects in this competition.

The letters could surely have received a formal acknowledgment, and competitors ought to be informed of the number of designs received, the assessor's name and his award, and whether the designs would be on view.

Two months also appears to be an unconscionable time to take to adjudicate on the designs received, and in the interests of architects who enter competitions, we think a protest should be made against this treatment, and a time limit be fixed in which the award would be made known, for when all information is so persistently withheld, as in the present instance, one cannot refrain from suspecting the bona-fides of the promoters.

S. B. Russell and C. E. Mallows.

November 13.

BOOKS RECEIVED.

A History of Architecture on the Comparative Method. By the late Professor Banister Fletcher and Banister F. Fletcher, A.R.I.B.A. Fourth edition; revised and enlarged. (B. T. Batsford.)

British Sculpture and Sculptors of To day. By M. H. Spielmann (Cassel & Co.)

The Pavement Artists of Siena. By R. H. Hobart Cust, M.A. (Geo. Bell & Sons)

OBITUARY.

M. Chipiez.—We greatly regret to announce the death of the eminent French architect M. Charles Chipiez, whose name, in conjunction with that of his collaborator M. Perrot, is so familiar to English architectural readers in connexion with their joint publications on ancient architecture. M. Chipiez was sixty-six years of age at the time of his death. He was a former pupil of Constant Defeux and of Viollet-de-Duc. In 1872 he obtained the first premium in competition for the design for the war monument at Buzenval. He was well known both for his numerous publications and also for some excellent work in the restoration of ancient buildings. Among his works in modern architecture may be mentioned the national primary and technical schools at Armentières. M. Chipiez had been for twenty-seven years a member of the Société Centrale des Architectes Français.

Mr. Porter.—We regret to announce the death at his residence, Moyle Tower, Hythe, Kent, on November 17, in his eighty-first year, of Mr. Frederick William Porter, J.P., F.R.I.B.A., formerly of No. 16, Russell-square, London. Mr. Porter, who was District Surveyor for the Holborn and East Strand district, including St. Clement Danes, St. Mary-le-Strand, St. George-the-Martyr, St. Paul, Covent Garden, &c., became an Associate of the Royal Institute of British Architects in 1850, was elected a Fellow in 1855, and served for some while as a member of the Council. Of his more principal architectural works we may mention those following:—The Union Bank Chambers, Carey-street, W.C., the carving being by Mr. Kelsey (1866); the Union Bank of London, Charing Cross, at the corner of Spring-gardens, erected on the site of Farrance's noted confectionery shop and illustrated in the *Builder* of April 20, 1872; St. James-the-Apostle Church, Prebend-square, Packington-street, Islington, built by the Clothworkers' Company in 1874-5, for 500 seats, at a cost of about 10,000*l.*, to replace Lambe's Chapel, Monkwell-street, pulled down in 1875; the London and Westminster South Kensington branch bank, Brompton-road (the carving and sculpture by Mr. Kelsey), illustrated in the *Builder* of November 21, 1885; No. 16, Newman-street, W. (Messrs. F. W. Porter & Hill), 1892-3; the hall and gymnasium, presented by Mr. Howard Morley in memory of his father the late Mr. Samuel Morley, for the Young Women's Christian Association, at No. 26, George-street, Hanover-square, W. (Messrs. F. W. Porter & Son), 1897; and, as we understand, the church of St. Anne, in Thorburn-square, Bermondsey, with seating accommodation for 1,000 persons, consecrated on July 20, 1870. He was architect also of the Union Bank of London branch office in Chancery-lane (1864-5), and, as we are informed, of that bank's chief offices in Princes-street, E.C.

GENERAL BUILDING NEWS.

Church, Stirchley, Birmingham.—The new Church of the Ascension at Stirchley was dedicated recently. The building is a structure erected from the designs of Mr. W. Hale, the walls of which are of red brick, with outer dressings of terra-cotta. The internal piers, arches, and dressings are in selected Farleigh Down Bath stone, and accommodation is provided for 578 adults. The nave is 82 ft. long by 35 ft. wide, with north and south ambulatory aisles, each having five low arches from the nave. The chancel is 32 ft. 6 in. by 22 ft., and on the south side are the clergy and choir vestries, the latter of which is carried up as a tower, in which are the organ chamber, ringing loft, and belfry with provision for eight bells. At the western end of the nave, and connected with it by a triple-arcaded and traceried opening, is an apsidal-shaped baptistry. The chancel has a seven-light east window, and two lights on the north side and one on the south. The roof is waggon-shaped, and divided into panels.

Church, Walsall.—On the 2nd inst. the foundation-stone was laid of a new church which is to be erected at Palfrey, Walsall. The church is to take the place of an iron structure which has done duty as a mission church in connexion with Caldmore parish, and a new parish is to be formed. The contract has been undertaken by Mr. W. Hopkin, of Birmingham, for 4,400*l.*, the architects being Messrs. J. E. K. and J. P. Cutts, of London.

Church Extension, Gainsborough.—At a meeting of the Enlargement Committee, in connexion with St. John's Church, Gainsborough, Mr. J. T. Micklethwaite, architect, of London, attended, and the alternative schemes for enlarging the church were discussed. It was eventually decided to lengthen the nave by three bays, and to construct temporary side aisles, the cost being estimated at over 2,000*l.*

Marlston Church, Berks.—This building has recently been enlarged. The church, as enlarged, now consists of a nave 45 ft. long and a chancel 22 ft. long inside, both of equal width of 18 ft. The old walls were underpinned to a depth of 5 ft. below the floor with solid brickwork in cement, and a damp-proof course was inserted to prevent dampness. For the same purpose proper drainage has been put all round the church. The principal ancient feature of the church is a doorway on the north side, which has hitherto been blocked up. This has been opened out, the stonework repaired, and an oak door now fills the opening. The old oak roof of the nave has been stripped and overhauled without at all interfering with its ancient parts; the oak timbers have been strengthened and repaired, and the whole covered with oak boarding exposed on the inside. A modern stone turret at the west end has been removed, and a square turret of oak has been added. The new chancel is an extension of the church, corresponding to the nave in width and height, the separation between the two being marked within by an arrangement of oak timber framing. The chancel roof is of oak, and in general character is similar to the old roof of the nave. The chancel stalls are of oak, with poppy heads and carved traceried panels. The chancel steps are of polished Devonshire marble, and the floors are of encaustic tiles. On the south side of the chancel, within a window recess, there is a stone sedilia with credence. Against the east wall is a carved reredos of Corsham stone with marble panels, and in the centre panel is a marble cross. Above is a three-light traceried east window, which has been filled with stained glass executed by Mr. C. E. Kempe. It represents the "Nativity of our Lord," in the bottom of the central light being the figures of the Infant Child and Virgin Mother. Upon a scroll in the south light is the inscription. The vestry is on the north side, and there is a heating chamber beneath. The nave seats are of oak, and the floors, where seats occur, are of wood blocks on a concrete foundation; the other nave floors are paved with small red geometrical tiles. A new octagonal font has taken the place of a small bowl which formerly existed. The church is heated with hot-water radiators on the low-pressure system, supplied by Messrs. Fox & Son, of Finsbury; the reredos was executed by Mr. H. Frith, of Gloucester; the wrought metal work is by Messrs. Chew & Sons, of Stroud; and the building works have been carried out by Messrs. Alfred Groves & Sons, of Milton-under-Wychwood, all from the designs and under the supervision and direction of Mr. S. Slingsby Stallwood, F.S.A., of Reading.

Church, Jesmond.—The foundation-stone of the new Church of St. Barnabas, in Goldspink-lane, Newcastle, was laid recently. The church is to be built of Byker stone. The whole of the roofs and internal wood fittings are to be of pitch pine. The walls will be plastered on the inside. The plan consists of nave and chancel, with narrow north and south aisles containing passages, clergy and choir vestries, and organ chamber and heating cellar below, with raised floor at the east end. The nave and chancel are lofty, and have apsidal ends, and include a clearstory of three-light windows. The north and south aisles are capable of future extension. The total length of the church is 137 ft. and its present width 40 ft.; but its width when the aisles are extended would be 57 ft. A tower and spire, rising to a height of 160 ft., will be the principal feature when completed, but at present only the lower portion of the tower is to be built. There will be sitting accommodation for about 450, but the extension would provide another 250, making 700 altogether. The contractors for the work are Messrs. William & George Henry Scott, of Sunderland. Messrs. Hicks & Charlewood, of Newcastle-on-Tyne, are the architects.

Parish Church, Fortingall, Perth.—The foundation-stone of the new parish church at Fortingall was laid by Lady Curry of Garth recently. The new church is being built on the site of the old church, but is thrown back 6 or 7 ft. in ground taken from the garden of the manse. The new building is practically the same size as the old one, and will have sitting accommodation for 200 worshippers. It will consist of nave and chancel. The walls will be in oak panelling to a height of 5 ft., and above this the stone will be exposed. The roof will be wholly in oak. The pulpit and seats will also be in oak. The architects are Messrs. Dunn & Watson, of London.

Tynecastle Church, Edinburgh.—A new church has been built close to the adjoining tenements of Gorgie-road, Edinburgh. The church has a frontage of 66 ft., and to secure better light for the portion of the interior darkened by the tenements, two entrances are provided, one near either extremity. The building consists of nave, 91 ft. by 29 ft., and aisles 64 ft. long, the total width being 51 ft. These divisions are indicated on the front by buttresses of varied size but the same projection, finishing at the top with pinnacles and carved finials. One larger than the rest is completed as a belfry. Vestibules and gallery staircases are provided in the entrances, and below the circular arch which carries the east staircase is a pend, open to the passage leading to the hall behind the church. The design is by Messrs. Hardy & Wight. The doorways have moulded piers, with engaged pillars and arches to correspond. The gallery at this end is lighted by a window 20 ft. by 10 ft. The interior has a ceiling boarded nearly to the ridge both in nave and aisles. The church is seated for 1,000, including choir and elders' seats. A Communion table and chairs in oak and a stone font have been gifted to the church, which will cost under 4,000*l.*—*Scotsman*.

St. Michael's Church, Edmonton.—This new church, of which, together with the vicarage, Mr. Carôe is the architect, and of which the foundation-stones were laid on October 5 last, will provide sittings for a congregation of 730. The church has been established with a sum of 12,000*l.* allotted by the Ecclesiastical Commissioners out of the proceeds of the sale of the site and materials of the Church of St. Mary Bassishaw, in the City of London, and will replace the present mission church of St. Barnabas erected twenty years ago.

Restoration of Moulton Church, Norfolk.—After being closed for five months, the church of Moulton St. Mary was re-opened recently. The work of restoration has been carried out by Messrs. Hawes, of Norwich, under the direction of Mr. Arthur S. Hewitt, of Great Yarmouth, and includes a new open roof and flooring to the nave, with new benches instead of the old high pews, repairs to walls and windows, and the cleaning of the Jacobean pulpit and the Early English font. In the course of the work some interesting discoveries have been made, chief among which are a set of early mural paintings representing the "Works of Mercy," and a colossal painting of St. Christopher. A small brass effigy and inscription has also been discovered hidden under the floor.

Schools, Aberdeen.—The Education Department have approved of the plans for the enlargement of the Central School into a high-grade public school and pupil teachers' institute, the enlargement taking the form of a new building facing Schoolhill and Belmont-street. The design is Renaissance in character. The frontage along Schoolhill will be about 100 ft., and along Belmont-street about 145 ft., and both will be similarly treated. The estimated cost of the building, exclusive of heating and furnishings, is 22,500*l.* The plans and designs of the building, and also of the heating, ventilating, and furnishings, have been prepared by Mr. J. A. O. Allan, the architect of the School Board.

Building in Bradford.—The Building Committee of the Bradford Corporation during the twelve months ending August 31 approved 445 plans out of 1,160 deposited. Included in the plans approved were 1,145 dwelling-houses, twenty-one houses and shops, twelve warehouses, four mills, sixteen workshops, two places of worship, twenty-five lock-up shops, fifty-four streets, and ninety-two back roads. Plans were also approved for five Board schools, two Poor Law relief stations, two tall chimney-shafts, and the electricity generating station. There was more activity in the building trade than in the previous year, but less than in either 1898 or 1899.

Kesteven Asylum, Rauceby, Lincolnshire.—Advantage was taken of the practical completion of the new County Asylum at Rauceby to hold the quarterly meeting of the Kesteven County Council there on the 13th inst. The asylum, which stands in an estate of 115 acres—the actual buildings cover-

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ing over seven acres—has cost 166,000*l.*, and will accommodate 500 patients. The Kesteven authority formerly had a share in the County Asylum at Bracebridge, near Lincoln, but owing to the rapid increase in the number of patients, and the great difficulty in finding accommodation, it was deemed necessary to erect a separate asylum for Kesteven. The most modern ideas regarding the treatment of the insane have dictated the arrangement of the buildings, which were planned by Mr. G. T. Hine, of London, and have been erected by Messrs. Kirk, Knight, & Co., of Sleaford. The patients' blocks are placed in the brightest and most sunny aspects, and the quarters of the staff and officers are conveniently situated. The equipment of the premises is on a liberal, if not lavish, scale, the furniture alone costing 10,000*l.* A feature of the institution is a theatre capable of seating 700 spectators. Another interesting department of the institution is formed by the laundry block, in which modern machinery will be used, the power being supplied by an electric motor. There is also a bakery on similarly up-to-date lines. A chapel stands detached from the main buildings, and it comprises nave and aisles, north and south transepts, an organ-chamber and vestry. The buildings are of Leicestershire red bricks with Ancaster stone dressings, the roofs being of Vermont green slate. The patients' block bulk largely in the façade, but between them are the quarters of the head nurse and housekeeper and the assistant medical officer. The administrative block is between these on the south and the front entrance on the north, and to the east of this are the attendants' quarters, which look into a large court. On the west are the quarters for the nurses, with another large court in front. Adjoining are the laundry, drying-ground, and mortuary. Each block has two entrances from the main corridors which are 9 ft. wide, paved with wood, and with a golden-brown dado of glazed brick. The floors and ceilings are fireproof, being laid by the Stuart Granolithic Co., and the lavatories are the work of Messrs. Doulton & Co. For water-supply purposes there is a tower upwards of 100 ft. high. The hot and cold water mains, condensers, &c., are placed in a large subway running under the main corridors. —*Yorkshire Post.*

NORWICH UNION LIFE OFFICE.—The foundation-stone of this building has just been laid. The architects of the building, which was illustrated in the *Builder* for April 13, are Messrs. G. J. & F. W. Skipper, of Norwich.

QUEEN'S EYOT, RIVER THAMES.—Plans and designs have been prepared for the authorities of Eton College by Mr. T. G. Jackson, R.A., for a club-house on Queen's Eyot or island, situated a short distance below Monkey Island, between Bray and Boveney Locks. The level of the northern portion of the island has been raised, some trees have been planted, and the foundations of the new clubhouse have been begun, the total estimated cost being 3,000*l.*, towards which 2,000*l.* is already subscribed. Consequent upon the recent sale of Surly Hall, on the Berkshire bank, near Boveney Lock, Queen's Eyot will henceforth serve as the resort and head-quarters of the Eton Boat Club.

THE UNIVERSITY LIBRARY, CAMBRIDGE.—The University Library Syndicate have approved of the plans prepared by Mr. W. C. Marshall for roofing in the east court of the library buildings, at an estimated cost of about 6,500*l.*

NURSES' HOME, SALISBURY INFIRMARY.—The Victoria Home for Nurses has just been opened. The Home is built of red brick with tiled roof, and the entrance for the nurses will be from the infirmary through a covered way. On entering the building a cloakroom will be found on the left, 19 ft. by 12 ft., fitted with lavatories, dressing-tables, and lockers. There are also a linen sorting-room and boxroom. The Home is lighted throughout with electricity and heated with hot water. On the right side of the corridor is the furnace-room with heating apparatus and hot-water supply, kitchen, and scullery for the use of the staff. The corridor leads into a hall, opening into which are sitting-rooms for the superintendent, head nurses and probationers. The superintendent's apartment is 18 ft. by 11 ft. 6 in., the nurses' 18 ft. by 18 ft., and the probationers' 28 ft. by 17 ft. On the first and second floors are forty-four bedrooms, varying in size from 18 ft. by 9 ft. 6 in. to 12 ft. by 8 ft. 6 in. The staircases are of stone, and provision is made for escape in case of fire by three iron ladders which are accessible from each floor. The upper floors are of Potter's patent fireproof construction. Telephonic and electric bell communication is established with the infirmary. The building has been erected from plans by Messrs. J. Harding & Son, the contractors being Messrs. Webb & Co., of Salisbury, while Mr. T. Dawkins, of Barford St. Martin, built the covered way.

DRILL HALL, HENDON.—A new drill-hall has just been opened at Hendon. The buildings consist of an armoury, an officers' mess, a sergeants' mess, recreation-room, a six-roomed house for the sergeant-instructor, and the drill-hall, measuring 90 ft. by 45 ft., providing drilling accommodation for two squadrons. The cost of erection has been 2,540*l.* The buildings were erected from the designs of Messrs. Nowell, Parr, & Kates, architects, of Brentford.

PRIVATE ASYLUM, DUNDEE.—The new building which the Directors of the Dundee Royal Asylum have erected at Westgreen is now almost completed. The building has been designed by Mr. T. S. Robertson, architect, Dundee, and has accommodation for about sixty patients. The style is Scottish Baronial, and in the erection of the building red stone from Ayrshire has been used in dressing, while local quarries have supplied the rubble. The centre part, containing the principal entrance, is of one story, and the wings to the front three stories, while to the back the wings are only two stories. The doorway is embellished with the Royal Arms, the Dundee Arms, and the Arms of Captain Clayhills Henderson, and is approached by a short balustraded staircase which leads from a wide terrace. The entrance hall will be used as a reception-room and also as a ballroom when occasion requires. The west wing is to be devoted to the male patients and the east wing to the females, and each is fitted up for its special purpose. Each wing has a large dayroom. In the men's there will be billiard-tables and other means of recreation, while the women's is to be furnished more after the manner of a drawing-room. There is another and smaller dayroom in each wing. The bedrooms are upstairs, and there are lavatories and bathrooms attached to the various sections of the building. The dining-room is situated immediately behind the entrance-hall, and is a large room with timber ceiling, lit with windows from both sides. The kitchen is immediately behind, and the scullery, pantry, and larder adjoin it. There is also the necessary accommodation for the matron and the servants. The building throughout is heated by steam and lit by electricity. The cost of the new asylum has been over 22,000*l.* The contractors were:—Mason, Mr. William Bennet; joiners, Messrs. D. P. How & Son; plumber, Mr. David Brown; plasterer, Mr. James Laburn; slater, Mr. A. Buttar, jun.; glaziers, Messrs. Lindsay & Scott; bells and blinds, Messrs. J. Pullar & Co.; heating, &c., Messrs G. H. Nicoll & Co.; firecocks and water pipes, Messrs. P. Nucator & Son; roads, Mr. Peter Girrity; carving, Mr. James Bremner; painters, Messrs. Petrie & Greig; drains, Mr. Peter Bain; electric lighting, Messrs. J. Muckersie & Co.; clerk of works, Mr. James Robertson.

DRILL HALL, BILSTON.—This building was recently completed. It is situate at Mount Pleasant, and is partly built on the site of the old drill shed. The building consists of a large hall with officers' and sergeants' rooms in front, while leading out of the hall at the back are the armoury, store room, kitchen and lavatories. Above the rooms in front, but with a separate entrance, are the quarters for the sergeant-instructor. The floor of the hall is composed of wood blocks, and the whole place has been wired for the electric light. Gas has also been temporarily laid on. The building is of red brick with stone facings, and the roof is of red tiles. Over the main door are carved the Royal Arms. Mr. H. T. Hare, of London, was the architect, and Mr. T. Tildesley, of Willenhall, has been the builder. The cost of the building will be 2,600*l.*

TEMPLE OF MUSIC, WOLVERHAMPTON EXHIBITION.—One of the principal buildings which will be erected on the site of the Wolverhampton Art and Industrial Exhibition is the concert-hall. It will have a raised floor, and accommodation is provided for an organ and a large number of performers. Within its walls some 2,000 people will be able to listen to the music. Messrs. Walker & Ramsay, of Glasgow, are the architects.

CHANCEL SCREEN, ST. NICHOLAS CHURCH, BRISTOL.—The new chancel screen which has been erected at St. Nicholas Church, Bristol, was dedicated recently by the Archdeacon of Bristol. The screen has a base of Bath stone, ornamented with six panels, each of which has a shield. Immediately opposite the centre aisle of the nave there are double gates of wrought iron embellished with Greek and Roman symbols. The top part of the screen is composed of wrought iron, worked with arcading, capped by a figured border. At the apex of the central arch is a cross, with the sacred monogram underneath. The decoration is being carried out by Messrs. Joseph Bell & Son, under the direction of the architect, Mr. W. V. Gough.

TOWN HALL, ALTRINCHAM.—Altrincham Town Hall, erected at a cost of 6,000*l.*, was opened on the 4th inst. The town hall was built from the designs of Mr. Charles Hindle (Manchester and Eccles), in the Jacobean style.

EXTENSION OF BIRMINGHAM HOMŒOPATHIC HOSPITAL.—An extension of this building is nearing completion. Having decided to increase the accommodation, the work was placed in the hands of Messrs. Crouch & Butler, who made designs in keeping with the existing premises. Addition will be made to the ward accommodation, and the hospital, when the new wing is completed, will be able to provide beds for forty-two patients. But the extension applies principally to the administrative block, and here better provision is being made for the staff. The extensions, which will cost close upon 5,000*l.*, include, in addition to a few extra wards, a board room and lady superintendent's office, considerable additions to the servants' hall and kitchen, improved accommodation in the way of bedrooms, sitting and dining rooms for the staff, and apartments for the lady superintendent.

NEW BUILDINGS, LEEDS HOSPITAL FOR WOMEN AND CHILDREN.—The erection of the new Hospital for Women and Children in Leeds has been begun. According to the plans of Messrs. Chorley, Connon, & Chorley, the present building will be incorporated in the scheme. This has been rendered possible by the fact that for the present a maternity department is not included. Until sufficient funds are forthcoming to enable the Committee to rebuild the present structure it will be used for a children's ward, and for accommodation for the nurses and servants, as well as for the kitchen department. The new portion will comprise a hospital with accommodation for fifty beds, and an out-patient department.

FIRE STATION, SALFORD.—The Corporation of Salford recently determined to erect a new central fire station in Albion-place, the Crescent, to accommodate the men, horses, and appliances in comfort and convenience, and they applied to the Local Government Board to borrow 26,285*l.* for the purpose of erecting the new station. Colonel W. Langton Coke, M.Inst.C.E., held an inquiry on the 8th inst., at the Salford Town Hall, into the application. There were present Alderman Shaw, chairman of the Fire Brigade Committee; Mr. Corbett, Borough Engineer; Mr. H. Kirby, architect appointed to draw the plans; and others.

WESLEYAN LECTURE-HALL, CHELTENHAM.—A lecture-hall, with a seating capacity of 250 seats, and a church parlour in connexion therewith, have been added to the Wesleyan chapel and schools, St. George's-street, Cheltenham. The building has been erected by Mr. Amos Wilson, of Cheltenham, from the plans of Mr Arthur Geo. Dalzell, architect, of Halifax, and Mr. Thomas Malvern, surveyor, of Cheltenham, has superintended the work during the course of construction.

GRAND OPERA HOUSE, YORK.—A new theatre is being erected on the site of the old Corn Exchange, York. It will occupy when completed an area of upwards of 13,000 sq. ft., and will have frontages to Clifford-street, King-street, and Cumberland-street. The architect is Mr. John P. Briggs, of London. The building is being constructed mainly of red brick and terra-cotta. A complete plant for electric lighting is to be laid down. Mr. F. Sheppard, of York, is the contractor for the building, and Mr. S. King Sheldon is acting clerk of works.

SANITARY AND ENGINEERING NEWS.

ELECTRIC LIGHTING WORKS, HECKMONDWIKE.—These works are rapidly approaching completion. The station is situated in Bath-road, and is part of a building which is also being adapted for the purposes of public baths and fire station, and which extends into High-street. The *Batley Reporter* states that the original scheme provided for two water-tube boilers, made by Messrs. Stewart & Co., each capable of evaporating 4,000 lbs. of steam per hour, with a working pressure of 160 lbs. to the square inch, and also capable of working safely up to 200 lbs. In view of the extensions required for the purposes of the British Electric Tramway Co.'s scheme, the Town Council are also installing one of Messrs. Babcock & Wilcox's water-tube boilers, to work at the pressure above named, and with a capacity for evaporating 9,000 lbs. of steam per hour. This boiler has also a super-heater. The Green's economiser of ninety-six tubes fixed in the main flue will heat water up to 230 deg. before it goes into the boiler. Two boiler feed pumps have been fixed, each capable of supplying 1,500 gallons of water per hour, one being of the Blake Knowles' type, and driven by steam, and the other a three-throw pump by the same maker, driven by electric motor. Each boiler is fitted with an injector. The main steam piping is of lap-welded steel, and is supplied by the same makers as the boilers, whilst the valves are of the Hopkinson make. The two steam generators are each capable of developing 75 kilowatts, and they will run at 460 revolutions per minute, and are both capable of developing 25 per cent. overload without injury. The engines were made by Messrs. Reavel & Co., Ipswich. The generators, &c., are by Messrs. Fowler & Co., of Leeds, and work at from 460 to 500 volts. Storage batteries are capable of discharging at the rate of 160 ampères for three hours, and were made by the Tudor Accumulator Co. The main switchboard, with the usual instruments and switches, is by Mr. Bertram Thomas, of Manchester. An overhead travelling crane has been erected in the engine-room, for use when the larger engines are put into the works at some future time. About 5,000 yds. of underground mains have been laid in the principal thoroughfares of the town by Henley's Telegraph Works Co., London, who are also supplying existing gas lamps with the electric glow lights. Along the entire route of the electric cable these glow lamps will take the place of gas for public lighting, and ten "M.D." arc lamps by Messrs. Foote & Milne, London, are being placed in the centre of the town. These are enclosed arc lamps, and burn 150 hours without trimming. The station is being lit up by Mr. Fred Spivey, of Heckmondwike. The plant is capable of supplying 6,000 8 c.-p. lamps, 3,100 of which have already been applied for. Mr. W. C. Hawtayne is the consulting engineer, and Mr. G. H. Carter the resident electrical engineer.

ELECTRIC LIGHTING, KING'S LYNN.—An addition

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to the Corporation Electricity Works was inaugurated on the 23rd ult. The plant originally consisted of five gas engines, each driving a 40-kilowatt dynamo. These being found insufficient for the increasing demand for current, it was decided last year to add two high-speed steam engines, by Messrs Belliss & Morcom, coupled direct to the dynamos, by Messrs. Laurence, Scott, & Co., of Norwich, one of them of 120 and the other of 200 kilowatts. The smaller one was started in April last, and on the 23rd ult. the Mayor turned on steam to the larger one. The extensions are now complete with the exception of the second Lancashire boiler, which will be fixed shortly after Christmas. It was intended to run the steam plant in the ordinary course, keeping the gas engines as a reserve. The engineer is Mr. J. Palling, of King's Lynn.

PROMENADE, BLACKPOOL.—Colonel Durnford, an inspector of the Local Government Board, held an inquiry at Blackpool, on the 12th inst, into the Corporation's application to amend the Improvement Act of 1869, so as to allow the Promenade being widened 100 ft., at an increased cost of 40,000*l.* Mr. Fletcher opposed on behalf of William Eaves and others. The Town Clerk (Mr. T. Loftos) addressed the inspector for close upon an hour. Mr. J. S. Brodie, the Borough Surveyor, said he had had twenty-five years' experience in fighting the sea in some form or another. His previous experience had been at Liverpool and Whitehaven. He proceeded to say that the crowded state of the Promenade must convince any reasonable mind as to the necessity for its being widened. The existing form of hulking had been abandoned by almost all engineers, owing to its original cost, and its maintenance had been found to be excessive in the extreme. Blackpool had been an exception to the rule, for 52,000*l.* had been spent on repairing the present hulking. The face of the new hulking would be of basaltic stone, granite, and other hard rock. There would be a bull nose at the top extending 27 in. westward, and this, together with a spray of water from the top rail, would deal with drifting sand. Under the new roadway there would be a subway for all the electrical, &c., wires, so as to prevent the continual upheaval of the roads. The cost of a sloping hulking would be 60*l.* per lineal yard, and of the concave wall 30*l.* per lineal yard. The cost of maintaining the former would be three times that of the concave wall.—Mr. Sandyman, a Newcastle engineer, said he had considered the plans and the proposals of Mr. Brodie, and agreed entirely with them. The inquiry was adjourned.

PROPOSED NEW WORKS, WALLASEY FERRIES.—Colonel A. G. Durnford, R.E., an inspector of the Local Government Board, attended at the Public Offices, Church-street, Egremont, on the 15th inst, for the purpose of inquiring into an application of the Urban District Council of Wallasey for a Provisional Order to amend the Wallasey Improvement Act of 1872, to enable the Council to borrow (1) 5,200*l.* for the purpose of providing workshops in connexion with their ferries undertaking on land proposed to be leased from the Mersey Docks and Harbour Board; and (2) 11,000*l.* for general purposes of the ferries undertaking, being improvements and extensions at Seacombe Ferry.

FOREIGN.

FRANCE.—M. Guillotin, the President of the Tribunal of Commerce, has submitted to the Municipal Council of Paris a scheme for the transformation of the Champ de Mars, which includes retaining the two end portions of the Galerie des Machines, the centre being removed to allow of a view of Gabriel's facade of the Ecole Militaire.——A committee has been formed in Paris, with M.Gerôme as chairman, for the erection of a monument to the memory of the celebrated caricaturist Gavarni.——M. Dalou has been commissioned to execute a large allegorical bas-relief for the facade of the crematorium in Pere Lachaise cemetery.——The jury in the competition at Soissons for a public abattoir has awarded the first premium to M. Félix Piat, of Paris.——A new pavilion is being erected at the Paris Observatory for special observations to be made simultaneously at Paris and at Greenwich.——Parliament is occupied with a scheme for a new line of metropolitan railway from the Place du Palais Royal to the Place du Danube.——Madame Lardin de Musset, sister of Alfred de Musset, has offered to the city of Paris a statue of the poet, on condition that it should be erected on the Place du Théâtre Francais.——The Government intend to rebuild the Imprimerie Nationale, which at present occupies an old historic house in the Rue Vieille du Temple, in the Grenelle district.——The Paris Municipality propose to re-erect, in one of the two squares adjoining the church of St. Germain des Près, some curious arcades preserved at the demolition of a house in the Rue de l'Abbaye, and which formerly formed a portion of the chapter-house of the Abbey of St. Germain-des-Près.——Several new Mairies in the suburbs of Paris are to be the object of important works in artistic decoration. Among them are those of Neuilly, Ivry-sur-Seine, and Choisy-le-Roi. The decoration is to consist of landscapes reproducing or suggesting views in the environs.

UNITED STATES.—The State of Michigan is about to replant with forest trees large tracts of sandy wastes whereon once grew what were thought some years ago to be inexhaustible forests of white pine It is the belief of American experts in forestry that had these forests been treated with reasonable care thirty years ago, there would still be an immense annual yield of timber from these now barren wastes. ——The report of the engineers, Messrs. E. Duryea, jun., and Joseph Mayer, on the condition of Brooklyn Bridge shows that that structure is in danger, due to the continually increasing loads placed upon it since it was erected, and it appears, from the action of officials also, that the bridge is unsafe.—— The directors of the St. Louis Exhibition of 1903 invite architects to submit before July 1, 1902, a list of such works as the latter desire to exhibit, including drawings, &c., of completed buildings, designs and projects for buildings, paintings, and mural decorations.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —The Electric Lighting Boards Company have removed their Sales Department to 9, Grosvenor-mansions, Westminster, which will be their principal depôt, and to which all inquiries as to goods should be addressed.——Messrs. Heron & Bellairs, architects, have removed their offices from 27, Fitzroy-street, W., to 27, Sackville-street, Piccadilly, W.

WEIGHTS AND MEASURES AND THE METRICAL SYSTEM.—An Order in Council of May 10, 1898, legalised certain new denominations of metrical standards derived from the iridio-platinum linear standard metre and the iridio-platinum standard kilogram as deposited in the Standards Department of the Board of Trade at Old Palace-yard, which have since been included in the official standards for purposes of the Weights and Measures Act, 1878. An Order in Council of November 4 current fixes the scales to be paid to inspectors in respect of the verification and stamping of weights, measures, and weighing instruments of the metrical system. For measures of length—a mètre and under, a double mètre, and a dekamètre, with their sub-divisions; of capacity—from 0·001 litre to a double dekalitre; and of cubical contents—from 1 cubical centimètre to 1,000 cubical centimètres, the scale of fees ranges from 1d. to 3d. The same scale is ordained for weights that range from 1 milligram to 20 kilograms, whilst the scale varies from 2d. to 10s. in the case of weighing instruments for from 0·5 kilogram and under to 10 tonnes, or 10,000 kilograms and above.

BIRMINGHAM MASTER BUILDERS' ASSOCIATION.—The annual meeting of the Birmingham Master Builders' Association was held on the 11th inst. at the Grand Hotel, Councillor F. G. Whittall presiding. In the report for the year the committee regretted that the falling off of trade referred to twelve months ago had become more marked, and much work that would probably not now be executed had been held back owing to the high prices of material and labour. The committee felt strongly that the present high rate of wages was no longer justified by the state of trade, and they had received from individual members many complaints as to the great inconvenience resulting from the present arrangement of several trades commencing and leaving off work at different hours. Consequently they had served notices on all trades for a general reduction of wages and for uniform hours of work. The Committee felt they would be voicing the opinion of every member of the Association by expressing to the Chancellor of the Birmingham University their regret that Birmingham architects had been excluded from a competition for the University buildings. The balance-sheet showed that the receipts for the year were 181*l.*, which, with the balance from last year, made a total of 308*l.* The various disbursements amounted to 154*l.*, leaving a sum of 214*l.* to the credit of the Association. In proposing the adoption of the report, the Chairman referred to the state of the trade, which, he said, continued to be unsatisfactory. The large number of workmen that called upon them to obtain work showed that trade must be in a very bad state. It was because of the condition of the trade that the Committee, after careful and anxious thought, had deemed it advisable to give notice for a reduction of wages. It had not been done to cause differences or disagreements in the trade, but for the purpose of trying, if possible, to stimulate trade, which had suffered through the high price of material and labour. A great deal of work had been put aside until it could be done more cheaply, and they considered the reduction of wages would be in the best interests of the trade and the workmen. He hoped the operatives would accept the reduction. The Committee had taken some amount of trouble and effort to assist the funds of the Birmingham University, and therefore they keenly regretted that the architects of the city had no opportunity of competing for the designs of the new building. Mr. W. Sapcote seconded the resolution, which was carried. Mr. Albert S. Smith was elected President for the ensuing year, and Mr. John Barnsley vice-president. Mr. G. Twigg was reappointed treasurer, Mr. E. J. Bigwood secretary, and Messrs. T. Johnson and J. S. Surman auditors. The Committee were also elected. In order to strengthen financially the position of the Association, it was decided that, from the commencement of next year, the annual subscription should be 1s. for each 100*l.* of wages paid during the previous year. The retiring President, Councillor F. G. Whittall, was heartily thanked for his services during the year. In the evening the annual dinner was held at the Grand Hotel. The Lord Mayor (Alderman J. H. Lloyd) presided. The customary loyal toast having been honoured, Major Barnsley submitted "The City and Trade of Birmingham." The Lord Mayor replied to the toast. He spoke of the necessity of looking ahead to prepare for the requirements of the city, and said that it was the support of the citizens that helped a city like Birmingham to keep abreast of the times. With regard to jerry-building, he said that whatever might have been the case in the past they did not have jerry-building in Birmingham now. Some of the builders might think that the by-laws were hard and strict, but he knew they themselves were anxious that buildings should be put up properly and well. He hoped as time went on some of the slums would be cleared out, and the buildings of the town improved. Mr. C. E. Bateman, in proposing "Success to the Birmingham Builders' Association," expressed the hope that some members of the Association would secure the contracts for the new University buildings. The President (Mr. A. S. Smith) replied, and referred to the proposal to reduce the operatives' wages. The Association, he said, was not formed for the purpose of cutting down the men's wages, and they regretted that it was necessary to interfere with them. No one grudged the operative a good wage, but what they did resent very much was that restriction of output, that constant lessening of the amount of work which the unions encouraged. Other notices had been served upon the operatives having reference to certain unreasonable restrictions in trade rules which they were glad to have an opportunity of discussing, and they sincerely hoped all the matters would be amicably settled.—The other toasts were "The Architects and Surveyors," "The National Federation of Building Trade Employers," and "The Visitors."

WAR MEMORIAL, BRISTOL.—It is proposed to erect at Bristol a memorial to some of the soldiers who have fallen in South Africa. It has been arranged that the memorial shall be placed in College Green, on a site selected by the Dean and Chapter. The design has been prepared by Mr. Fred. W. Marks, architect, of London. The obelisk will consist of a bold shaft of Swedish red polished granite, with decorative fluting and ornamental design on the lower part of its sides. The base on which this shaft will rest is to be of polished green granite, and this in turn will stand on grey granite steps. Its site is to be surrounded by twelve grey granite posts, connected by heavy bronze chains. Upon the monument will be the following inscription:—"This obelisk is erected to the memory of Christian Victor, Prince of Schleswig-Holstein, and to the officers and men of Gloucestershire, Somersetshire, and Devonshire Regiments, who fell during the Boer War, 1899-1901, by Alfred Mosely, born in this city." The canopied bronze tablets on the four sides of the base will be noticeable parts of the design; and there will be smaller tablets containing the names of engagements in which soldiers from the three counties took part. The obelisk will be 41 ft. in height from ground level to the top.

DANIEL OWEN MEMORIAL STATUE, MOLD, FLINTSHIRE.—The statue erected in Mold to the late Daniel Owen, the Welsh novelist, was unveiled recently by Lord Kenyon. The statue is in bronze, and, erected upon a pedestal of Flintshire stone, stands in front of the County Hall. The figure is life-size. The statue is the work of Mr. Goscombe John, A.R.A.

METROPOLITAN ASYLUMS BOARD.—An ordinary meeting of the Managers of the Metropolitan Asylum District was held at the offices on the Embankment on Saturday last, Mr. R. M. Hensley, the Chairman, presiding. A letter was read from the Local Government Board formally approving the plans of the Southern Hospital; promising an order authorising an expenditure of 284,312*l.* on that hospital, and the borrowing of that sum; stating that the loan should be repaid as to 264,312*l.* in thirty years, and as to 20,000*l.* in fifteen years; and that Managers would be expected to adhere as nearly as possible to the estimated cost in carrying out the works. At the last meeting of the Board it was decided to complete forthwith the permanent hospital at Joyce Green by the erection of the remaining twelve blocks and the isolation block for patients, and the Works Committee were instructed to advise the Managers as to the course to be adopted for giving effect to that decision. It was now resolved, on the recommendation of the committee, that, subject to the sanction of the Local Government Board, the Managers should accept the offer of Messrs. Leslie & Co., Limited, the contractors for the erection of Joyce Green Hospital, to erect and complete the remaining twelve pavilions, isolation hospital, and other works connected therewith at a schedule of prices based on their contract for the main portion of the hospital, in accordance with plans and specifications prepared by Messrs. A. & C. Harston, architects.

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LEGAL.

ACCOUNTS INCURRED ON BUILDER'S BEHALF:

LIABILITY OF CLIENT AND ARCHITECT.

At Brompton County-court, last Friday, before Judge Stonor, Mr. Frederick F. Scruby, English agent to the Lincrusta-Walton Company, Berners-street, W., brought an action against Mr. Thomas Dan Chapman, proprietor of the Wheatsheaf public-house, Goldhawk-road, Shepherd's Bush, W., claiming 23*l.* 16*s.* 9*d.* for Japanese wall-paper said to have been supplied to order.

Mr. A. W. Groser, counsel, appeared for the plaintiff, and Mr. J. Oliver, counsel, defended.

Counsel for plaintiff explained that the claim had been remitted from the High Courts. It appeared that in January last the plaintiff received a call from a Mr. Richardson, architect, Shepherd's Bush, who said that he was acting as architect to Mr. Chapman, in connexion with certain works of reconstruction, &c., at the Wheatsheaf, being carried out by a Mr. C. W. Knight, builder. Mr. Richardson spoke about certain expensive Japanese papers being supplied for the job, and when the plaintiff remarked that he was not acquainted with the builder, Knight, Mr. Richardson replied, "That is all right: you supply my client"—referring to the present defendant—"with the papers, and I, as the architect, will have moneys in hand before the final certificate is given, and I will see that you are paid." The plaintiff thereupon agreed, and Mr. Richardson selected certain patterns. About three days later Mr. Chapman came with his architect and saw other patterns, and requested the plaintiff to send certain of the papers to the Wheatsheaf as soon as the builder sent word as to the quantity required. Subsequently Mr. Knight, the builder, wrote the plaintiff as to the quantity, and goods to the amount of 80*l.* odd were then supplied, and used at the Wheatsheaf. Off the account 35*l.* had been paid by a cheque drawn by the defendant. On May 11 the plaintiff was rung up on the telephone by Mr. Richardson, who said: "I want you to issue a writ against Knight, and if unsuccessful, then issue a friendly writ against Chapman, so that I may be able to show that I have paid for these goods." The learned counsel went on to describe this as "a very 'cute trick," for Knight was then on the verge of bankruptcy, and had the plaintiff sued him and failed to get the money, he could not afterwards have sued the present defendant. The plaintiff issued a writ against Knight, who, however, set out in an affidavit the relations existing between himself and Mr. Chapman, and the action was at once discontinued. Then the present proceedings were initiated.

The plaintiff bore out his counsel's opening statement.

Mr. Groser: The architect was, of course, the principal's agent.

The Judge: An architect would not necessarily have authority to pledge the principal's credit.

A duplicate of the document sent by Knight, giving particulars as to the quantity of goods required, was produced, when it was found that it began, "Please send me," &c. The receipt for the 35*l.* also was made out in Knight's name.

Mr. Charles William Knight, the builder referred to above, said that the plaintiff's action against him for the amount of the goods in question was discontinued as soon as it was known that he had become bankrupt. The goods in question were ordered by his foreman on his (witness's) behalf.

The Judge said it was useless for plaintiff's counsel to continue in face of the documents indicating that Mr. Knight had ordered the goods, and that the 35*l.* was paid on his behalf. No doubt, added his honour, the case was one of great hardship as regarded the plaintiff, but there was no liability on the part of Mr. Chapman, although there might be some on the part of Mr. Richardson. The documents relating to the case would have to be preserved. There would be judgment for the defendant with costs.

WIDOW'S CLAIM UNDER THE WORKMEN'S COMPENSATION ACT, 1897.

The case of Sarah Bush *v.* G. E. Hawes came before the Court of Appeal composed of the Master of the Rolls and Lords-Justices Stirling and Mathew on the 14th inst, on the appeal of the applicant from a decision of the County Judge of Norwich, sitting as Arbitrator under the Workmen's Compensation Act, 1897. It appeared that the applicant was the widow of a labourer who, while working at Lowestoft on October 2, 1900, met with an accident which resulted in his death, under the following circumstances. The deceased was in the employ of Messrs. Hadley & Sons, who were sub-contractors of the respondent Hawes, who was building a new fish-curing factory. The actual work on which the deceased was employed at the time of the accident was a boiler-house, the roof of which had not been completed. The boiler-house without the foundations was 28 ft. 4 in. high and with the foundations 30 ft. 4 in. high. To the boiler-house was attached a chimney-stack 100 ft. high. The deceased while engaged in guiding a rope by which the roofing was being hoisted to the top of the boiler-house, stepped back, and in doing so placed his foot on a nail sticking out of a board, and afterwards died of lockjaw. His widow accordingly claimed compensation under the Act. The County-court Judge, besides finding that the man did not meet with the accident in the course of his employment, held further that his widow was not entitled to compensation because the building on which he was engaged at the time of his accident was not 30 ft. high within the meaning of the Act. Hence the present appeal of the applicant, on whose behalf it was contended that the chimney-stack was a part of the building, which was therefore upwards of 30 ft. high. As to the other point, said the appellant's counsel, it was thought the other side would admit that the man met with his accident in the course of his employment. There was a cross-appeal by the respondent, who argued that the County Court Judge was wrong in holding that the work upon which the deceased was engaged was not ancillary to, but a part of, the business of the "undertaker" (respondent).

At the conclusion of the arguments of counsel, the Master of the Rolls said he was of opinion that the cross-appeal must be allowed. The claim was made by the widow of a workman who met with an accident while working as the servant of a sub-contractor who had undertaken to put an iron roofing on a building erected by the respondent, the "undertaker." In order that the applicant might succeed in such a case—assuming that it had been shown that the accident arose out of the man's employment, and that the building was 30 ft. high—she must bring herself within the proviso of Section 4 of the Act, which was to the effect that the "undertaker" was not liable if it could be shown that the work upon which the man was engaged was merely ancillary or incidental to and not part of the business of the "undertaker." If the work (roofing in this case) was not part of the trade and business of the respondent, and he had not undertaken to do it, then the applicant had no remedy against the respondent. The County Court Judge had found as a fact that this work of iron roofing was not part of the trade or business carried on by a builder, but he said that the section did not apply in this case because the respondent was in the habit of doing this kind of work. There was no evidence of that, and the learned Judge was wrong in so holding. This was a complete answer by the respondent to the claim of the applicant. It was not necessary, therefore, to deal with the other questions raised in the case, but he thought that but for this decision that the work was ancillary to the business of the respondent the applicant would be entitled to recover.

The Lords Justices concurred, and the appeal of the applicant was accordingly dismissed, and the cross appeal of the respondent allowed.

Mr. W. M. Thompson appeared for the applicant, and Mr. F. Lowe for the respondent.

CITY NUISANCE CASE.

The case of Parish *v.* the Mayor, &c., of the City of London came before Mr. Justice Joyce in the Chancery Division on the 14th inst., an action by the plaintiff, the lessee of premises, No. 8, Churchrow, Aldgate, for a mandatory injunction against the defendants to compel them to pull down an urinal which was erected so close to the plaintiff's premises as to constitute a serious nuisance and injury to his property. It appeared that Churchrow is a *cul-de-sac*, the plaintiff's premises being situated on one side at the end of the court, which formed a public thoroughfare for foot passengers. The defendants erected the urinal complained of under powers conferred upon them by Section 104 of the London Sewers Act 1848, and placed it at the end of the court, close to the wall of the plaintiff's premises, the entrance to it being only 2 ft. from the plaintiff's only doorway. The plaintiff's case was that the urinal was a serious nuisance to him, and that in consequence of it he could not let his premises. The defendants' case was that they were acting in the *bonâ-fide* exercise of their powers, which enabled them to erect such places for the accommodation of the public, and that in consequence of their action the condition of the court was much improved.

In the result his lordship came to the conclusion that the defendants had no power to erect the urinal where they had done, and that it constituted a nuisance to the plaintiff. He therefore made a mandatory order upon the defendants to remove the urinal within six weeks, and directed them to pay the costs of the action.

Mr. Hughes, K.C., and Mr. Percy Wheeler were counsel for the plaintiff; and Mr. Badcock, K.C., and Mr. J. Henderson for the defendants.

A BRICKLAYER'S LABOURER'S CLAIM UNDER THE WORKMEN'S COMPENSATION ACT, 1897.

The case of Field *v.* Longden & Sons came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 15th inst., on the appeal of the defendants, Messrs. Longden & Sons, the employers, from the award of the County Court Judge of Sheffield, under the Workmen's Compensation Act, 1897.

The applicant was a bricklayer's labourer, injured by an accident in the course of his employment on October 20, 1900. His average weekly earnings at the time of the accident were 30*s.* The employers commenced making weekly payments to the applicant of 15*s.* a fortnight after the accident, and this was continued till April 10, 1901. A few days subsequently the applicant's solicitor wrote to the defendants a letter with reference to the accident, and stating that he would be glad to hear of an offer of compensation, and that his letter was to be taken as a notice of injury and a claim for compensation. The defendants replied that they were paying the applicant the full weekly allowance, and that they were willing to continue the payments during his incapacity. After further correspondence, the applicant mentioned a lump sum which he was willing to accept, but this the defendants refused to pay. The defendants afterwards, as the result of a medical examination which they had made of the applicant, offered another lump sum to the applicant, but this the latter refused. On April 25 the applicant filed a request for arbitration, claiming 15*s.* a week during incapacity. At the hearing, the applicant gave evidence to the effect that there had been no agreement to settle either by lump sum or weekly payment, and although the defendants had never disputed liability, they had never admitted it. He contended that he was entitled to have an award in his favour. The defendants contended that there was no question to arbitrate upon, as the applicant had been regularly and fully paid by them since the accident. The county-court judge held that the applicant was entitled to an award, and made an order for a weekly payment of 15*s.* during incapacity. From this decision the defendants now appealed, on the ground that the county-court judge had no jurisdiction to make an award, first, because no question had arisen between the parties within the meaning of Section 1, Sub-section 3, of the Act; and, secondly, because if any question had arisen, it had been settled by agreement.

At the conclusion of the arguments of counsel their lordships held that no question ever did arise between the applicant and the defendants either as to the liability to pay compensation, or as to the amount of compensation, or as to the duration of compensation. There was, therefore, nothing to arbitrate upon. The appeal was accordingly allowed, and judgment entered for the defendants.

Mr. Manisty, K.C., and Mr. Wilberforce appeared for the appellants, and Mr. Danckwerts, K.C., and Mr. A. Sims for the applicant.

CASE UNDER THE PUBLIC HEALTH (LONDON) ACT, 1891.

Mr. Justice Joyce, in the Chancery Division, on the 19th inst., delivered a considered judgment in the case of the London and North-Western Railway Co. *v.* the Mayor, &c., of the City of Westminster, in the action brought by the plaintiffs for an injunction restraining the defendants from continuing to trespass upon premises of the plaintiff company at the corner of Parliament-street and Bridge-street, Westminster.

It appeared that a portion of the corner house abutting on Parliament-street was used by the plaintiffs as offices, and that the defendants had constructed underneath the middle of the street public conveniences, with approaches, by means of subways, from either side of the street, the entrance to the subways being by means of staircases near to the edge of the pavement. The plaintiffs complained that the entrance and staircase to the extent of 2 ft. 9 in. was constructed, not in the roadway, but in the footway, and alleged that to this extent it constituted a trespass upon their property, as the Public Health (London) Act, 1891, only vested the soil of the roadway in the defendants, the soil of the footway being, by presumption of law, vested in the plaintiffs as owners of the adjoining property. The plaintiffs further said that the defendants had no power to make subways under the street.

The defendants justified their action under Section 44 of the Public Health (London) Act, 1891, which gave them power as the Sanitary Authority to provide public conveniences in places where they considered the same were required.

His lordship held, on the evidence, that the land or soil where the staircase was constructed as to 2 ft. 9 in. was the property of the plaintiffs, and, being part of the footway, not liable to be taken and used by the defendants under the Act of 1891 for the construction of the convenience, and granted an injunction for the removal of that portion of the staircase. He thought that the order would do the plaintiffs no good, as the defendants could, if they chose, simply put the staircase 2 ft. 0 in. further into the roadway, so making it stand clear of the footway as it was before the works were commenced. His lordship declined to make an order (as asked for by the plaintiffs) compelling the defendants to restore the old line of the kerb or edge of the footway as it existed at the end of 1889, and stayed the operation of the injunction for six months, with liberty to apply for a further stay in the event of an appeal by the plaintiffs from his decision

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Judgment accordingly.

Mr. Younger, K.C., and Mr. Montague Shearman appeared for the plaintiff company, and Mr. Hughes, K.C., and Mr. D. Pollock for the defendants.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

13,109.—FLUSHING APPARATUS: *S. J. Asbell.*—In order to prevent the freezing of the water a rod joins the closet-seat to a weighted lever at the end of a spindle upon which (in the valve-casing) is an arm; at the end of the arm are side-pins to which are pivoted rods that carry conical valves upon their ends. The flushing-pipe which leads to the basin, the service-pipe, and a draining-pipe that leads to the trap are joined to three nipples respectively, so that the flush will be started as one valve opens and another valve closes with the depression of the seat, but as the seat rises the one valve is closed to arrest the flush, and the other valve is opened for draining the flushing-pipe and the valve-casing.

13,116.—TACKLE FOR LIFTS, &C.: *C. F. Kite.*—A brake-box contains the driving-shaft, with a loose disc and a split brake-ring. In the disc and the pulley are recesses with which the two ends of a double crank respectively engage; a short shaft, having an elliptical section, joins the two cranks, and is passed between a fork upon the brake-ring, the disc being keyed loosely on to the driving-shaft. The pulley and disc will move slightly as regards one another when the power is removed, so as to partially rotate the short shaft in the fork, whereupon the brake-ring expands as it comes into play. In a system of adjustable pulleys for an alignment of the ropes of lift-cages the ropes are passed around pulleys, upon arms, of which the upper ends rest against inclines upon the pulley-frame, and which are bolted in slots cut in the inclines.

13,129.—PROCESS OF MOULDING BRICKS: *O. Jaeger.*—The moulding-box is divided into compartments with a set of plates upon its movable side, which is mounted on rollers running in channel-iron guide-rails, and is worked with links and a lever, and the bricks are perforated with core rods; the ends of the rods and plates fit into recesses cut in the opposite and fixed side of the box; vertical sliding-rods worked with a treadle carry a plate beneath the loose bottom plate. In a variant form the inventor devises hand-wheels, pinions, and racks for working the movable side and bottom, and the pawls that retain them in their places are maintained in engagement with the racks by means of springs; handles on the shafts which carry the pawls turn the springs out of action.

13,168-9.—CONCRETE PAVEMENT: *J. Ward.*—To a body of large-gauged stone that has been broken and tarred and screened is added similar stone of smaller gauge as a filling for the interstices; the compound is rolled to render it solid. For paths reduced gauges are used. 13,169.—The stone which is to be broken is passed from a kiln into a hopper and stone-crusher, whence an elevator lifts the fragments to a hopper, from which they are conveyed to screens disposed on different floors and to the sorting bins. The hot and dry broken stone is then thrown out on to a table in a uniformly heated hut, where it is mixed and tarred.

13,227.—A CONTRIVANCE FOR BAND-SAWS: *J. Rech.*—The inventor's object is to enable the bench of a band-sawing machine to be set at an angle so as to make bevel ends. He forms the bench of two parts that are hinged so that one can turn them upwards at any desired angle and then clamp them with set-screws and curved bars. The band-saw passes between the two flaps at their hinges.

13,248.—AIR OR WATER-TESTING PLUGS FOR DRAIN AND OTHER PIPES: *J. S. Reekie.*—In one shape the plug consists of a flexible disc whereof the diameter is larger than that of the pipe, two metal plates that support the disc about its middle, and a screwed handle. As the disc is drawn through the pipe it becomes compressed into the shape of a cup-leather.

13,251.—A FUEL ECONOMISER FOR STOVES AND GRATES: *J. H. Wilkie.*—Into each side of the fireplace is inserted a vertical grating which is secured to a back and to an angled-plate that will direct the heat into the apartment, a perforated metal plate upon the top of the contrivance will serve as a support for a kettle, pan, &c.

13,257.—MANUFACTURE OF VENEERS: *M. Harrass.*—The veneer is made up of two parts, in each of which the two component veneers are disposed with their grains crossed. A compound veneer consists of a sheet of suitable material laid between two veneers. A hollow veneer is formed by enclosing veneer ribs between two compound veneer slabs. Casein cement should be used for the veneers, which are described as being available for covering vaults, columns, arches, and so on, as well as for making doors, furniture, pianoforte-cases, &c.

13,274.—EXCAVATING MACHINES: *T. Whitaker.*—For steam navvies which are employed for excavating narrow cuttings, a tank or platform carries the boiler, and has two studs that will slide in horizontal slots cut in the frame of the revolving table. There are holes in the side plates of the boiler that take bolts upon the lower ends of pivoted links that are joined with rods to the frame of the crane. The body-wheel is made up of segments having teeth within, and affixed to a circular rim of H-section, of which the ends are fastened with flanged fish-plates bolted together. The plates can thus be separated for the replacement of a segment.

13,278.—CONSTRUCTION OF BUILDINGS IN CONCRETE: *E. L. Ransome.*—Walls and structures are moulded with chambers, cells, or shafts, and in the course of the work heated air, carbonic acid gas, or steam is forced into the spaces to harden the concrete, the draught being controlled by means of openings fitted with doors at intervals, and directed over the upper surface of fresh concrete by means of cores, moulding-boards and a cover. 13,279.—For strengthening the joints of concrete and similar structures, the inventor employs metallic coils that are embedded in the material so as to interlock with the layer next adjacent.

13,282.—BLOCKS FOR BUILDING PURPOSES: *H. G. B. Brunckhorst.*—The slabs or blocks are fashioned with horizontal and serrated grooves, into which liquid cement or mortar is filled through passages formed by grooves in the vertical edges of the blocks. Horizontal wires, joined by vertical wires crosswise that can be moved along the horizontal wires, support and strengthen the walls.

13,285.—A CONTRIVANCE FOR CLOSET SEATS: *R. G. Howson.*—The hinge-pin of the seat is inserted through a hole in a block, and the flushing-horn is made in one piece with the block. The invention extends to a similar contrivance as adapted for a cover of the seat.

13,287.—INTERCEPTING TANKS AND TRAPS FOR DRAINS AND SEWERS: *E. Körting.*—A partition, having a grating for its top, divides the container into two portions; a sliding plate, worked with a hand-screw, controls the height of the weir. In some cases a second dividing plate is suspended from the cover. As the pressure rises the air will escape through cocks at the top of the container.

13,319.—PORTABLE BUILDINGS: *W. T. Chafer.*—Vertical bars which will slide in brackets bolted on to the structure carry its feet or wheels; a pivoted catch, which is kept in its place with a loosely-pivoted weight, is pressed by a stopping-pin on a sliding bar, within which will turn a vertical spindle, which carries the front wheel or castor; for lowering the structure on to the ground one lifts the weight off the catch and lets it fall clear of the stopping-pin on the slide-bar.

13,357.—A SCREW SOCKET FOR ELECTRICAL INSULATORS AND SIMILAR OBJECTS: *J. Monjau.*—A socket. to be inserted into walls of stone or other materials, consists of a blank of sheet metal, which is folded at its middle and is pressed upon a screw passed through the middle hole, whereby screw threads are made in the sheet metal; the end lugs are then folded over one another, and the intermediate lugs are turned outwards.

13,371.—FITTINGS FOR WINDOWS: *A. G. Spencer.*—The inventor fastens the glass frames with wooden strips in the frames and renders the joints watertight with corrugated or ribbed strips of india-rubber, which may have a backing of canvas, or the canvas may be fitted with beads of india-rubber. In another adaptation the edge of the glass is taken by a groove in the strip, and rubber beads are secured to the wooden rail. A moulded rubber ring, cut into four parts, furnishes quadrants for packing windows that have rounded corners.

13,399.—A PROP FOR USE WITH DRAWING-BOARDS: *R. W. Sekatzek.*—A frame for the support and adjustment of a drawing-board is made of two portions—a main frame and an adjustable frame hinged together. At the ends of the main frame are teeth that will engage with a bar attached to two rods which are pivoted on to the movable frame, which has a ledge that retains the board in its place.

13,408.—A GOVERNOR FOR GAS SUPPLY: *J. F. Child & R. J. White.*—Upon a stationary plate is mounted a cylindrical valve which has triangular apertures in its sides and a closed top, and is joined to the gas inlet; around the valve is a sleeve which is connected to the top of the governor, and is dipped into a lubricant in an annular vessel which consists of a fixed sleeve; the governor may be shaped as a bell that dips into a liquid seal around its base-plate, or its top and bottom may be joined with a bellows, its interior being put into free communication with the outlet; the fixed sleeve will gradually shut the inlets as the top of the governor ascends, the openings will be similarly uncovered as the top descends.

13,417.—STONE-SAWING MACHINERY: *J. Gay.*—For sawing stone, in stone-cutting yards, a flexible cutter is passed around guiding pulleys upon a jointed or other frame disposed for cutting out hollow articles, the core being cut away with a wire which is led out over guide-rollers in a hole in the side; in another form the wire is led over rollers mounted upon magnets or electro-magnets, so that it may be kept in irregular paths, and for mouldings and so on templets are used for guiding the cutter. The invention comprises numerous other methods for working the wire, and describes various particular forms of wire, chain, and other flexible cutters as adapted for cutting columns, or hollow or irregularly shaped articles, as well as for quarrying, well-sinking, and tunnelling operations.

13,407.—ARTIFICIAL STONE: *T. M. Thom.*—Pure lime, to which unburned limestone may be added, is slaked with water to the consistency of moulding-paste. The dried goods are put into a closed vessel that can resist an internal pressure of from 300 to 400 lbs. per square inch; carbonic acid gas is then admitted at a pressure beginning from about 30 lbs. and increasing gradually so as to keep the stone at a constant temperature of 90 Fahr. The stones are described as being also suitable, when polished, for use in lithography.

13,491.—BUILDING BLOCKS: *G. E. Güssow.*—The inventor seeks to provide building blocks for fire-resisting and non-conducting purposes and having a low specific gravity; they are composed of an admixture of clay, silicious sinter, magnesite or bauxite, and asbestos fibre, together with some organic substance, such as straw or peat-wood, finely divided; the moulded blocks are burned as ordinary bricks.

13,495.—AN APPLIANCE FOR WINDOWS: *Perfection Window Hinge Co.*—In order to facilitate the cleaning of window-sashes, the inventors make the inside and the parting beads in detachable portions, and arrange the sashes so that one can turn them inwards upon detachable hinges. Into the frame and sashes are screwed bushes having bayonet or keyhole slots, with which bayonet-lugs or pins that project from the shanks of hinge pins and sockets will engage; for detaching the sockets and pivots, they are turned until the lugs are opposite the key-hole slots in the bush-flanges.

MEETINGS.

FRIDAY, NOVEMBER 22.

Architectural Association Discussion Section.—Mr. G. H. Smith on "Canterbury Cathedral," illustrated by lantern views. 7.30 p.m.

Birmingham Architectural Association.—Mr. J. A. Gotch on "Architecture of the Eighteenth Century in England."

Glasgow Architectural Craftsmen's Society.—Mr. G. Herbertson on "Foreign Competition in the Building Trades." 8 p.m.

SATURDAY, NOVEMBER 23.

Carpenters' Hall, London Wall.—Viva Voce Examination in Sanitary Building Construction. 12 noon.

British Institute of Certified Carpenters.—Visit to the Vauxhall Bridge Works. 3 p.m.

MONDAY, NOVEMBER 25.

Surveyors' Institution.—Mr. A. Dudley Clarke on "The Final Report of the Local Taxation Commission." 8 p.m.

TUESDAY, NOVEMBER 26.

Institution of Civil Engineers.—Mr. John A. F. Aspinall on "Train Resistance." 8 p.m.

WEDNESDAY, NOVEMBER 27.

Society of Arts.—Mr. J. Gordon Parker, Ph.D., on "Leather for Bookbinding." 8 p.m.

City of London College Science Society.—Mr. E. R. Calthorpe on "Narrow Gauge Light Railways of Heavy Traffic Capacity." 7.30 p.m.

Northern Architectural Association.—Mr. H. S. Kerr on "Melrose Abbey," with lantern views. 7.30 p.m.

THURSDAY, NOVEMBER 28.

Institution of Electrical Engineers.—8 p.m.

FRIDAY, NOVEMBER 29.

Architectural Association.—Mr. Arnold Mitchell on "Capitals," with lantern views. 7.30 p.m.

SATURDAY, NOVEMBER 30.

Dundee Institute of Architecture.—Paper by Mr. W. M. Page, entitled "Notes on Art." 7 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

November 4.—By LANGRIDGE & FREEMAN (at Snaresbrook).

Snaresbrook.—Tavistock-rd., Home Cottage, f., r. 45*l.*	£675
November 6.—By WM. WESTON (at Paddington).	
Paddington.—6 and 8, Elgin-avenue, u.t. 61½ yrs., g.r. 20*l.*, r. 170*l.*	1,200
23 and 25, Lanhill-rd., u.t. 61 yrs., g.r. 19*l.*, r. 120*l.*	935
71, Chippenham-rd., u.t. 61 yrs., g.r. 9*l.* 10s., r. 50*l.*	505
157 and 159, Ashmore-rd., u.t. 78½ yrs., g.r. 14*l.*, r. 80*l.*	835
Maida Vale.—59, Sutherland-avenue, u.t. 61 yrs., g.r. 12*l.*	600
November 8.—By COOK & BIRMINGHAM (at Exeter).	
Crediton, Devon.—The Winstout Estate, 156½ acres, f.	1,500
November 11.—By ALDER & Co.	
Finchley.—1 and 2, Claybrook Cottages, f., r. 39*l.*	340
Church-lane, Eastworth Cottage, f., r. 38*l.*	530
By WILLIAM HOUGHTON.	
Walthamstow.—Higham-st., The Woodman b.-h., u.t. 38 yrs., g.r. 65*l.*, with goodwill, fixtures, &c.	4,250
Boundary-rd., a block of building land, f.	360
29, Castle-avenue, f., r. 50*l.*	750
Clapham.—Loats-rd., Ravenswood and ¾ of an acre, u.t. 7 yrs., g.r. 1*l.*, e.r. 80*l.*	240
By ROGERS BROS. (at Peckham).	
Peckham.—64, Clifton-rd., u.t. 44 yrs., g.r., &c., 4*l.* 3s., r. 36*l.*	885
6, Rye Villas, u.t. 77 yrs., g.r. 7*l.* 7s., e.r. 36*l.*	390
November 12.—By KNIGHT & Co.	
Hyde Park.—51, Connaught-st., u.t. 21 yrs., g.r. 8*l.* 8s.	635

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By ROGERS, CHAPMAN, & THOMAS.

Pimlico.—11 to 16, Victoria-sq., u.t. 5½ yrs., g.r. 10*l.*, r. 740*l.* £3,005
4 and 5, Albert-st., u.t. 5½ yrs., g.r. 2*l.*, r. 200*l.* 940
255 to 269 (odd), Vauxhall Bridge-rd., u.t. 22½ yrs., g.r. 37*l.*, r. 484*l.* 5,200
10, 26, and 28, Buckingham Palace-rd., u.t. 5½ yrs., g.r. 30*l.*, r. 580*l.* 2,630
Belgravia.—15, Wilton-st., a profit rental of 70*l.* for 9 yrs. 380
8, Lower Grosvenor-pl., u.t. 5½ yrs., g.r. 1*l.*, r. 180*l.* 700
Newington.—137, Newington Causeway, u.t. 52½ yrs., g.r. 62*l.*, r. 362*l.* 3,110
November 13.—By HUMBERT & FLINT.
Lincoln's Inn.—10, New-sq., freehold chambers on ground floor and basement, r. 250*l.* 4,850
Stanmore Hill, Middx.—A copyhold house, shop, and two cottages 800

By HAROLD GRIFFIN.

Battersea—171, Church-rd., f., r. 20*l.* 320
175 and 177, Church-rd., f., r. 58*l.* 610
179, Church-rd., f., r. 30*l.*; also f.g.r. 8*l.*, reversion in 75 yrs. 500
65, Surrey-lane, f. 360
24 and 26, Arthur-st., u.t. 55 yrs., g.r. 5*l.* 4s. .. 410
2, 4, and 6, Freeland-st., u.t. 75 yrs., g.r. 18*l.* .. 495
60 and 62, Shillington-st., u.t. 58 yrs., g.r. 8*l.* .. 330
31, Shillington-st., u.t. 58 yrs., g.r. 4*l.* 195
47, Plough-rd., f., e.r. 40*l.* 400
78 and 80, Cabul-st., u.t. 49 yrs., g.r. 5*l.* 400
17, Trott-st., u.t. 66 yrs., g.r. 4*l.* 10s. 265
9, Freeland-st., u.t. 64 yrs., g.r. 4*l.* 165
Chelsea.—67, Seaton-st., u.t. 416 yrs., g.r. 6*l.*, r. 38*l.* 430
Wandsworth.—115, Harbut-rd., u.t. 77 yrs., g.r. 6*l.* 10s. 275
Putney.—42, Schubert-rd., u.t. 82 yrs., g.r. 8*l.* 8s., e.r. 42*l.* 340

By FRANK JOLLY & CO.

Clapton.—47, Downs-rd., f. 1,660
2, Oakfield-rd., f., e.r. 45*l.* 710

By F. H. B. RIDDLE & CO.

Chertsey, Surrey.—95 and 99, Guildford-st., f., r. 60*l.* 1,210

By RUSHWORTH & STEVENS.

Brixton.—Bishop's-rd., The Mitre Tavern, i.g.r. 100*l.*, u.t. 60 yrs., g.r. 40*l.* 1,060
Clapham.—25, Sandmere-rd., u.t. 78½ yrs.. g.r. 8*l.* 10s. 510

By PHILIP STOCK.

Brixton.—56, Somerleyton-rd., u.t. 65 yrs., g.r. 9*l.*, e.r. 50*l.* 350

By WALTON & LEE (at Oxford).

Bicester, Oxon.—Two freehold residences, r. 27*l.* 520
South View and 1 r. 7 p., f. ¼ 450
An enclosure of land, 4 a. 1 r. 32 p., f. 190
Lords Farm, 39 a. 1 r. 19 p., f. 950
Fritwell, Oxon.—The King's Head Inn, f., r. 21*l.* 900
Piddington, &c., Oxon.—Cluehill Farm, 115 a. 3 r. 15 p., f. 1,000
Wheatley, Oxon.—Bullsdown Barn and 20 a. 3 r. 16 p., f. 600
Kidlington, Oxon.—Freehold cottage and 7 a. 0 r. 17 p. 400

By WARNER, SHEPPARD & WADE (at Leicester).

Glenfield, Leicester.—The Manor House Farm, 178 a. 3 r. 35 p., f. 7,160
Five freehold cottages 200
New Parks, Leicester.—A freehold farm, 92 a. 2 r. 25 p. 4,631
Thurmby, Leicester.—The Manor House and 11 a. 3 r. 24 p., f. 1,920

By DICKINSON & RIGGALL (at Louth).

Donington-on-Bain, Lincs.—Freehold farmhouse and 78½ acres 1,860
Legbourne, Lincs.—Freehold house, two cottages and 12 a. 3 r. 15 p. 1,210
A freehold close, 1 a. 3 r. 14 p. 164
November 14.—By CHESTERTON & SONS.
Kensington.—2, Palace Green, u.t. 41 yrs., g.r. 125*l.* 15,500

By I. FARLOW.

Norwood.—6, Alexandra-rd., u.t. 54 yrs., g.r. 9*l.*, r. 40*l.* 320

By H. J. BLISS & SONS.

Catford.—83, Nelgarde-rd., f., r. 32*l.* 410
Hammersmith.—7, Burfield-st., u.t. 67½ yrs., g.r. 7*l.*, r. 32*l.* 230
Limehouse.—81, Northey-st., f. 195
77 and 79, Northey-st., u.t. 53 yrs., g.r. 3*l.* 10s. 260

By CHAMBERS & GIET.

Kennington.—28 and 30, St. Agnes-pl., u.t. 77½ yrs., g.r. 18*l.*, r. 102*l.* 1,210
Brixton.—178, Leander-rd., u.t. 74½ yrs., g.r. 5*l.*, r. 34*l.* 375

By NORRIS, SON, & HADLEY.

Chelsea.—514, King's-rd., u.t. 53½ yrs., g.r. 1*l.*, e.r. 50*l.* 690

By STIMSON & SONS.

Peckham.—143, Lower Park-rd., f. 430
39, Clifton-rd., u.t. 44½ yrs., g.r. 9*l.* 10s. 6d., e.r. 50*l.* 450
15, Clifton-rd., u.t. 44½ yrs., g.r. 5*l.* 5s. 9d., r. 28*l.* 265
16, Culmore-rd., u.t. 44½ yrs., g.r. 5*l.* 1s. 11d., r. 34*l.* 350
Old Kent-rd.—42 and 42A, Blockhouse-st., u.t. 59½ yrs., g.r. 4*l.* 10s. 300
Dulwich.—52, 54, 56, and 58, Crawthew-grove, u.t. 77½ yrs., g.r. 20*l.* 980
119 and 121, Crystal Palace-rd., u.t. 64 yrs., g.r. 12*l.* 12s., r. 60*l.* 540
36 and 38, Lacon-rd., u.t. 76 yrs., g.r. 10*l.* 550
Kennington.—78 to 83, St. Paul's-rd., u.t. 46 yrs., g.r. 28*l.* 8s. 1,500
2, 3, 4, and 6, Aldred-rd., u.t. 20½ yrs., g.r. 20*l.* 560
Walworth.—2, Frederick-rd., u.t. 24 yrs., g.r. 5*l.*, r. 28*l.* 180
88, Olney-st., u.t. 14 yrs., g.r. 3*l.* 10s., r. 28*l.* .. 140
Tooting.—14 to 20 (even), Tintern-st., u.t. 73½ yrs., g.r. 25*l.* 10s., r. 128*l.* 1,160
1 to 7, Mandrake-rd., u.t. 83½ yrs., g.r. 22*l.* 10s. 1,555
New Cross.—12 to 18 (even), Reaston-st., u.t. 74 yrs., g.r. 20*l.* 1,140
Sydenham.—64 to 78 (even), Miall-rd., u.t. 79 yrs., g.r. 40*l.* 960
Richmond, Surrey.—5, Sheen-pk., u.t. 75¼ yrs., g.r. 10*l.* 10s., r. 44*l.* 355
Bow.—64, 66 and 68, Devons-rd., u.t. 75¼ yrs., g.r. 22*l.* 15s., r. 107*l.* 1,035

November 15.—By JONES, LANG, & CO.

Finsbury Park.—31, Woodstock-rd., u.t. 65½ yrs., g.r. 6*l.* 10s., r. 36*l.* £385

By NORTON, TRIST, & GILBERT.

Notting Hill.—2, Queen Anne's-ter., u.t. 77 yrs., g.r. 7*l.* 10s., e.r. 70*l.* 320
Tilbury, Essex.—Dock-rd., a plot of freehold building land 150

By SINCLAIR & SON.

Hoxton.—49 and 51, Fairbank-st., u.t. 46 yrs., g.r. 6*l.* 10s., r. 90*l.* 1,065
Fulham.—1 to 4, Avalon-rd., u.t. 57½ yrs., g.r. 13*l.* 860
Wimbledon.—93, Kingston-rd., u.t. 57 yrs., g.r. 5*l.*, r. 30*l.* 370

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 12 0	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 10 0	" "
Facing Stocks	2 12 0	" "
Shippers	2 8 0	" "
Flettons	1 8 0	" at railway depôt.
Red Wire Cuts	1 13 0	" "
Best Fareham Red	3 11 0	" "
Best Red pressed Ruabon Facing.	5 5 0	" "
Best Blue Pressed Staffordshire	4 6 6	" "
Do., Bullnose	4 10 0	" "
Best Stourbridge Fire Bricks	4 4 0	" "
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers	13 0 0	" "
Headers	12 0 0	" "
Quoins, Bullnose, and Flats	17 0 0	" "
Double Stretchers	19 0 0	" "
Double Headers	16 0 0	" "
One Side and two Ends	19 0 0	" "
Two Sides and one End	20 0 0	" "
Splays, Chamfered, Squints	20 0 0	" "
Best Dipped Salt Glazed Stretchers and Headers	12 0	" "
Quoins, Bullnose, and Flats	14 0 0	" "
Double Stretchers	15 0 0	" "
Double Headers	14 0 0	" "
One Side and two Ends	15 0 0	" "
Two Sides and one End	15 0 0	" "
Splays, Chamfered, Squints	14 0 0	" "
Seconds Quality White and Dipped		
Salt Glazed	2 0 0	" less than best.

	£ s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime	25 6	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s 6d.	per yard, delivered
Stourbridge Fire-clay in sacks, 28s. od.		per ton at rly. dpt

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath "	1 7	" "
Farleigh Down Bath	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Red Mansfield "	2 4	" "
Hard York in blocks	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt
" " 6 in. Rubbed Ditto	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" 3 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt
" " " 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3-in. do.	1 2½	" "

SLATES.

In. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.
" best seconds "	10 15 0	" "
16×8 best "	6 2 6	" "
20×10 best blue Portmadoc	10 18 0	" "
16×8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green	11 2 6	" "
16×8 " "	6 15 0	" "
22×12 Permanent green	10 0 0	" "
16×8 " "	5 12 6	" "

PRICES CURRENT (*Continued*).

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	48 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. ornamental Do.	60 0	" "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.
¾ in.	1 0 0	"
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (30 ft.)	3 0 0	3 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
" " 3 in. by 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0
Petersburg: First yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " " 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 10 0	13 10 0
" " " 3 in. by 9 in.	12 0 0	12 10 0
" " battens	9 10 0	10 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders "	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Flitch Plates	8 10 0	9 0 0
Cast Iron Columns and Stancl ions, including ordinary patterns	7 0 0	8 0 0

[See also page 475.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
Hospital	Burslem Corporation	100*l.* and 50*l.*	Dec. 20
Art Schools	Hull Corporation	100*l.*, 60*l.*, 40*l.*	Jan. 31

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Street Works	Walthamstow U.D.C.	G. W. Holmes, Civil Engineer, Town Hall, Walthamstow	Nov. 26
Additions to Business Premises	Newbottle (Durham) Co-op. Soc.	Secretary, Co-operative Society's Offices, Newbottle	do.
Iron Rails, &c., Fairfield	Cockermouth U.D.C.	J. Fearon, Council Offices, Cockermouth	do.
Additions to Marine House, Bridlington	Dr. Wetwan	S. Dyer, Architect, Bridlington	do.
Additions to Netherfield Works, Kendal		R. Walker, Architect, Windermere	do.
Additions to Church, Garndiffaith, Pontypool		Swash & Bain, Architects, Newport, Mon.	do.
*Road-making and Paving Works	Willesden District Council	Engineer to Council, Public Offices, Dyne-road, Kilburn, N.W.	do.
*Making-up Roads	Barnet U.D.C.	Surveyor, 40, High-street, Barnet	Nov. 27
Additions to Police Station, Mountain Ash	Glamorgan County Council	T. M. Franklen, Westgate-street, Cardiff	do.
Warehouse, Liverpool	L. & Y. Railway Company	H. Shelmerdine, Hunt's Banks, Manchester	do.
Additions to Schools, Braithwell, near Rotherham		E. T. Hubbard, Architect, Moorgate-street, Rotherham	do.
Sewerage Works, Partick	Glasgow Corporation	City Engineer, City Chambers, Glasgow	do.
Tram Rails, &c.	Lancaster Corporation	W. A. Tester, Engineer, Town Hall, Lancaster	do.
Bricks, Clay, &c.	Burton-upon-Trent Corporation	F. L. Ramsden, Engineer, Gas Works, Burton-on-Trent	do.
Bridge, Cat Hill	East Barnet Valley U.D.C.	H. York, Surveyor, Station-road, New Barnet	Nov. 28
Boundary Wall, Dunbell	Kilkenny R.D.C.	K. Comerford, Council Offices, Kilkenny	do.
Houses, Upper Rathmines	Rathmines & Rathgar U.D.C.	F. G. Hicks, Architect, 28, South Frederick-street, Rathmines	do.
Shelter, &c., West Cliff	Ramsgate Corporation	Borough Surveyor, Town Hall, Ramsgate	do.
Stables, &c., Winter-street Hospital	Sheffield Corporation	C. F. Wike, Civil Engineer, Town Hall, Sheffield	do.
14 Cottages, Nelson-street, Consett	Iron Company Limited	C. E. Oliver, Architect, Consett	do.
Water Supply Works, Ogden Valley	Nelson (Lancs) Corporation	J. Newton & Co., Engineers, 17, Cooper-street, Manchester	do.
Reservoir, Barr Wood, St. Ninian's, Stirlingshire		Crouch & Hogg, 53, Bothwell-street, Glasgow	do.
Additions to Cottage Hospital	Wanstead U.D.C.	C. H. Bressey, Surveyor, Council Offices, Wanstead	do.
Entrance Gates, &c.	Moss Side U.D.C.	H. B. Longley, Engineer, Moss Side, Lancs	do.
Additions to Bakehouse, Queen's-road	Halifax Industrial Society	M. Hall, Architect, 29, Northgate, Halifax	Nov. 29
Cottage, Aylstone Hill, Hereford		Nicholson & Hartree, Architects, Halifax	do.
Road, Lydiate-road, Heswall	Wirral R.D.C.	T. Davies, Surveyor, Eastham	do.
*New Coastguard Buildings, Northumberland	Admiralty	District Clerk of Works, 21, Bootham-terrace, York	do.
Fencing, Gates, &c., at Market	Carlisle Corporation	H. C. Marks, Civil Engineer, 36, Fisher-street, Carlisle	Nov. 30
13 Houses and Shops	Trelewis (Wales) Building Club	T. Roderick, Architect, Clifton-street, Aberdare	do.
Drainage Works at Workhouse	Williton (Somerset) Guardians	T. H. Andrew, Surveyor, Williton	do.
Four Houses, Pandy Estate, Aberkenfig	Mr. E. J. Pugh	E. J. Pugh, Prince of Wales Hotel, Aberkenfig	do.
Schools, Main-street	Egremont (Cumberland) Sch. Bd	J. S. Moffatt, Architect, 53, Church-street, Whitehaven	do.
School, Haugh Shaw	Halifax School Board	C. F. L. Horsfall & Son, Architects, Lord-st. Chambers, Halifax	do.
Additions to Premises, Baxtergate	Whitby Co-operative Society	J. J. Milligan, Architect, Whitby	do.
House, Windermere	Mr. J. Mudd	R. Walker, Architect, Windermere	do.
School, Illogan, Churchtown	Illogan School Board	S. Hill, Architect, Green-lane, Redruth	do.
Club Premises and Hall, Ripponden, near Halifax		W. C. Williams, Architects, 29, Southgate, Halifax	do.
*Supply of Articles (Waterworks Department.)	Margate Council	F. Stanley, Waterworks Office, Margate	Dec. 2
Schools, Lower Garndiffaith, Pontypool	Trevethin School Board	Lansdowne & Griggs, Architects, Newport, Mon.	do.
Alterations at Workhouse	Aylsham (Norfolk) Guardians	J. B. Pearce, Architects, 15, Upper Hing-street, Norwich	do.
Inn, Ballywater, Co. Down	The Right Hon. Baron Dunleath	W. J. Fennell, Architect, 2, Wellington-place, Belfast	do.
Hospital, Duke-street	Glasgow Parish Council	J. Baxter, 243, Vincent-square, Glasgow	do.
Nineteen Cottages, Quaker's Yard, Glam	Windsor Building Club	W. Dowdeswell, Architect, John-street, Treharris	do.
*Lighthouse, Fog Signal House, &c., Dungeness	Trinity House Corporation	Trinity House, E.C.	do.
*Stores Contracts	Great Northern Railway Company	Stores Superintendent, Doncaster	Dec. 3
*Alterations, &c., to Laundry	Poplar, &c., Sick Asylum District	J. & S. F. Clarkson, Architects, 136, High-street, Poplar, E.	do.
Road Works, Whitley	Whitley and Monkseaton U.D.C.	J. P. Spencer, Civil Engineer, 30, Howard-street, North Shields	do.
*Extension of Electric Lighting Works	Leyton U.D.C.	W. Dawson, Town Hall, Leyton	do.
*Paving Works	Hove Corporation	Borough Surveyor, Town Hall, Hove	Dec. 4
*Extensions to Polytechnic	Croydon Council	Borough Engineer, Town Hall, Croydon	Dec. 6
*Heating and Ventilating Works	do.	do.	do.
*New County Court, Middlesbrough	Commissioners of H.M. Works, &c	The Registrar, County Court, Middlesbrough	Dec. 9
*Enlargement of Town Hall	Wolverhampton Council	F. T. Beck, Architect, Wulfrun Chambers, Wolverhampton	do.
*Electric Light Station	Erith U.D.C.	W. Egerton, 12, Queen's-road, Erith	do.
*Additions to Polytechnic, Bedford Park	Middlesex County Council	H. T. Wakelam, Architect, Guildhall, Westminster, S.W.	do.
*Maisonette Houses, Wandsworth		F. & W. Stocker, 90, Queen-street, Cheapside, E.C.	Dec. 10
*Superstructure of Three Blocks of Artisans' Dwellings	London County Council	Architect's Department, Housing Branch, 18, Pall Mall East, S.W.	do.
Water Supply Works at Workhouse	Bethnal Green, London, Guardians	G. H. Hughes, Engineer, 97, Queen Victoria-street, E.C.	do.
Laying Mains, Station-rd. to Prenton Hill, Birkenhead	West Cheshire Water Company	W. M. Jones, 9, Hamilton-square, Birkenhead	Dec. 11
*Additions, &c., to Infirmary, Winchfield	Hartley Wintney Union	H. T. Sugden, Architect, Enersley, Winchfield	Dec. 13
Sewage Disposal Works	Wantage (Berks) U.D.C.	E. B. Ormond, Council Offices, Wantage	Dec. 14
*Isolation Hospital	Sevenoaks U.D.C.	W. H. Ansell, Architect, 11, Great James-street, W.C.	Dec. 16
*New School	Watford School Board	J. Hunt, Architect, 40, Upper Baker-street, N.W.	No date
*Erection of House, Broadstairs	The Proprietor	W. H. Woodroffe, Architect, 32, High-street, Southwark, S.E.	do.
Footpath, Hurstbourne Tarrant, near Andover		J. Wormald, South Cottage, Andover	do.
Rebuilding The Garden Gate Inn, Hunslet	Mr. E. Wilson	W. M. Coggill, Architect, Beech Grove, Stourton	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Examiner in H.M. Office of Works, &c.		Not stated	Nov. 28
*Depot Superintendant and Storekeeper	Walthamstow U.D.C.	2*l.* 10*s.* per week	do.
*Drainage Assistant	Woolwich Council	2*l.* 2*s.* per week	Nov. 29
*Accounts Clerk	do.	110*l.*	do.
*Clerk of Works	Edmonton School Board	3*l.* 13*s.* 6*d.* per week	Dec. 3
*Main Road Surveyor	Lancashire County Council	200*l.*, &c.	Dec. 7
*Clerk of Works	Edmonton U.D.C.	Four to Five Guineas per week	No date
*Mason, Northern Nigeria	Public Works Department	250*l.*	do.
*Engineering and Architectural Draughtsmen	H.M. Dockyard, Pembroke Dock	2*l.* 14*s.* per week each	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. x. & xix. *Public Appointments, pp.* xvi. xvii. & xix.

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PRICES CURRENT (*Continued*)

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
" " galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe	17 0 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin "	0 1 2	- - -
Copper nails "	0 1 2	- - -
BRASS—		
Strong Sheet "	0 0 11	- - -
Thin "	0 1 1	- - -
TIN—English Ingots "	0 1 3½	- - -
SOLDER—Plumbers' "	0 0 6½	- - -
Tinmen's "	0 0 8	- - -
Blowpipe "	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
" " fourths	3¼d. " "
21 oz. thirds	3¾d. " "
" " fourths	3¾d. " "
26 oz. thirds	4¾d. " "
" " fourths	4¾d. " "
32 oz. thirds	5¾d. " "
" " fourths	5¾d. " "
Fluted sheet, 15 oz.	3¾d. " "
" " 21 oz.	4¾d. " "
½ Hartley's Rolled Plate	2¾d. " "
⅝ " " "	3¾d. " "
¾ " " "	3¾d. " "

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 11
" " " in barrels "	0 3 0
" " " in drums "	0 3 2
Boiled " " in pipes "	0 3 1
" " " in barrels "	0 3 2
" " " in drums "	0 3 4
Turpentine, in barrels "	0 2 3
" in drums "	0 2 6
Genuine Ground English White Lead per ton	21 10 0
Red Lead, Dry "	22 0 0
Best Linseed Oil Putty per cwt.	0 9 0
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	per gallon. £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 18 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 18 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

M. & C.—F. S. Y.—J. S. & Son (Amounts should have been stated). J. R. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BECKENHAM.—For the erection of two firemen's cottages, &c., Shortlands, for the Urban District Council. Mr. J. A. Angell, Surveyor, Council Offices, Beckenham :—

General Builders, Ltd.	£2,176 0 0	Barden & Head	£1,490 0 0
H. Chapman	1,768 0 0	A. P. Poingdestre	1,432 0 6
Thomas & Edge	1,699 0 0	E. Orphin	1,326 10 0
Foster Bros.	1,567 0 0	H. Heathfield	1,316 0 0
W. Wallis	1,521 0 0		

CARLISLE.—For the construction of underground lavatories, Market-place, for the Corporation. Mr. H. C. Marks, C.E., 36, Fisher-street, Carlisle. Quantities by engineer :—

J. & R. Bell	£1,375 10 0	Beaty Bros.	£1,360 0 0
Baty & Sons	1,375 0 0	John Laing, Milbourne-st.*	1,338 0 0
James Beaty	1,373 19 7		

[Engineer's estimate, £1,350]

DOVER.—For the erection of a public-house and premises in the Elms-road, for Messrs. Thompson & Son, Ltd. Messrs. Edward W. Fry & Miller, architects, Cannon-street, Dover :—

Hayward & Paramor	£1,690	Warren & Son	£1,548
Goldsmith & Tapley	1,670	J. Parsons	1,537
Lewis & Sons	1,635	Austin & Lewis*	1,498
W. Bromley	1,556	[All of Dover.]	

DOVER.—For widening Folkestone-road, &c., for the Town Council. Mr. H. E. Stilgoe, C.E., Town Hall, Dover. Quantities by the Borough Engineer :—

G. Munro	£1,519 2 0	D. & G. Keeler, Dover	£1,314 4 0
G. Grigg	1,470 18 4		
Austin & Lewis	1,455 6 0		

EASTBOURNE.—For the construction of public conveniences, &c., Grand Parade, for the Corporation. Mr. R. M. Gloyne, C.E., Town Hall, Eastbourne :—

J. C. Lacey, Kilkenny, Willingdon-road, Eastbourne* £3,150

ELLASTONE (Staffs).—For filter-beds, &c., for sewage disposal works, for the Mayfield Rural District Council. Mr. John Twemlow, surveyor, Mayfield Grange, Ashbourn. Quantities by surveyor :—

Birch & Sons	£171	William Salt, Ellastone*	£150
William Thorley	155		

[Surveyor's estimate, £145 8 3.]

FARNBOROUGH.—For the supply of Pennant stone kerbs and channelling and laying same, for the Urban District Council. Mr. J. E. Hargreaves, Surveyor, Town Hall, Farnborough :—

Bentham & Co.	£504	W. H. Wheeler	£375
S. T. Clothier	448	Free & Co.	316
Wm. Norris	433	Free Bros., Marlboro'*	315
Payne & Co.	397		

HARROGATE.—For the execution of street works, Grange-avenue, &c., for the Corporation :—

Grange-avenue.

J. Dunn, 15, Beresford-terrace, Harrogate £452 19 11

Unity-grove.

Brooks & Son, 31, Grange-avenue, Harrogate 580 0 0

Back South Side of Unity-grove.

J. Buckley, 29, Wedderburn-road, Harrogate 214 15 4

Back North Side of Unity-grove.

Dickinson & Long, Starbeck 310 19 11

HARROGATE.—For the erection of steam laundry, Starbeck, for the Corporation. Mr. F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate :—

Mason.—A. Brown, Harrogate*	£1,650 3 10
Joiner.—G. H. Carrick, Harrogate*	320 0 0
Plumber.—J. M. Pratt, Harrogate*	227 10 0
Ironwork.—Abbott & Co., Gateshead-on-Tyne*	540 10 5
Painter.—J. W. Gill, Harrogate*	35 4 10
Plasterer.—M. M. Bartholomew Scotton, Knaresbrough*	10 19 4½
Slaters.—W. H. & E. Walton, Bingley*	120 0 0

HATFIELD PEVEREL.—For the erection of an addition to Gardners, Hatfield Peverel, Essex, for Mr. A. Rosling. Mr. C. E. Salmon, architect, Bell-street, Reigate, Surrey :—

J. Smith & Son	£325	Frank Johnson, Chelmsford*	£305
Ernest West	321	F. W. Owers	280

HEMEL HEMPSTEAD.—For kerbing, paving, &c. at Hemel Hempstead :—

Stiff's Concrete Co.	£480 10 7	A. T. Cattley	£443 7 9
Dupont & Co.	480 2 8	James Barry	392 1 2
H. Williams	456 8 10	H. Brown, Watford*	391 0 0

HODDESDON.—For kerbing, paving, &c., at Hoddesdon :—

Wallace & Inns	£1,043 13 0	Kitteringham	£788 18 4
Dupont & Co.	896 0 8	Nowell & Co.	782 5 0
George Mann	883 6 0	Griffiths & Co.	778 9 2
Free & Sons	862 13 4	W. & C. French	773 19 2
T. Adams	816 17 4	Victoria Stone Co., London*	759 6 1
Empire Stone Co.	800 13 4		

HOVE (Sussex).—For the execution of road works, Caburn road. Mr. H. H. Scott, Borough Surveyor, Town Hall, Hove :—

Parsons & Sons, 118, Church-road, Hove* £293

HOYLAND.—For various works for the Hoyland Nether School Board. Mr. W. J. Sykes, architect, Hoyland Nether, Yorks :—

Additional Classrooms at the Boys' Schools, Hoyland Common.

Masonry, &c.—Mark A. Hague, Hoyland, near Barnsley	£488 15 0
Joinery, &c.—Geo. Cook, Hoyland Common, near Barnsley*	350 0 0
Slating.—M. Fleming, Eastgate, Barnsley*	83 0 0
Plastering.—M. Fleming, Eastgate, Barnsley.	34 15 0
Plumbing, Glazing, and Painting.—Firth & Sons, Hoyland, near Barnsley*	112 0 0
Heating Apparatus.—Newton, Chambers, & Co., Thorncliffe Ironworks, Sheffield	26 0 0
	£1,094 10 0

Caretaker's House, Boys' School, Hoyland Common.

Masonry, &c.—Mark A. Hague, Hoyland, near Barnsley*	£183 10 0
Joinery.—Haydn Brearley, Hoyland Common, near Barnsley*	59 10 0
Slating.—M. Fleming, Eastgate, Barnsley*	21 12 6
Plastering.—M. Fleming, Eastgate, Barnsley*	14 15 0
Plumbing, Painting, and Glazing.—Firth & Sons, Hoyland, near Barnsley*	30 10 0
	£309 17 6

Caretaker's House, Girls' School, Hoyland Common.

Masonry, &c.—Saml. Hawke, Hoyland Common, near Barnsley*	£202 10 0
Joinery.—Haydn Brearley, Hoyland Common, near Barnsley*	61 12 6
Slating.—M. Fleming, Eastgate, Barnsley*	21 17 0
Plastering.—Jas. McPartlain, Hoyland, near Barnsley*	14 10 0
Plumbing, Glazing, and Painting.—W. H. Rawlin, Hoyland, near Barnsley*	33 19 0
	£334 8 6

Caretaker's House at Hoyland Nether.

Masonry, &c.—Saml. Hawke, Hoyland Common, near Barnsley*	£170 0 0
Joinery.—N. Mell, Hoyland Nether, near Barnsley*	64 18 0
Slating.—M. Fleming, Eastgate, Barnsley*	19 12 6
Plastering.—Jas. McPartlain, Hoyland Nether, near Barnsley*	14 10 0
Plumbing, Glazing, and Painting.—W. H. Rawlin, Hoyland Nether, near Barnsley*	31 19 0
	£300 19 6

Asphalting Playgrounds, New Conveniences, Porch, &c., at the Girls' School, Hoyland Common.

Masonry.—Mark A. Hague, Hoyland, near Barnsley*	£235 10 0
Joinery.—H. Brearley, Hoyland Common, near Barnsley*	25 15 7
Plumbing, Glazing, and Painting.—W. H. Rawlin, Hoyland, near Barnsley*	10 19 0
	£272 4 7

Teachers' Residence, Hoyland Common—Alterations in position of fireplaces, walling-up windows, &c.

Builder.—H. Hemingway, Hoyland Common, near Barnsley* £22 0

HOYLAND.—For erecting a Primitive Methodist chapel and schools, &c., at Hoyland Common. Mr. W. J. Sykes architect, Hoyland Nether :—

Masonry, &c.—Mark A. Hague, Hoyland, near Barnsley*	£1,080 0 0
Joinery.—Geo. Cook, Hoyland Common	730 0 0
Slating.—Wm. Cooper, Wentworth, near Rotherham*	157 0 0
Plastering.—M. Fleming, Eastgate, Barnsley*	100 0 0
Plumbing, Painting, and Glazing.—C. Firth & Sons, Hoyland, near Barnsley*	150 0 0
Heating.—Newton, Chambers, & Co., Thorncliffe, near Sheffield*	97 0 0
	£2,314 0 0

HOYLAND.—For erecting two houses in Allott-street, Hoyland Common, for Messrs. H. & C. Allott. Mr. W. J. Sykes, architect, Hoyland Nether :—

Masonry, &c.—A. Hemingway, Hoyland Common, near Barnsley*	£173 0 0
Joinery.—H. Brearley, Hoyland Common, near Barnsley*	83 0 0
Slating.—M. Fleming, Eastgate, Barnsley*	22 5 0
Plastering.—Jas. McPartlain, Hoyland, near Barnsley*	24 10 0
Plumbing, Glazing, and Painting.—H. W. Rawlin, Hoyland, near Barnsley*	18 0 0
	£320 15 0

[*See also next page.*

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HOYLAND.—Two houses in Tinker-lane, Hoyland Common, for Messrs. Hutchinson & Turner. Mr. W. J. Sykes, architect, Hoyland Nether :—
Thos. Thawley, Blacker Grange, near Barnsley* £520

HOYLAND.—For one house in Queen-street, Hoyland Common, for Mrs. Geo. Hague. Mr. W. J. Sykes, architect, Hoyland Nether :—
Mark A. Hague, Hoyland, near Barnsley* ..£135 10

LONDON.—For new Presbyterian church, Muswell Hill. N. Messrs. Geo. Baines and Reginald P. Baines, architects, 5, Clement's-inn, Strand, London :—

Lascelles & Co.	£7,820	Battley, Sons, & Holness	£7,048
Higgs & Hill	7,562	Thompson & Beveridge	6,979
H. F. & H. Higgs	7,560	Turtle & Appleton	6,971
Matlock Bros.	7,267	T. G. Minter	6,887
W. J. Maddison	7,261	Johnson & Co., Ltd.*	6,251
Chessum & Son	7,244	J. O. Richardson (withdrawn)	6,122
Holliday & Greenwood	7,222		

LONDON.—For erecting new offices, &c., No. 246, Rotherhithe-street, S.E., for Messrs. Bellamy's Wharf, Ltd. Mr. John Jas. Downes, architect, 199, Lewisham High-road, New Cross, S.E. :—

Chalkley	£2,600	S. R. Best	£2,147
Jerrard & Sons	2,184	T. D. Leng	2,118

LONDON.—For the erection of offices and shops, Brixton Hill, S.W., for Mr. W. H. Daw. Messrs. Dale & Gadsdon, architects, 8, Union-court, Old Broad-street, E.C. Quantities by Mr. W. James Pamphilon, 21, Finsbury Pavement, E.C. :—

Kemp	£5,050 0	Sharpe	£4,250 10
Hoare	4,983 0	Irwin	4,250 0
Peacock Bros.	4,560 0	Staines & Son*	4,248 0
Candler & Son	4,294 10		

LONDON.—For making up, &c., Margravine and other roads, for the Fulham Borough Council. Mr. C. Botterill, C.E., Town Hall, Fulham :—

Roome & Co.	£7,500 0	Martin, Wells, & Co.	£6,440 0
Barker & Co.	6,998 0	Stimpson & Co.	6,380 0
Smith & Sons	6,997 0	H. L. Holloway	6,256 0
Spencer, Santo, & Co.	6,696 0	Foster Bros.	6,196 0
R. E. Nightingale	6,635 0	Lole & Lightfoot	5,984 5
T. Bendon	6,587 0	F. G. Minter	5,891 0

LONDON.—For making-up Harold-road, for the Tottenham Urban District Council. Mr. W. H. Prescott, M.Inst.C.E., 712, High-road, Tottenham :—
C. Bloomfield, Tottenham* £432 16 8

PEMBROKE.—For the erection of a new workhouse infirmary. Mr. E. H. Lingen Barker, architect, Hereford :—

Brown, Thomas & John	£4,124 5 0	Davis & Morgan	£3,573 0 0
Davies & Griffiths	3,702 3 9	David Davies	3,378 0 0
Lewis & Co.	3,645 0 0	Thomas, Watkins, & Co.	3,378 0 0

PAIGNTON.—For alterations and additions to Primley House, for Mr. H. C. Belfield. Messrs. Bridgman & Bridgman, architects, Torquay and Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton :—

General Constructive Works.

R. Harris	£2,689	W. Lethbridge	£2,639
G. Webber	2,664	Webber & Sons	2,615
E. Westlake	2,652	Dart & Pollard*	2,602
C. & R. E. Drew	2,648		

Internal Plumber's Work.

C. Bootyman* £209 18

Decorations.

Webber & Sons	£195 0	C. & R. E. Drew	£188 10
Thomas & Jennings*	188 15	Thomas & Son	184 0

ROCHFORD.—For women's new wards, administration block, covered ways, and alterations to existing infirmary at the Rochford Union, Essex, for the Rochford Board of Guardians. Messrs. Greenhalgh & Brockbank, architects, Southend. Quantities by Mr. G. T. G. Wright, 3, Great Winchester-street, London, E.C. :—

Moss	£8,888	Shelbourne	£6,389
J. Band	7,500	Potter	6,318
Turner & Co.	6,995	Harris & Rowe	6,270
Coulson & Loftus	6,776	Davis & Leaney	6,195
F. & E. Davey	6,546	Dupont	6,097
Howard & Ruffle	6,538	W. E. Davey	6,079
McKay	6,470	E. West, Chelmsford*	6,078

ST. ALBANS (Herts.).—For cottage residence, Blenheim-road, St. Albans. Mr. S. Doddimeade Edmunds, architect, St. Albans and London :—

E. Dunham	£809 0	W. Sharp	£564 0
Vail & Co.	648 0	Goodchild & Sons	560 0
W. Sparrow	589 10		

[All of St. Albans].

TOTNES (Devon).—For the erection of a cottage, Redworth, for Mr. M. F. Stapylton. Mr. W. F. Tollit, architect, High-street, Totnes :—

T. Brook	£296	Tozer & Son	£247
Reeves & Sons	287	Henry Albert	203
H. J. Almond	250	R. E. Narracott, Stoke	
Leaman & Kinsman	248	Gabriel, Totnes*	197

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The Builder.

VOL. LXXXI.—No. 3069. NOVEMBER 30, 1901.

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Congregational Church and Schools, Woodhouse-lane, Leeds ..... Mr. G. F. Danby, Architect.
Residences near London ..... Mr. Francis Hooper, Architect.
Catesby House Stables, near Hellidon, Northants ..... Messrs. Archer & Hooper, Architects.
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Model By-laws for Rural Districts.

EARLY a generation after the passing of the Public Health Act (1875) the Local Government Board has awakened to the fact that there is a radical difference between Urban and Rural districts, and that by-laws which may be reasonably enforced in towns will be unduly onerous in the country. Rural District Councils have been aware of this, and with comparatively few exceptions have done without by-laws altogether rather than adopt the stringent clauses which the Local Government Board has hitherto considered necessary. In the recently-issued "Model by-laws as to new buildings and certain matters in connexion with buildings in rural districts," the Board shows a spirit of compromise which can scarcely fail to gain the sympathy of Rural Authorities.

The new model by-laws are "confined to matters affecting health," and do not, indeed, deal with matters of this kind in a harsh or exhaustive manner. They contain no clauses as to the stability of buildings, the prevention of fire, and the level, width, and construction of new streets, and do not even specify the height of rooms which are to be used for human habitation. In the main, the new series consists of a selection of clauses from the old model by-laws, but some idea of the simplification which has been effected will be gathered from the fact that the number of by-laws in the new series is only fifty-one, while in the old or urban series it is exactly 100.

By-law No. 1 contains interpretations of various terms such as "public building," "domestic building," &c., and, as far as it goes, is similar to the corresponding urban by-law.

No. 2 specifies the buildings which shall be exempt from the operation of the by-laws, and contains nine clauses, eight of which tally with the urban exemptions. Three clauses of the urban by-law are, however, omitted, and a new clause is inserted which has the effect of excluding from the operation of the by-laws all buildings which are not public buildings, or buildings of the warehouse class, or dwelling-houses. Thus, to quote the words of the official memorandum accompanying the by-laws, "the erection of buildings for agricultural purposes, and out-buildings such as a plant house, orchard house, summer house, poultry house, tool house, &c., is wholly unrestricted, except that they should not encroach on the open space required to be provided for new domestic buildings." Pigsties and cowsheds, however, are not exempt unless they are detached from a dwelling-house. Stables are not mentioned, but we gather from the wording of the clause and of the memorandum that they are exempt whether attached to a dwelling-house or not.

Only three by-laws are devoted to "the structure of walls and foundations." The first (No. 3) specifies that the site of a "new domestic building" must be covered with asphalt or concrete "wherever the dampness of the site or the nature of the soil renders such a precaution necessary." The sentence within inverted commas does not appear in the corresponding urban by-law. No. 4 requires a damp-course to be laid beneath the level of the lowest *floor* (not "timbers," as in the older by-laws) in every wall of "a new *public* building *or a new dwelling-house*." The italicised words are new, and have the effect of excluding buildings of the warehouse class, the outbuildings of houses, &c., from the operation of the by-law. Two new clauses deal with the construction of walls of rooms below the level of the ground, and stipulate that such walls shall be impervious to moisture or double. If the latter method is adopted, there must be a cavity 2½ in. wide between the two parts of the wall and extending from the base to a height of 6 in. above the ground; the two parts must be tied together with "suitable and sufficient ties" of iron, stoneware, &c., and must have damp-courses at the base and at the level of the top of the cavity. No. 5 completes the regulations as to the walls by specifying that parapets must be properly coped or otherwise protected to prevent dampness. Not a word is said as to the materials of which walls above ground must be built, and, consequently, wood, brick, stone, concrete, and other materials may be used; the thickness of the walls is also left to the discretion of the builder.

The clauses relating to the air-space in the front of buildings are much less onerous than the corresponding clauses of the old series. Between the fronts of *domestic buildings* on opposite sides of a street there must be a space at least 24 ft. wide; in the case of a building of this class "intended to front on a street laid out before the confirmation of these by-laws and of a less width than 24 ft.," the front of the building must be set back at least 12 ft. from the centre of the street. This is an equitable adjustment between the owners of the ground on opposite sides of the street. There is no obligation to increase the width of the roadway to 24 ft., but the space may be utilised as a garden or yard or for the erection of a portico, porch, step, &c., and may be enclosed by a gate, fence, or wall not more than 7 ft. high. The by-law relates only to *domestic buildings*; public buildings and buildings of the warehouse class do not fall within its scope.

The same remark applies to the next by-law (No. 7), which fixes the space in the rear of "a new domestic building" at not less than 150 square feet. The distance across this space "from every part of such building to the boundary of any lands or premises immediately opposite or adjoining the site of such building" must be in every part at least 15 ft.; but if the height of the building is 25 ft. the distance must be at least 20 ft.; and if the height is 35 ft. or more, the distance must be at least 25 ft. No building may be erected on this space except a water-closet, earth-closet or privy, and an

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ashpit. Many Urban Authorities which have adopted the older model by-laws (containing almost identical provisions) have found it necessary to allow a coal-place also to be erected on this space, and we think that this permission ought to be explicitly granted in the new by-laws. A still greater objection may be taken to the clause as it now stands. In provincial towns and villages back streets or passages are almost invariably found, and have the great advantage of facilitating drainage as well as the removal of ashes and the contents of earth-closets and privies. In such places the adoption of the older model by-laws has at once led to friction between architects or builders and the authorities. The space required in the rear of an ordinary two-storied cottage, and "exclusively belonging to such building," must be at least 15 ft. wide; the back street between the two open spaces must be 36 ft. wide; and we thus get a total width of 66 ft. between the backs of opposite rows of cottages. Obviously, this is excessive, and authorities have almost invariably had the mortification of having to break their by-laws as soon as adopted. Generally a total width of 36 ft. between the backs of buildings has been adopted as the minimum, and of this a portion from 12 ft. to 15 ft. wide has been allotted to the back street midway between the buildings. Some provision of this kind might with advantage have been inserted in the new by-laws.

The ventilation of buildings is dealt with in By-laws 8 to 12, which agree very closely with Nos. 55 to 59 of the old series. The only important alteration is that the clauses relating to the sizes and openings of windows are now confined to new *domestic* buildings, and not, as in No. 57 of the earlier by-laws, to new buildings generally. The area of the aperture or air-shaft provided for the ventilation of a habitable room without fireplace has also been reduced from 100 to 50 sq. in.

Nos. 13 to 18 are concerned with the drainage of buildings, and provide for sub-soil drainage "wherever necessary," and for the mode of construction and ventilation of drains. Drains are to be laid in a bed of concrete "where necessary" only; the depth of drains under buildings is not now specified, but adequate means of *access* must be provided at both ends of such drains, the word "access" being now substituted for "ventilation." An intercepting trap must be placed in every sewage drain near the point of connexion with the "sewer or other means of discharge," and the drain must be ventilated by means of two openings—one at or near the surface of the ground, and the other at least 10 ft. above the ground—except as follows:—1. No ventilation whatever is required for a drain not more than 20 ft. long if the drain does not serve a water-closet "within the building"; and 2, the opening for ventilation at or near the surface of the ground may be dispensed with if the drain is not more than 30 ft. long and does not serve a water-closet which has "internal communication with any building."

The waste-pipes from slop-sinks (No. 19) must be treated generally as soil-pipes, but the diameter of such waste-pipes is not specified. Soil-pipes may now be 3½ in. in diameter instead of 4 in. Waste-pipes from baths, kitchen-sinks, and lavatories must be trapped and must discharge over channels leading to trapped gullies, but the length of such channels is now not stated. This is an advantage.

The provisions with regard to water-closets, earth-closets, and privies have been altered and improved. Earth-closets are now classed with privies, and not with water-closets, and may not be placed within a building. Windows are not required in water-closets which are not "within a building," but a sufficient opening for "lighting and ventilation" must be provided in each case. By a new by-law, the occupier of any premises is made responsible for the supply of a sufficient quantity of water for flushing the closet in his occupation.

In the earlier by-laws it was specified that privies must be at least 6 ft. from any habitable building. This distance is now increased to 10 ft., and must be adhered to in the case of earth-closets as well as privies. Earth-closets and privies (see Nos. 25 to 32) must be constructed alike, and may have either fixed or movable receptacles for filth. According to By-law 29, both earth-closets and privies must be provided with "suitable means or apparatus for the frequent and effectual application of dry earth or other deodorising substance, or of ashes, dust, or dry refuse," to any filth deposited in the receptacles. From these by-laws it would appear that there is now no distinction recognised between earth-closets and privies; but the explanatory memorandum shows that what is meant by an earth-closet is a closet in which dry earth (not ashes or other refuse) is used to cover the deposits. There can be no doubt whatever that earth-closets are seldom kept in proper condition; tenants are, as a rule, too careless to provide a supply of dry earth, and the closets become merely privies. Where, however, a Rural District Council is prepared to undertake the supply of dry earth, or can show that facilities for obtaining it exist, by-laws dealing with earth-closets apart from privies (on the lines of the older model by-laws) will be sanctioned by the Local Government Board. The only other alteration to which attention need be drawn is the increase of the size of a *fixed* receptacle for filth from 8 to 12 cubic feet.

The by-laws relating to ashpits (Nos. 33 to 38) differ from the urban model in only two important respects. They must be at least 10 ft. from a habitable building (an increase of 4 ft.), and may have a capacity of 20 cubic feet instead of 6. The latter alteration is designed to allow the accumulation of a month's refuse instead of the week's accumulation allowed for in the urban by-laws. Cesspools (Nos. 39 to 42) are regulated as before, with the exception of alternative methods of construction being provided for. By-law 43, dealing with the closing of buildings unfit for human habitation, is similar in all respects to the Urban By-law No. 90, and the remaining by-laws, which treat of the deposit of plans and sections, the giving of notices, the inspection and reconstruction of work, penalties, &c., are merely altered to exclude the laying-out and construction of streets, and the materials used in the erection of buildings, from the operation of the by-laws.

It will be gathered from this summary that the Local Government Board has gone a long way towards meeting the objections of Rural Authorities to the older model by-laws. Indeed, in the matter of the space between the fronts of new domestic buildings, we think they have gone too far. A space only 24 ft. wide is too little, and the cost of building would be only very slightly increased if a width of 30 or 36 ft. were required. The additional space could be utilised for gardens, and, judging from the case of urban districts where the model by-laws have been adopted, we believe that the building owner would not have to pay a penny for the extra land, while the vendor would still be able to charge a price considerably in excess of its agricultural value.

That the erection of buildings in at least some parts of rural districts ought to be regulated, all sanitarians are agreed; and the new model by-laws are on the whole so reasonable, that many Rural District Councils which would have nothing to do with the old urban series will probably adopt them. It may be mentioned that by-laws may be made for a part of a rural district, but this part should be "very clearly defined by a well-recognised boundary-line." Of course, if a Council wishes to adopt more stringent by-laws for the whole or part of its district, there is nothing to prevent this being done; and as in many districts there are portions which are of a decidedly urban character, it will often be necessary to regulate the width of new streets and the materials to be used in the erection of buildings.

NOTES.

The City of London and Control of the Streets.

THE Corporation of the City of London will apply to Parliament in the course of next Session for leave to bring in a Bill that shall confer upon them new and further powers with respect to the breaking up of and interference with streets in the City of London and the Liberties. They seek also to obtain a more thorough control over the various persons—including the Postmaster-General—who have statutory or special powers of opening and breaking up the thoroughfares. The Bill will provide that not less than two months' notice, together with plans, sections, &c., shall be given before any work of that kind is begun; that a certain period shall elapse before such operations are renewed in the same street, and that the works shall be executed during such times of the day or night, or day and night, and in such order or sequence, as the Corporation may, under penalty, require. The Corporation desire further to make by-laws affecting the removal of house-refuse and its deposit by occupiers each morning in approved receptacles upon the pavement, and the demolition of buildings with its attendant dust, dirt, nuisance, and noise.

The Workmen's Compensation Act.

THE decision of the Court of Appeal in the case of Veazey *v.* Chattle puts a finishing touch to the criticism on this statute. The question raised was really one of fact, which a sensible layman was just as capable of deciding as a trained lawyer, namely, whether a crawling-board was a scaffold. The Court decided that it was, for the reason that it was assumed that the Legislature could not have intended to do anything so foolish as exclude a workman from compensation simply because a crawling-board was not in common parlance a scaffold. This board, said the Master of the Rolls, fulfilled the

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purpose of repair just as well as an actual scaffold. It was a kind of platform, and as the Court ought not to narrow down the statute more than was possible, the board should be regarded as scaffolding within the meaning of the Act. Whether this last decision will cause the Home Secretary to take in hand an amending Act we know not, but there can be no question that the recent course of decisions has shown more strongly than ever the urgent need of eliminating the unjust and tiresome exceptions in this Act, which are not only the cause of litigation, but often work the grossest injustice.

A Gas Testing Question.

THE South Metropolitan Gas Company do not like the existing methods employed by the gas examiners of the London County Council for testing the quality of the Company's gas, and have given notice that they intend to introduce a Bill during the next Session of Parliament, to, among other things, abolish the present system of testing in favour of the testing arrangements prescribed by the Gasworks Clauses Act, 1871. Under the present system the gas examiners may test the gas for illuminating power at any hour of the day or night, but under the Gasworks Clauses Act the tests may only be conducted between certain hours in the evening. In the Gasworks Clauses Act no provision is made for testing the quantities of ammonia and of sulphur compounds, other than sulphuretted hydrogen, present in the gas; but under the existing arrangements the quantities of these impurities are estimated every day. If the gas is always of good quality, why object to the testing? Even if the testing necessitates the expenditure of a few thousand pounds per annum, this sum is insignificant in comparison with the sum which might be saved by the company, at the expense of the consumers, by systematically supplying gas of lower quality than it ought to be. The testing of a commodity does not necessarily indicate suspicion of the honesty of the vendor; it is a common-sense business precaution. The existing system of testing is prescribed by three gas referees, who are impartial experts of high scientific reputation appointed by the Board of Trade, and are quite competent to perform the duties they have undertaken. We have consistently advocated the supply of a cheap low-grade gas in preference to a costly high-grade gas, but whatever the quality of the gas it must be rigorously tested, and the most suitable reply which the consumers of South London can make to the present proposition of the gas company is to agitate for the addition of a calorific power test and a carbon monoxide test to the present series of tests prescribed by law.

Electric Traction on Railways.

MR. LANGDON, in his presidential address to the Institution of Electrical Engineers last week, stated several of the problems which have to be solved before electricity can displace steam in railway working. As Mr. Langdon is an electrician who has had unrivalled experience in railway working owing to the many years he has been associated with the Midland Railway, his address deserves careful study. He is convinced that sooner or later electricity will displace steam. He recommends railway companies to attack the problem at once, and equip electrically a portion of their lines so as to find out experimentally the most suitable system. Failure to do this will probably lead to the construction of fast electric railways parallel to their lines with disastrous results. Although Manchester and Liverpool are connected by three lines of railway, yet the proposed electric line on a mono-rail system joining them has received Parliamentary sanction. The capital invested in electric railways is 1,300,000,000*l.*, and the wholesale depreciation of such a vast sum would be a national calamity. The total weight of a modern steam locomotive and tender exceeds a hundred tons, and the tendency of the day is to make them larger and heavier, so that the speed of passenger trains and the load on goods trains may be increased. This involves a greater stress on the permanent way, and the impact on bridges and other structures over which the vehicles pass is often excessive. Two electric locomotives, or, better still in our opinion, a train made up of carriages each containing its own motors, would distribute the weight better, and would be welcomed by the engineer of the line. The reason Mr. Langdon gave for his preference of the electric locomotive was that the locomotive system would be equally suited for both goods and passenger traffic. In railway working a great loss is occasioned by the shunting of heavy goods trains going at the rate of twenty miles an hour to let the express trains pass. If we shortened the goods trains and ran them by electric locomotives at forty miles an hour, we could double the capacity of the line. Mr. Langdon stated that an overhead electrical service was inadmissible on main lines. He was probably thinking of a railway equipped with direct current where the great weight of the conductors required would make the expense of putting them overhead prohibitive. With three-phase high-tension currents we think two light overhead trolley wires might be most advantageously employed.

Telephone Competition.

WHEN the Post Office proposed two years ago to start a telephone service in London, we welcomed the scheme, naturally thinking that the competition with the National Telephone Company would lower the rates and lead to a more efficient service. Two millions of the country's money has been sunk in the undertaking, and the Post Office was granted full powers to dig up the streets to lay their elaborate conduits. Considering that the National Telephone Company has to pay 10 per cent. of their gross receipts to the Government, and that it has to pay a dividend on a very inflated capital, it was not surprising that the public should have expected a substantial reduction of the rates. Apparently, however, the public derives no advantage at all from the new service. At present any one joining the Post Office system will have to wait longer at his telephone before he can get connected through to any of the company's subscribers than if he subscribed to the company. He will have to be connected to the company's exchange through the medium of the Post Office exchange, and he will gain nothing by this delay. It seems to us that it would have been far better for the nation to have purchased the National Telephone Company's undertaking on a reasonable valuation than turn the Post Office into a branch establishment of the company, managed by officials who until a few months ago were on the staff of the Company. We hope that the agitation against the unreasonable tariff of the Post Office will lead to a lowering of the rates. The inhabitants of London put up very patiently during the last two years with the obstruction to traffic caused by the laying of the elaborate P.O. conduits. It seems hardly equitable that they should have to pay nearly a hundred per cent. more than the inhabitants of Glasgow do for their municipal service. The failure of the Post Office to compete with the Company has grievously disappointed the business people of London.

Multiplex Telegraphy.

IT is known to electricians that when we have an alternating and a direct current flowing in a wire each produces its own heating effect just as if the other were not there. For example, the heating of a wire carrying a current of 10 ampères direct and 10 ampères alternating is only half that produced by 20 ampères direct or 20 ampères alternating. To a certain extent direct and alternating currents in a wire seem to ignore one another's presence. This property of direct and alternating currents has recently been applied by M. Mercardier, Principal of the Polytechnic School at Paris, to perfecting a system of telegraphy. He is able to send numerous telephone messages along an ordinary telegraph wire without affecting in the slightest the working of the ordinary telegraph instruments. The principle of the system is not unlike the phonopore of Mr. Langdon Davies, but instead of a tuned reed M. Mercardier uses a telephone adjusted so that it only responds to a current of a certain frequency. A diaphragm, 4 in. in diameter, vibrates in front of an electromagnet which is excited by the current from the line. A small piece of carbon in the centre of the diaphragm and another piece at the extremity of a long vertical spring complete the microphonic contact required to work the receiver. It is found that the currents in the line do not interfere in the slightest degree with one another, each receiver vibrating only to its own current. The system has been tested between Paris and Bordeaux. Twelve operators sent messages simultaneously for several hours whilst at the same time the ordinary telegraph messages were being sent. It is extraordinary that a single wire can transmit so many messages simultaneously without interference, and M. Mercardier believes that the number of messages could easily be doubled.

A Welsh Paradise.

DR. WHEATON'S Report to the Local Government Board on the sanitary circumstances of the Llandilofawr Rural District, Carmarthenshire, states that the dwellings are, as a rule, well-constructed of stone, but the downpipes discharge on the ground surface in the absence of drains to which they can be connected; many dwellings have been built without damp-courses; and from these causes and owing to the general absence of any impervious paving around houses, the foundations are soaked in moisture and the walls rendered damp. Water supply is pretty good (a public supply) at Upper Brynamman town and the group of dwellings known as Cwmamman; but at Panty-

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ffynnon the water supply is derived from a roadside watercourse, the water in which appears to be derived from the drainage of a field, and pig-sties and privies are now in course of erection within a few yards of the point at which the water appears to take its origin. At Ammanford there are a number of private wells in yards and in gardens, which are shallow, drysteined with boulders, sunk in the loose drift, and exposed to risks of contamination by soakage of liquid from cesspools, and by filth washed into the ground during periods of rainfall, from privies, and from collections of manure and refuse which are frequently situate in proximity to them. There are no house drains in connexion with dwellings in the district. There are a few cesspools and catch-pits in Ammanford district, in which liquid refuse from the surface is collected; but they are never emptied, and the filth escapes by soaking away into the ground, thus endangering the purity of the water furnished by neighbouring wells. Privies are in general use, but in some parts of the district appear to be regarded as unnecessary, and are sometimes used as pig-sties or store-places, and the ground around dwellings is often littered with excrement, the inhabitants being disinclined to make the exertion involved in going to a privy which may often be many yards distant from the dwelling-house, and disinclined also to make the necessary exertion required for emptying the privy and disposing of its contents. For the last reason privies are, wherever possible, set over water-courses so that the filth falls directly into the water; and in this manner many rivers and streams are polluted by fœcal matter.

The University Library, Cambridge.

THE Senate have "non-placeted" the proposal of the Library Syndicate to construct a building in the Schools Quadrangle. We understand that Mr. W. C. Marshall's plans and designs provide for a floor, level with the first floor of the existing rooms, resting upon iron columns set at a distance from the walls, clear from the buttresses, and so as to leave a passage-way around, the new floor being gained by a bridge, and being roofed in part with glass and iron. The quadrangle has suffered manifold changes since it was built at intervals on Nigel de Thornton's ground, and the gardens of the Crouched Hospital, Trinity Hall, and Corpus Christi College in the fifteenth century. The northern side (Divinity Schools) was finished in or soon after 1400; the western side (Canon Law School, since the Arts School, and library over it) was next begun, and completed fifty years afterwards; the southern side (Philosophy and Civil Law) was erected in 1458-70. Most of the tracery, wrought in soft stone, has disappeared from the windows. In 1659-60 is entered a charge "for cutting needless stone out of the windows to gain light" in the Divinity School. In 1583-4 the buildings had been underpinned, and in 1646-7 double rows of wooden columns had been placed under the floors of each of the schools. Thomas Rotherham, Archbishop of York, built in 1470-3 the Gothic eastern front, opposite Great St. Mary's Church, depicted in Loggan's bird's-eye view of about 1688. A Classical order replaced that front in 1754-5. Sir John Cotton bought the gateway for the courtyard at Madingley Hall, near Cambridge. Rotherham's statue, with those of his co-benefactors to the library, was placed in the gatehouse of the Old Court of King's College which the late Mr. Pearson incorporated in his new library buildings (1888-9) erected on the west of the old quadrangle. In 1829 the University bought for 12,000*l.* the buildings and site of the Old Court, and six years afterwards cleared the ground (whilst leaving the unfinished gatehouse), having in mind to rebuild the entire quadrangle. In the result the north side of Cockerell's design was erected, 1837-40, along Senate House-passage, Cockerell's design having been preferred to those of Wilkins, and Rickman. In 1864-7 was added the southern wing, extending westwards, by Sir G. G. Scott, who also added a third story to the Old Common Library on the south side of the older quadrangle. In 1716-7 the Law Schools were fitted as a library and the Dome-room was built. The Divinity Schools, beneath the catalogue-room, were vacated in 1879 at the opening of the Selwyn Divinity School buildings designed by Mr. Basil Champneys, opposite St. John's College. Loggan depicts the Schools Tower, or Belfry, containing the staircase in the south-eastern corner of the quadrangle which was pulled down in 1732 on the opening of the Senate House, when the Regent House over the Divinity Schools was taken for housing King George I.'s gift of the 30,000 volumes which he had bought for 6,000*l.*—the library of Dr. Moore, Bishop of Ely.

COMPETITION FOR FIRE STATION AND POLICE COURTS, MANCHESTER.

IT is somewhat surprising that only twenty-five sets of designs were submitted in this important competition, and of these one at least can only be regarded as a practical joke. The premiums offered were 300*l.*, 200*l.*, and 100*l.* (nearly 1 per cent. of the estimated cost of the buildings), and the Corporation undertook to employ a professional assessor "to assist them in determining the merit of the designs," and also stated that the designs would be submitted to a "quantity surveyor of repute," whose duty it would be to reject every design which would in his opinion cost more than 75,000*l.* The latter provision is a reflection on the decisions of some architectural assessors, who seem to think that a limit of cost is stated only to be exceeded, but is one which cannot fail to be appreciated by those competitors who honestly strive to prepare a design in accordance with the conditions. The work of competing architects was also simplified by the issue of plans of the four principal floors, drawn to a scale of 8 ft. to an inch, and showing the detailed arrangement of the several departments. These plans were complete as regards the fire-station, which is by far the most important part of the building, and also as regards the ground floor of the police and ambulance stations, but the branch bank, firemen's library, and policemen's quarters were only indicated in block, the details being left to the ingenuity of the competitors. Nearly all the competing architects have found these plans of the greatest service, although in no case has slavish copying been attempted; indeed, this was impossible, as the plans did not in every case tally with the amended schedule of accommodation. Broadly speaking, however, the competition, in consequence of the issue of these plans, resolved itself into a competition for the best external design accompanied with improvements in the details of the planning.

The site is in shape a trapezium, having the principal frontage (260 ft. long) towards London-road, a return frontage (284 ft. long) to Whitworth-street at right angles to the former, a rear frontage to Commerce-street (97 ft. 3 in. long) at right angles to Whitworth-street, and an oblique frontage on the fourth side (328 ft. 6 in. long) to Fairfield-street. All the angles were to be splayed, the length of the splays varying from 6 ft. to 15 ft. The area of the site is 5,632 square yards. The buildings shown on the so-called "sketch plans" are about 36 ft. wide, and are arranged around the site so as to enclose a large yard or quadrangle for drill and other purposes. The principal entrance to this yard is shown in the centre of the London-road frontage, the space to the right being devoted to the gymnasium, and that to the left to the library and bank. The end of the gymnasium forms the extreme left of the Whitworth-street front, and is followed by the three loose boxes and the repairing shops. The police-station extends from these to the junction with Commerce-street. The ambulance-station is in the middle of the short front towards the latter street, and nearly the whole of the Fairfield-street front is devoted to the fire-engine house and rooms appertaining to it. The second officer's house is at the obtuse angle formed by Fairfield and Commerce streets, and the stairs to the chief officer's house are close to the bank at the London-road end of Fairfield-street.

The first premiated design (No. 23), by Messrs. Woodhouse & Willoughby and Mr. John Langham, of Manchester, follows this arrangement pretty closely. The principal alteration is in the location of the gymnasium, this being placed with the end to London-road and the side to Whitworth-street, instead of *vice versâ*. This involves the removal of the repairing shops from the Whitworth-street to the London-road front. The police-station is in the position shown in the sketch plans, but the arrangement of the cells is altered so that each has an external wall in which a window is placed. This is decidedly an improvement. The stairs to the firemen's tenements and duty and recreation rooms are also designed with less wasted space on the landings. The tenements themselves, however, which are arranged on three floors over the fire-engine house, &c., are not improved; in the sketch plans the pantries are against the external walls and can therefore be lighted and ventilated, while in the accepted design they are in the middle of the building: the direct entrance from the balcony to the living-room is also less satisfactory in some respects than the passage arrangement suggested; and the central L-shaped hall or lobby in the middle of each tenement can scarcely fail to be dark and dirty. The policemen's tenements, which are not shown on the sketch plans, are more satisfactory; they are placed over the police-station, two on the first floor, three on the second, and one on the third, and are conveniently entered from the staircase landings and balconies. The remainder of the third floor over the police-station is given to the policemen's billiard-room and laundry, and the playground for policemen's children.

The library and bank are well planned, and the chief fire-brigade officer's house occupies the first and second floors over the latter. In order to provide a symmetrical front towards London-road a third story has been placed over the bank, &c., and allotted to bachelors' quarters. In the answers to competitors' questions it was distinctly stated that "no provision is to be made for single men."

The elevations are in the familiar type of English Renaissance, and each of the four has been carefully considered, which is more than can be said of many of the designs. The London-road front, which is the most important, has a slightly projecting central feature, containing the large arched entrance to the drill-yard, with an ungainly oriel over; columns and pilasters on pedestals run through the second and third stories, and the cornice is surmounted by a nearly semicircular pediment, above which is an equestrian group. There are four bays (with coupled columns in the second and third stories) on each side of the central feature, and beyond these are other projections (with rusticated quoins) rising one open story above the main cornice and terminated with semicircular domes. This group occupies the greater portion of the front, and has a rusticated ground story with wide, flat-arched windows; two windows are placed in the plain first story, over each ground-story window; above these, between each pair of pedestals supporting the coupled columns, there is a wide and low single window with semicircular arch; and in the third story the windows are again double and ornamented with the inevitable cheeses and tea-chests. To the right and left of the main group are recessed portions with mansard roofs, the cornice being a story lower. These lower portions are terminated by octagonal turrets rising to a considerable height. So far the elevation is symmetrical, but beyond the

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left-hand turret a portion over part of the bank is carried up to the central level, and crowned with an octagonal metal-covered cupola. The main cornice, except where the mansard roofs occur, is surmounted by a balustrade. The design bears evidence of careful consideration, but the pedestals supporting the coupled columns might with advantage be omitted; the second-floor windows are not of pleasing proportion; and the two gables enclosing semicircular lights (one in the centre of each curb roof) are quite out of character. The Whitworth-street frontage is more satisfactory. The grouping is quite different; at the middle and ends are portions with curb roofs, and between these are two higher and slightly projecting masses of six bays each, the end bays being brought forward and ornamented with columns and semicircular pediments. The ground story of the Fairfield-street frontage is very well designed, but the upper part is marred by the oval windows, nearly 8 ft. wide, and the projecting portions are over-windowed for satisfactory effect. The design as a whole is, however, well considered. Variety is given by the different massing of the four elevations, and the authors may be trusted to make improvements in detail during the preparation of the working drawings. Two bays are shown to a larger scale; the details are restrained and correct, but somewhat lacking in distinction.

The second premiated design (No. 25) is the work of Mr. George Watson, of Edinburgh, and, as regards the planning, follows the sketch plans still more closely than the accepted design. The prisoners' cells in the police-station are arranged (as in the sketch plans) in the middle of the building, with the corridors between them and the external walls, and are without direct light and air. The policemen's tenements are badly planned, being entered on two floors from narrow L-shaped corridors without windows; what these corridors will be like may be gathered from the fact that the long leg of each has a length of 90 ft., and the short leg 42 ft. Two of these tenements have the living-rooms and offices on the first floor, and the bedrooms on the second floor, the latter being approached by private flights of stairs.

On the first floor the doors of two tenements must be passed to reach the third. The elevations are simpler than those of the first premiated design. Some portions of the building are only three stories high, and the main cornice is carried round the whole building at the same level—that is to say, above the second-floor windows. This cornice has a plain frieze and no architrave. The detail is coarse, and there are some unhappy features, such as the heavy columns, 19 ft. high (rusticated in the lower parts), carried on corbels. The central feature of the London-road frontage is bald. The Whitworth-street frontage has for its central projecting feature an uninteresting mass of walling, with small windows to the stables on the ground floor, and slits to the hay and provender stores on the first and second floors; above is an attic story containing five wide arched windows and crowned with a pavilion roof and cupola. The apparent uniformity of height on either side of this attic story is deceptive, as the roof to the left is a curb roof, while that to the right is of ordinary pitch. The Fairfield-street front is more Dutch in character, and does not harmonise well with the London-road front.

The third premium has fallen to Messrs. Mangnall & Littlewoods, of Manchester. Their design (No. 19) follows the sketch-plans very closely. The tenements are slightly altered, the living-rooms being entered directly from the balconies, and the rooms being grouped around small dark lobbies in the middle, after the manner of the accepted design. A curious feature is that the first-floor tenements in Fairfield-street are *en suite*, the bedrooms and living-rooms of successive tenements having doorways between them; probably this is intended to show how a bedroom can be taken from one tenement and added to another, as circumstances may require. The planning has not been sufficiently considered in connexion with the elevations, with the result that the external grouping has a haphazard appearance, quite out of character with the Renaissance type of architecture adopted. This defect is most marked in the most important frontage, namely, that to London-road; the left-hand third of this front is a story lower than the remainder, and no attempt has been made to treat the whole as one dignified composition. The Whitworth-street front is more satisfactory, although the different treatment of the police-station, with the floors at a lower level than the rest of the building, may be objected to. The authors have been most successful with the Fairfield-street elevation; this has a four-storied portion occupying about three-fourths of the length, but not quite in the middle of the front; the end portions are a story lower. The central part has high-pitched gables at the middle and ends, the former being flanked by wide bays of small projection carried up an additional story and crowned with lofty octagonal roofs and cupolas. The upper portion of the hose-tower is picturesquely designed. Indeed, the detail generally is good, but the design is marred by unsatisfactory grouping.

After proceeding so far in his task, the first thought of the reviewer is that the remaining designs must be either commonplace or costly to have been passed over in favour of the three premiated designs, and this thought is in the main corroborated by inspection. Very few indeed of the twenty-two rejected designs are of striking architectural merit, and these have probably been rejected on account of the cost, as estimated by the quantity-surveyor, being in excess of the limit imposed. Design No. 1 is decidedly original both in plan and elevation. The gymnasium is placed in the middle of the London-road front, with the library and bank to the right, and the electrician's room and offices to the left. The engine and ambulance houses open into Fairfield-street, and the yard entrance is in the middle of the Whitworth-street front with the hose tower by the side of it. The chief officer's house is much too large, the drawing and dining rooms are 29 ft. by 20 ft., with bay windows in addition, and seven bedrooms, two bathrooms, three water-closets, sitting-room, boxroom, kitchen, &c., are also provided. Thirty-five complete tenements are provided for the firemen, and seven for the police, in addition to officers' quarters. The instructions asked for accommodation for thirty-five firemen and six policemen, and certainly seemed to indicate that complete tenements must be provided for all; the accepted design contains only twenty complete tenements for firemen. The elevations of design No. 1 are well conceived and admirably drawn. The three principal elevations are symmetrical with the exception of a tower at the left-hand corner of the London-road front, and show a dignified treatment, rusticated masonry being largely used and well-designed, carving being introduced in broad masses. This is a good design, but the author cubes it out to 1,717,363 ft., an amount considerably in excess of the first premiated design. The price allowed for the latter is 1s. a cubic ft., and for the former, 10½d.

No. 3 is an attractive set of drawings, but the engines are placed in Whitworth-street, and the drill engine-room is separated from the gymnasium. The author has thoroughly grasped the problem of the elevations, and has obtained a symmetrical and dignified front to London-road; a concave recess is planned, in the middle in which the archway (two stories high) leading to the yard is placed. The ground story is rusticated with segmental arches to the windows; massive columns run through the next two stories, and the main cornice is surmounted throughout the greater part by a mansard roof. The central tower is, however, weak, and the order adopted is not well proportioned. The fronts to Fairfield-street and Whitworth-street are more thoroughly Georgian in character, and of considerable interest.

The elevations of No. 8 are very elaborate and costly, but without freshness, and somewhat feebly drawn.

No. 10 shows a knowledge of Mr. Aston Webb's design for the Birmingham Law Courts, but "the little more and how much it is, and the little less and what worlds away."

The Fairfield-street elevation of No. 11 is the most successful of the four; the treatment is simple and generally refined.

Design No. 12 can only be regarded as a joke, and we trust that the Corporation will show their sense of its unfitness by withholding the two guineas which the author paid for the conditions of the competition.

The acute angle between London-road and Fairfield-street is cleverly planned in No. 14, but the elevations are rather heavy and costly.

No. 16 is shown in a set of wash drawings, which as far as draughtsmanship is concerned are decidedly the best submitted; no attempt has been made at symmetry, but the design is interesting throughout. The chimneys brought to the front of the buildings are, however, a mistake; they are diamond-shaped in plan, measuring about 7 ft. by 5 ft., and rising 24 ft. above the main cornice and about 19 ft. above the top of the parapet. The design is effective but costly. The cubical contents are about 2,500,000 ft.

No. 18 has the gymnasium in the middle of the London-road front, and the yard entrance in Whitworth-street. The tenements are ingeniously altered from the sketch plans, but the bathrooms entered from the balconies would not be appreciated. The elevations are of a pleasing character, and neatly drawn.

It cannot be said that the designs as a whole reach a high level. A commendable feature is that the authors' reports are appended to the drawings, but the authors' names are not given.

CONTINENTAL OPINION AND PRACTICE IN REGARD TO CEMENT TESTING.

THE third Congress of the International Association for Testing Materials was held in the Hall of the Royal University of Technical Sciences at Budapest, from September 9 to September 14. At this Congress a number of papers by representatives from different countries were read in regard to cement and cement testing. The following *resumé* of the contents of some of these has been forwarded to us from Budapest, and may be of interest as showing the state of opinion and practice on the Continent:—

In Germany especially the increase in the manufacture of cement has been enormous, and from the latest statistics it is to be feared that foreign cements, chiefly of German and Belgian origin, are supplanting the products of English manufacturers, even in England. During the first nine months of this year the imports of cement into Great Britain amounted to 156,760 tons against 70,439 tons for the corresponding period of 1900. The import of foreign cement into London has increased during the nine months by 244 per cent., although the neighbourhood of London abounds in the necessary raw materials. This seems to indicate that the English cement industry is not in a state of progress, and that English manufacturers must seek cheaper methods of production and possibly, at the same time, endeavour to produce better material.

The only paper presented in English, and the one which deserves the first consideration, as it directly affects a large number of English manufacturers, was one on "The Constancy of Volume of Cements," by Mr. Bertram Blount, of London, Cement Chemist and Expert to the English Admiralty and to several Colonial Governments. The author described a form of hot test for Portland cement which in its qualitative form has been long applied to cement to be used in the construction of harbours and other public works. It is proposed to adopt the test in its quantitative form as follows:—A bar of neat cement is exposed to the influence of water at 45 deg. C., and the expansion observed by means of the Bauschinger apparatus. A good cement should remain absolutely free from cracks and expand not more than 2 per cent., attaining constancy of volume in seven days. Experiments with sixty-eight specimens of cement, produced by five leading English manufacturers, gave satisfactory results in twenty-nine cases.

Commenting upon this paper, Professor Tetmajer, of Zurich, President of the International Association, and the best known authority on the Continent, observed that a hot test for cement was already adopted by the Swiss Federal Government, and of 127 specimens tested in his laboratory, which had fulfilled the requirements of the usual mechanical tests, only three failed under the hot test.

Mr. Blount's paper was eventually referred to a sub-committee of the International Association.

It should be mentioned that the opinions expressed in the papers read by experts of different nationalities indicate that a form of hot-water test will be included in the specifications for Portland cement to be discussed at the next Congress, especially in the case of cement required in the construction of harbours and in other heavy work.

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Professor H. Le Chatelier (Paris), in a paper on "Simplified Rapid Tests for Cements," discusses four methods which may be used for the acceptance, but should not be taken to warrant the rejection, of cement. The *fineness* of the cement can be tested by the sieves with 900 and 4,900 meshes to the square cm. The nature of the particles, which are so fine as to form a dust, is determined by observing the quantity of water required to produce a paste of a certain consistency. The *time of setting* can be readily ascertained by means of Vicat's needle or simply by pressure with the thumb. The setting is ended when no impression is left on the surface of the cement by the needle or the thumb. For determining the *constancy of volume*, a hot-water test may be employed. If placed in water at 100 deg. C., lime ceases to expand after three hours and magnesia after six hours. Cement manufacturers complain, apparently with justice, that the hot-water test is too severe, and that a cement which has stood the cold-water test for twenty-eight days is good, whatever may be the result of the hot-water test. The author of the paper has already shown that irregular strains in cement disappear in the course of time, and it is easily possible that cements which, under the influence of heat when setting begins, disclose a certain quantity of free lime may prove suitable in practice. Hence this test cannot be used for the rejection of cement, but in case the cement stands the test it may safely be accepted. The test consists in exposing specimens prepared from normal paste to the action of water at 100 deg. C. after the paste has been allowed to set for twenty-four hours. The expansion produced is measured either by employing Le Chatelier's needle forms or by Klebe's needle process, or by noting the external change of form in the specimens. The maximum expansion should lie between 1 and 2 per cent. Every well-conducted Portland cement factory can supply products which will satisfy this test. With regard to the mechanical tests for ascertaining the *strength of resistance* to tensile and to compression forces, only one need be carried out, since they give practically corresponding results. As cement is only used with sand, it is sufficient to test a mortar consisting of one part by weight of cement and three parts by weight of sand. The sand employed is prepared by mixing three kinds of sand of different grain. In the case of Portland cement, slag cements, and quick-setting cements the test may be concluded after eight days, since these cements have in that time attained their maximum strength. The practice of using stamped specimens arose from the desire of the manufacturers to point to a greater strength of resistance in their products, but is in reality without advantage. Either the tearing test or the bend test may be employed, but the latter is accepted as being the simpler. Bars of section, 20 by 20 mm., are placed on supports 100 mm. apart and bent seven days after the process of setting is complete.

Mons. M. Mercier (Paris) compared the results of tension tests with bricks of the usual 8 shape and of bend tests with prisms, using three kinds of sand in preparing the specimens, and showed that the percentage average deviation, calculated on the average of the results of six tests for each series, is smaller for prisms than for the bricks both for cement paste and cement mortars. The ratio of the resistance to tension and to bending is 1·9 for pure pastes of lime and of cement, and shows a tendency to increase when the specimens with the lapse of time become more solid. For mortars of lime and of cement the ratio is 1·7, and there is no tendency to increase in the case of tests of long duration.

Mons. L. Deval (Paris) described experiments proving that the presence of calcium sulphate occasions in hydraulic mortars an increase of volume which can exceed 100 per cent., the increase being due to the combination of the calcium sulphate with the tri-calcium aluminate of the cement. Calcium sulphate has no action on a cement which contains no aluminium or which does not contain enough calcium for the aluminium to form a tri-calcium aluminate. Those cements most exposed to injury under the influence of calcium sulphate are aluminium cements of feeble hydraulic powers, such as Portland cements. He determined for the compound produced in the expansion the formula $Al_2O_3 3CaO 3(SO_3 CaO)$.

A paper on "The Present State of Cement Testing in Germany" was read by Professor Max Gary, Chief of the Building Materials Department in the Royal Mechanical and Technical Testing Institute at Charlottenburg, Berlin. To this paper were appended a number of proposals which gave rise to a lengthy discussion, ending with the adoption of a motion by Professor H. M. Howe (New York), who proposed the appointment of an International Commission to collect, so far as possible before the next Congress to be held in St. Petersburg in 1903, material for establishing normal tests and specifications for Portland cement which may be used in international commerce. The following is a brief outline of Professor Gary's paper:—

The tests for Portland cement as at present employed in Germany are based on "The Revised Rules for the Uniform Supplying and Testing of Portland Cement," published in 1887 by the Association of German Portland Cement Manufacturers. The Prussian Ministers for Commerce and Industry and for Public Works issued ordinances to their departments enjoining the observance of these Rules, and shortly afterwards the same Rules were accepted by all the States of the German Empire. In recent years some changes have been made, and a complete revision of the Norms is in contemplation. In 1882 the practice was begun of mixing finely-ground furnace slags with Portland cement, and, consequently, in a preface to the Rules of 1887, Portland cement is defined as the product obtained by pulverising the shrunken mass resulting from the burning of an intimate mixture of substances containing lime and clay as essential constituents. Members of the Association are pledged not to bring into the market any other product than the above under the name of Portland cement. No foreign bodies may be added, either during or after the process of burning, except small additions to the extent of 2 per cent. required for regulating the time of setting. Members must submit their products to tests applied at the discretion of the governing Committee, and infringement of the regulation is followed by expulsion from the Association. Recently a number of new factories have been established, chiefly in connection with iron-works, which employ slag in the preparation of Portland cement. This slag it is important to detect, but unfortunately the methods proposed for this purpose are not readily applicable without special arrangements.

As the Rules are applicable only in the case of pure Portland cement produced in accordance with the above definition, a preliminary investigation must be undertaken to ascertain if impurities are present. If the raw materials are not properly chosen, defects arise principally from the presence of lime, magnesia, and gypsum. In good Portland cement there should be from 58 to 67 per cent. of lime and not more than 67 per cent., not more than 3 per cent. magnesia, and not more than 2 per cent. gypsum. The quantity of these three substances present can only be estimated by means of chemical analysis. As additions to Portland cement are employed: colouring matters, clay, sand, ashes, ground limestone, ground slate, hydraulic lime, trass, and silicates of lime, such as slag. These substances, with the exception of slag, are qualitatively detected without difficulty by determining the specific gravity, the rate of loss of heat, the action under the influence of diluted acids, &c. A reliable method of detecting admixtures of slag has hitherto been wanting.

For pure Portland cement Fresenius established the following limits:—

(*a*) A specific gravity of at least 3·125, and in any case not less than 3·1.

(*b*) A degree of alkaline strength such that a water solution containing ·5 grammes of cement neutralises 4—6·25 c.cm. $\frac{1}{10}$ normal acid.

(*c*) An absorption of 18·8—21·67 c.cm. of normal acid by 1 gramme of cement powder under direct treatment and in any case not materially less than this.

(*d*) An action in $KMnO_4$ solution (1·580 g. of $KMnO_4$ in one litre of water) so that 1 gramme of cement reduces from 0·79 to 2·8 milligrammes of potassium permanganate, and in any case very little more than this.

With the same $KMnO_4$ solution Fresenius found that under a similar treatment 44·34—74·67 milligrammes of potassium permanganate were required for different kinds of slag powders, the difference arising from the fact that in Portland cement iron is present almost exclusively in the form of ferric oxide, whereas in slags it is present only as ferrous oxide.

It has, however, quite recently become known that cements which have been burned in a revolving furnace or in the reducing flame likewise require the use of a considerable quantity of $KMnO_4$, although they do not contain slags. Therefore the $KMnO_4$ test has no decisive value for proving the presence of high-furnace slags, and can only be used as a preliminary test.

In testing for slags the cement is treated with $KMnO_4$, according to the method of Fresenius. If less than 3 milligrammes are required for 1 gramme of cement, the cement cannot be suspected of containing slag; if more than 3 milligrammes $KMnO_4$ must be used for 1 gramme of cement, then the cement can be:—

1. Cement from a revolving furnace (cement burnt in the reducing flame).
2. Cement mixed with high-furnace slag.
(*a*) Made out of raw materials with pieces of slag added.
(*b*) With slag added after the process of burning.
3. Cement to which slag has been added to form an intimate mixture before burning.

The cement is passed into a mixture of methyl-iodide and purified turpentine oil, possessing at 15 deg. C. a specific gravity of 3·01.

The light parts which swim in the fluid can be:—

(*a*) Coal of average specific gravity	...	1·30
(*b*) Gypsum	„	„	„	...	2·33
(*c*) Coal slack	„	„	„	...	2·73
(*d*) Furnace slag	„	„	„	...	2·94

With suitable fluids these different constituents can be separated.

The heavy parts which sink in the fluid of specific gravity 3·01 can be:—

(*e*) Cement of specific gravity 3·035.
(*f*) Iron from the furnace slag and different iron compounds.

The Prussian Rules have fixed no definite limits for the weight of the cement required to occupy a unit of space. They only aim at fixing the gross and net weight of the casks of cement usually found in commerce. The weight of such a cask of cement should be 180 kilogrammes gross and 170 kilogrammes net, and for half a cask 90 kilogrammes gross and 83 kilogrammes net; 180 kilogrammes gross correspond to 400 English pounds. The size of the casks is not prescribed. It has, however, become usual to determine the space occupied by the cement both in a loose condition and when well shaken down. Unfortunately, a uniform method for determining this does not exist. The form of vessel used in measuring is not fixed, although this is important, especially if the cement is in loose condition. Professor Gary recommends a litre measure of about 124 mm. diameter. For filling the measure a funnel with a sieve fixed in the lower orifice should be used.

Portland Cement may be of such a nature that it does not set in less than two hours, and is then described as slow-setting. Quick-setting cement sets in less than two hours. To ascertain the time of setting, pure slow-setting cement is stirred three minutes and quick-setting cement one minute in water until it forms a stiff paste. This is put on a glass plate to form a cake about 1·5 thick in the middle, but becoming thinner towards the edges. The degree of fluidity required for producing this cake shall be such that the paste, placed on the glass plate by means of a spatula, first begins to run towards the edges after the glass plate has been several times shaken, for which purpose, in most cases, 27 to 30 per cent. water suffices. As soon as the cake is hardened to such a degree that it resists a light pressure with the finger-nail, the cement must be regarded as set. For determining more accurately the time of setting and for fixing the moment when setting begins, a normal needle is employed, which weighs 300 gr. and has a cross-section normal to the axis of 1 square millimetre. Then a metal ring 4 cm. in height, and with a diameter of 8 cm., is placed on a glass plate filled with the cement paste of the above-mentioned fluidity, and placed under the needle. The moment in which the normal needle can no longer completely penetrate the cake of cement is to be taken as the beginning of setting. The time which elapses until the normal needle leaves behind on the hardened cake no visible impression is the time of setting.

This process possesses so many defects, that the Association of German Portland Cement Manufacturers, in common with the Testing

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Institutes of Charlottenburg and Stuttgart, are engaged in seeking for a more reliable method.

The decisive test for constancy of volume is as follows:—A cake of pure cement is placed on a glass plate, and then after the lapse of twenty-four hours, or after the process of setting is complete, put under water. If during the process of hardening under water deformations or cracks appear on the edges of the cake, this indicates "working" of the cement. This is, as a rule, already visible on the third day of observation, and at all events an observation extending over twenty-eight days is sufficient. The objection to this test is that it requires too much time for the "working" cement to be recognised, and it is rarely possible to wait long enough to allow of a decisive result being obtained before using the cement. Hence the necessity of a more rapid method of determining the constancy of volume. The different hot tests proposed by Michaelis, Heintzel, Tetmajer, Maclay, Deval, Erdmenger, &c., are not decisive because they frequently characterise cements of inconstant volume as constant, and lead to cements perfectly suitable for building purposes being suspected of not possessing constancy of volume. These tests cannot be used for rejecting cement, but are advantageously employed for roughly testing products in the factory, for cements which must possess a special degree of constancy for particular purposes (vessels for hot substances, fine cement articles, large structures lying exposed to the air, &c.), and for testing cement which contains magnesia. Bauschinger's apparatus as improved by Martens is employed for measuring the expansion, and occasionally Klebe's method, in which is used a measuring-rod inserted between two needles fixed at a certain distance apart while the cement is still soft.

With regard to fineness, the Prussian Rules prescribe that Portland cement shall be so finely ground, that if tested with a sieve of 900 meshes to the square centimetre, and such that the thickness of a wire shall be equal to half the space between two consecutive wires, there shall remain on the sieve at most a residue of 10 per cent. The degree of fineness required by this regulation is inadequate in the present state of the German Portland cement trade. The tests carried out at the Charlottenburg Institute show that most German cements leave a very small percentage of residue on the sieve of 900 meshes per square centimetre, and cements which leave more than 20 per cent. residue on a sieve of 5,000 meshes to the square centimetre are very rare. For such a degree of fineness it is impossible to obtain sieves of identical uniformity of structure. Moreover, it appears from recent researches that the finest ground cements, if kept lying in stock, undergo a further refinement to an extent altogether indeterminable by means of sieves, but which is apparent from the change in the weight of powder in a loose condition required to occupy a unit of space. It will be necessary to give up this sieve method, and have recourse to the wet method or to sifting with wind.

The binding force of Portland cement is determined by testing a mortar consisting of three parts by weight of a normal sand and one part by weight of cement. The test is carried out after a uniform method by applying tensile and compression forces with the same apparatus to bodies of similar shape and the same sectional area. Professor Gary proposes to discard the minimum limits of solidity hitherto accepted, or furnish them with a new mark by which the cementing limit between cement and sand would be expressed in such a manner that it could be seen which cement attains a certain solidity with the highest proportion of sand. The normal sand employed is procured by taking pure quartz sand and passing it through a sieve of 120 meshes per square centimetre, the thickness of the wire in the sieves being ·32 mms. The normal sand is taken from the Hammerthal pits in Freienwald.

The Prussian Rules prescribed that the cement and sand should be mixed with 10 per cent. of water, but with cements so finely ground as is now usual in Germany, 10 per cent. water is almost always too much. It is necessary to ascertain the quantity of water which can most advantageously be employed in mixing the cement. To obtain uniformity in mixing, the Steinbrüch-Schmelzer apparatus is employed. The mortar is worked up with 8 per cent. and 10 per cent. of water in moulds provided with grooves, and it can be seen which quantity is more suitable from the circumstance that with the proper quantity of water cement paste should begin to flow in the grooves after 90-100 blows. The quantity of water thus ascertained is used in preparing the specimens for the resistance test. For hammering the specimens intended for the tension and compression tests, Böhme's apparatus, carrying a hammer of 2 kilos, is used, and every specimen is subjected to 150 blows. These hammers are tested in the Charlottenburg Institute to ensure uniformity. With regard to the form of specimens tested, those subject to the tension test have a section of 3 square cm. at the surface of rupture, and the compression test is carried out with cubes, of which each side contains 50 square cms.

The Prussian Rules advise the compression test as the standard test for resistance, as mortars in practice are usually subjected to compressive forces. It has, however, become customary to judge Portland cements exclusively by the tension test, as this can be more conveniently carried out. The effect is that German cement factories, for the most part, guarantee a fixed degree of resistance to tension in the (1 by 3) mortar, and a high resistance to tension is sought for regardless of durability. The Association of German Portland Cement Manufacturers has this year decided to give the compression test the first place, as this test gives more reliable results than the tension test. Professor Martens has shown that the probable error varies in tension experiments, on an average, between ± 3 per cent. and ± 5 per cent., and in compression experiments the error varies only from ± 1 per cent. and ± 3 per cent. The decisive test is carried out after twenty-eight days, although there is usually a preliminary test after seven days. A specimen made with three parts by weight of normal sand and one part by weight of cement should, after hardening for twenty-eight days—one day in the air and twenty-seven days in the water—have a minimum resistance to tension of 16 kilos per square cm., and a resistance to compression of at least 160 kilos per square cm. These figures are higher than those of all other countries, but still too low for the present state of the German cement industry, which owes its prosperity to the careful observance of the Rules and the perfecting of the methods of testing.

It may here be mentioned that, on the invitation of the Russian Minister it was decided to hold the next Congress of the Association at St. Petersburg in September, 1903.

Among the 1,748 members of the Association are 418 Russians, 363 Germans, 232 Austrians and Hungarians, 166 Americans, 97 Frenchmen, and 87 Englishmen.

THE SURVEYORS' INSTITUTION.

AN ordinary fortnightly meeting of this Institution was held on Monday at 12, Great George-street, Westminster, Sir J. Rolleston, President, in the chair.

The minutes of last meeting having been read and confirmed, and Mr. J. W. Penfold, hon. secretary, having read a list of donations to the library and library fund,

Mr. A. Dudley Clarke read a paper on "The Final Report of the Local Taxation Committee." The terms of reference to the Commission were: "To inquire into the present system under which taxation is raised for local purposes, and report whether all kinds of real and personal property contribute equitably to such taxation; and, if not, what alterations in the law are desirable to secure that result." The Commission sat for the first time on March 11, 1897, and its work resulted in the examination of 162 witnesses and the publication of eight volumes of evidence and memoranda, in addition to three Reports. The further Reports, dealing with Scotland and Ireland, have not yet been issued. There has not been unanimity of opinion amongst the members of the Commission, but there has been substantial accord on several important issues. The Report of the Majority (Lord Balfour of Burleigh being the Chairman) is signed by twelve out of the fifteen members of the Commission, but there are reservations on the part of some of them to some portions of the Report. Those of the Chairman bring him nearly into line with the views of the Minority Report. There is also a separate Report on Urban Rating and Sites Values, and a Report by Judge O'Connor, who dissented from all his colleagues.

The author dealt with the Reports in a long and able paper, but the subject does not come sufficiently within our province to be noticed at greater length in our pages. A hearty vote of thanks was accorded to the author on the motion of Mr. Sabin, seconded by Mr. G. S. Mathews, and the discussion was adjourned until January 27. The next meeting will be held on December 9, when a paper will be read by Professor Somerville on "Artificial Manures."

THE INSTITUTE OF BUILDERS.

MR. WOODMAN HILL gave a lecture (illustrated) entitled, "Submarine Construction by Diving and other Compressed Air Methods: Cylinder Sinking and Tunnelling under Compressed Air," in the Drawing-room of St. James's Hall, Piccadilly, on Wednesday, the 20th inst.

There was a large attendance of the members of the Institute of Builders, their friends, and representatives of the various branches of the architectural, engineering, and surveying professions. Mr. Charles Wall, President, occupied the chair.

The following is an outline of the lecture:—

After briefly tracing the development of diving from the days of Aristotle to the time of the open-helmet dress, first constructed in 1830, in the employment of which the lecturer subsequently had actual personal experience, he minutely described and illustrated the modern appliances used for diving, the various circumstances under which diving operations are undertaken, and gave valuable information as to the depths at which they are practically possible, and the type of men suitable for this class of work. He also referred to the attempts made to use artificial light under water, to the expedients used for establishing efficient communication between the diver and the surface, and to the great improvements made in this respect after the introduction and perfection of electrical appliances, improvements which would have been impossible without them. A complete modern diving-dress, and helmet fitted with a telephone apparatus, and also a relic of former days in the shape of an original open helmet made by Deane, were to be seen in the lecture-room. The advantages and disadvantages of bell work were then discussed and compared with the work of the individual diver, illustrations of actual works accomplished by both systems being given and explained; these were notably the building of the foundations for the Spithead Forts, the constructions of the foundations for the circular heads of the defensive harbour at Portland now in progress, and a typical example of a sea wall of concrete blocks founded on concrete in bags.

Works constructed of concrete blocks weighing thirty to forty tons apiece, and the positions in which they are necessarily and successfully employed, were next dealt with, and the respective merits of staging with steam winches and of Titan travellers compared; illustrations being given of the staging, travellers, and bells employed in the construction of the various piers and breakwaters at Folkestone and Dover, and of a Titan traveller employed on a Russian breakwater, and the Titan setting the last block of the detached Mole at Gibraltar.

The chapter dealing with this branch of submarine work was concluded by referring to the construction of piers and breakwaters in the open sea by means of concrete in mass deposited in casings or large bags, almost all examples of which have proved unsatisfactory, Mr. Hill giving it as his opinon that, to construct submarine foundations in mass concrete successfully, would require it to contain so large a proportion of cement that the work would be as expensive as building with concrete blocks in which the ordinary proportions of materials were used, and always more risky to execute.

Reference was then made to the rectification and deepening of the channel at the entrance to the Hamoaze at Devonport, which was entrusted to, and has been executed by, the speaker's firm, and which necessitated the removal of portions of shoals, covering in the aggregate an area of more than 30 acres, the depths of which varied from a few inches to 20 ft., and which consisted almost entirely of limestone and shillet rock. The drilling barges, boring appliances (used in a bell worked with compressed air), and dredgers, which were specially designed and constructed for the

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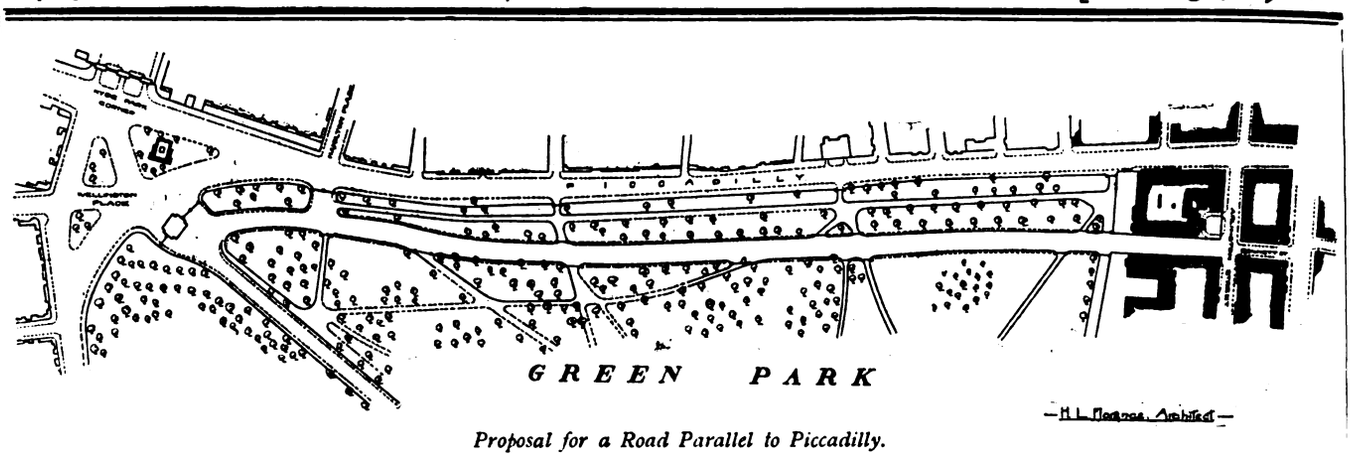

Proposal for a Road Parallel to Piccadilly.

work, were illustrated, but only very briefly described as not coming within the scope of a paper on construction.

What may be described as land works requiring the employment of compressed air, on account of more or less percolation of water through the strata to be dealt with, were then briefly entered into, and the methods of cylinder sinking by the compressed air process, and the employment of these methods in dock work and continuous quay-wall work abroad were explained and illustrated; the instances mentioned were the construction of the foundations of the harbour of La Pallice at La Rochelle in France, the wharf walls in the Garonne at Bordeaux, and also dock work on a large scale at Genoa; the author expressed his opinion that foreign engineers were much in advance of English ones in the employment of these methods.

Reference was then made to the dock works at Keyham, where a portion of the main outer sea-wall is being built upon concrete columns sunk to the depth necessary to secure a solid foundation by novel and interesting methods. The lecturer concluded his paper by speaking generally but briefly of what he described as horizontal cylinder driving or tunnelling by compressed air methods, as found necessary in the gravelly and sandy portions of the City and South London Railway, the Waterloo and City Railway, the Tower Subway, and also in connexion with the completed Blackwall Tunnel, which he described as the finest work of the kind in existence.

The President thanked Mr. Woodman Hill for his able and interesting lecture, and a cordial vote of thanks, moved by Mr. T. F. Rider, seconded by Mr. John Greenwood, was passed to him.

COMPETITIONS.

Dispensary, Leeds.—The designs of Messrs. Bedford & Kitson, architects, of Leeds, have been accepted for the new public dispensary for Leeds, to be erected in Hartley Hill, North-street. The present building is to be demolished in connexion with street improvements.

Pavilion, Llandrindod Wells.—In the competition for pavilion, laying out recreation-ground, &c., Llandrindod Wells, the first premiated design was by Messrs. R. Wellings Thomas & W. Alec Millward, Llandrindod Wells. The second premiated design was by Mr. J. H. Williams, Worcester; and the third by Mr. E. P. Morris, Llandrindod Wells.

Builders' Clerks' Benevolent Institution.—At a special general meeting on the 26th inst., Mrs. Sarah Gough was elected to a full pension of a widow, 24*l.* per annum. Mr. Wm. Seymour was also elected to the builders' clerks' pension of 30*l.* per annum.

Cornwall County Asylum Extension.—At Cornwall County Asylum, on the 21st inst., Major C. E. Norton, R.E., held an inquiry on behalf of the Local Government Board into the application of Cornwall County Council for an extension of their borrowing powers and for permission to borrow 105,000*l.* for the extension of the asylum. Mr. Cowlard, Clerk to the County Council, explained that for the extension of the asylum 105,000*l.* would be required. The tender of Messrs. Pethick Bros. was for 87,973*l.*, the cost of furnishing was estimated at 8,000*l.*, and drainage 2,000*l.* Mr. Trevail informed the inspector that the stone to be used was local stone, and Mr. Cowlard observed that the period of the loan would be as long as possible. There was no opposition.

PROPOSAL FOR A NEW ROAD PARALLEL TO PICCADILLY.

The accompanying plan has been prepared to show an alternative scheme to the official proposal already before the public in regard to the relief of the congested traffic in Piccadilly. The inadequacy of the method suggested to widen Piccadilly by taking a strip off the Green Park up to Walsingham House has been pointed out in most of the organs of the Press, and the practical result of this scheme would be to create a worse block than at present exists where the narrow part at Berkeley and Arlington streets commences.

As a means of obviating this difficulty it is proposed to continue the line of Jermyn-street and Bennett-street by a road parallel to Piccadilly, through the Green Park, to a junction with Constitution Hill at the Wellington Arch.

Only one house in Arlington-street would have to be acquired to open out this route; the public underground conveniences, recently constructed at great cost, facing Devonshire House would not be interfered with; the new road, being generally at a lower level than Piccadilly, would not seriously diminish the attractiveness of the Park; comparatively few trees would have to be removed; and the present Piccadilly pavement, trees, and railings would be unaltered.

This duplicate line of transit east and west could not fail to attract the carriage and cab traffic, thus greatly relieving the overcrowding from Hyde Park Corner to Piccadilly Circus, and although this road would, like Constitution Hill, be closed at night, no inconvenience would result therefrom, as the congestion only exists in the daytime.

An additional relief would be afforded by the entrance to the new road through gates facing Hamilton-place.

It is to be hoped that the authorities may yet give further consideration to this matter before deciding upon carrying their present plan into execution.

H. L. Florence.

ARCHITECTURAL SOCIETIES.

Edinburgh Architectural Association.—New rooms have been acquired for this Association. They are situated at No. 117, George-street, on the first floor, and consist of two large apartments. The room to the back forms the meeting-room for lectures, while the front room is the reading-room. The rooms have been improved, electric light introduced, and completely redecorated. It is intended that the front room will be used as a sort of clubroom where members may consult the books in library and the professional journals. Stationery is also provided for use. Smoking will also be allowed in this room.—At the last meeting of the Committee of Management it was resolved to present a testimonial to Mr. Thomas Fairbairn in recognition of his long service as Honorary Secretary to the Association, and to invite subscriptions for the same. Subscriptions to be payable to Mr. John Johnston, C.A., Hon. Treasurer, 28, Dundas-street.—The Council have had under discussion the designs for the new buildings, proposed to be erected at the Castle, and recently exhibited in the City Chambers. After having inspected the plans, the site and the probable effect from various points of view, and having fully considered the question, they resolved as follows:—"The Council desires to express its sense of the courtesy of the War Office in giving the citizens an opportunity of seeing and discussing what is proposed to be erected on a site so unique in position as Edinburgh Castle. The Council feels most strongly that a site of its commanding position demands the most careful and skilful consideration, and although it is evident that no little attention has been directed to the preparation of the designs, the Council observes with great regret that from any point of view the outline of the great mass of the Castle and its buildings will be disfigured; and, further, that the general designs do not commend themselves as being in harmony with the better work on the Castle Rock. The Council trusts that, as this question is one of very great and permanent importance, nothing will be done without further serious consideration."

Leeds and Yorkshire Architectural Society.—The first meeting of the winter session of the Leeds and Yorkshire Architectural Society took place on the 21st inst. at the Queen's Hotel, Leeds. Mr. Butler Wilson, President, occupied the chair. During the evening the prizes were distributed to the successful students. For the best measured drawing work the prize was given to Mr. S. R. Day, of Skipton. To Mr. J. Hinchcliffe, formerly assistant with Mr. Bowman in Leeds, and now of Chorley, in Lancashire, four prizes, making a total of eleven guineas, were presented. One was for the design of a village church, another for the construction of a village church roof, a third for the best essay on ancient ecclesiastical architecture in Leeds, and a fourth for sketching. A letter was read from Mr. George Corson presenting to the Society the portrait of himself which had been given to him by the members of the Society. Mr. Corson was the Society's first president when it was founded twenty-five years ago, and it is partly in commemoration of that fact that the painting, which is by Mr. H. Willson, was subscribed for. The gift was gratefully accepted. The President, in his inaugural address, said the Council of the Society had suggested that, in the event of the Leeds Queen Victoria Memorial Committee deciding to place the proposed memento in Victoria-square, the area of the square should be increased, and that an architectural laying out of the square should form an inseparable part of the scheme. A resolution to this effect had been forwarded to the Lord Mayor, and there was every reason to hope that it would receive consideration. To students he would say that in these days of accumulation of material things the great requisite for success was enthusiasm. The means of education to-day opened out a path by which students might follow in the footsteps of the authors of the greatest architectural achievements. The Royal Institute of British Architects, with which the Leeds and Yorkshire Society was allied, had over 1,740 members, and there could be no better foundation for an architect's education than the working for the qualifying examination of the Royal Institute. Dealing with the progress and outlook of the profession, Mr. Wilson observed that any man who left this country twenty, or even ten, years ago was amazed on his return at the changes that had taken place in our towns and cities. There had been a vast increase of population and education, and, it followed, a greater amount of accommodation had been required for intelligent persons, so our great towns and cities had turned in their sleep, and were now in the process of rehabilitation.

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Already the principal streets of our cities were overcrowded and almost impassable, and the necessity for subways was suggested on all hands. "In this wholesale reconstruction," the President proceeded, "we see the danger of uncontrolled action, and we, as being principally concerned in the responsibility, will have to take strong measures in dealing with the danger. Our cities are of themselves undergoing great transformations—they are in closest touch with each other by railway, and also in many cases electric traction is establishing the greatest intimacy between them and their neighbouring villages. Most of the reconstruction seems to have been carried out without plan or system, or any consideration for the ultimate development. No thought is given for providing great arteries of communication from centres to outlying districts; architectural treatment is uncontrolled; owners and builders seem to have had carte blanche for ugliness. I would suggest that these conditions ought to be effectively dealt with, and that schemes be prepared for the probable and ultimate development of our cities and towns consequent on their rebuilding, proper sites for future public buildings being carefully selected; that provision be made for subways; and that the insanitary areas be cleared in accordance with such schemes; so that the whole may be homogeneous as well as conglomerate." The formation of County Councils in place of rural and urban authorities was resulting in the erection of public institutions, county halls, hospitals, and asylums. These designs were often inadvisably obtained by competition, perhaps a clumsy and costly means of obtaining the best results, and certainly very costly so far as the profession of architecture was concerned, for the conditions of competition were usually unfair and unreasonable, and even in the event of an architect winning a competition, it did not always follow that the execution of the work was entrusted to him. The subject was, he was glad to say, receiving very serious attention.—Mr. H. Perkin proposed a vote of thanks to Mr. Wilson for his instructive address. Mr. W. H. Thorp, in seconding, said that within a few weeks the Society would reach the twenty-fifth anniversary of its foundation. The presence of so many young members of the profession that evening augured well for the Society's future. The President having acknowledged the compliment, the remainder of the evening was devoted to a smoking concert.

MANCHESTER SOCIETY OF ARCHITECTS.—At the Queen's Hotel, Manchester, a few days ago, the annual dinner of the Manchester Society of Architects (Incorporated) was held. Mr. Alfred Darbyshire, the President of the Society, presided. The President, in proposing the toast of "The Royal Institute of British Architects," spoke of its numerical growth. He could not help referring to the fact that some fourteen or fifteen years ago the designs of Mr. Emerson, the President of the British Institute of Architects, were chosen in the competition for a cathedral at Liverpool as being the best. The organisers of the Liverpool Cathedral scheme had now decided to build it on another site, and it was one of the most regrettable incidents which had occurred in their profession that Mr. Emerson had decided not to compete again.—Mr. Emerson, in replying, said that, in connexion with this matter of the Liverpool Cathedral, he had been surprised to see a statement that it was to be sincerely hoped that the genius of the country would produce a building in a new style. He could not help thinking that such remarks were calculated to do an enormous amount of harm and cause a deterioration in architectural progression. No doubt there was a very considerable striving after originality at the present time, but, unless one could show that it was better to diverge from known principles and known proportions, it was better to stick to the old lines.—Mr. E. Salomons, who proposed the toast of "The Corporation of Manchester," said that the Improvement Committee was not an originating committee. It never seemed to have a grand scheme in hand. It was always widening Cross-street by 6 ft., or Market-street by 2 or 3 yds.; but never, in his fifty years' experience of Manchester life, had he seen any really grand scheme put forward in Manchester. He had been abroad a great deal and seen what they had done there in the setting up of boulevards, particularly in the case of Brussels, where a grand boulevard had been made 250 ft. wide, with two rows of trees on each side of it. Of course, in Manchester they could not grow trees, but he had never seen such an idea put forward in regard to Manchester; they had never had any suggestion of that kind; nothing but merely the widening of streets. He hoped that under the régime of the present Lord Mayor of Manchester they would see some such scheme for the development of Manchester which they had never seen before. He had also been informed that it was proposed by the Manchester Corporation to appoint a city architect, and not merely a city surveyor or engineer. They had felt the want of it for many years, and he believed it was on the *tapis* that such a man would be appointed. He trusted that, under the guidance of their Lord Mayor, the right man might be chosen.—The Lord Mayor, in replying, said he had to fall foul of the proposer of the toast, because he differed *in toto* as regarded the appointment of an architect by the Corporation. He believed that it was better that, in the matter of architecture, competition should be open to all the architects of the city. He could not but think that it would be a loss to the community that there should be just one stamp put upon the buildings of Manchester. He went along with the members of the Society that there should be a wider view taken of what a great Corporation should do in the direction of matters pertaining to the architectural profession. They did not live in heroic times, and the Corporation was very largely governed by questions of rates, and however brilliant their fancy might be, they found that fancy very effectually curbed by the position in which the rates stood. At the same time, he believed that such a great community as Manchester might do great things for art, and he had some hopes that the time would come when the pursuit of the beautiful would not be dissociated from, but rather regarded as a handmaid to, the struggle for material comforts. Mr. Percy S. Worthington proposed the toast of "The Victoria University and Owens College," to which Mr. A. Hopkinson, Principal of Owens College, replied. The other toasts included "The Manchester Society of Architects," proposed by Professor Tout, and responded to by the President; "Our Hon. Legal Adviser," proposed by Mr. J. B. Gass, and responded to by Mr. W. Goldthorpe; and "The Hon. Secretary," proposed by Mr. John Ely, and replied to by Mr. Paul Ogden.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The second meeting of the Session was held on the 20th inst., Dr. W. de Gray Birch in the chair. At the Council meeting previously, Dr. Birch was unanimously elected hon. treasurer of the Association, in succession to Mr. Charles Lynam resigned. The Rev. R. I. Woodhouse exhibited an iron crucible weighing 6 lbs. 10 oz. bearing evidences of a hinge at one time existing, which was found at Merstham, in Surrey, not a great distance from the neighbourhood of the Sussex Ironworks, at which it had probably been made. He also exhibited a clay or terra-cotta money-box considered by Mr. Gould and others to be of early seventeenth century date. Miss Dobson brought for exhibition some brass and bronze coins, the finest being a brass of Lucilla, daughter of Marcus Aurelius, 147 A.D.; others were of Probus, Tetricus, and Galienus. Mr. Patrick, hon. secretary, made an exhibition on behalf of Mr. Chas. Lynam, and read some notes he had prepared in description of a fine series of photographs of the recent excavations and discoveries at Arbor Low, in Derbyshire. Mr. Andrew Oliver exhibited some curiosities from Russia, including a brass "icon" in three compartments, a brass figure of St. Michael with an inscription in Greek at the back, and a plaque of mother-of-pearl engraved with the "Nailing to the Cross." Mr. Thomas Fisher exhibited a large stone (porphyry) recently unearthed in Threadneedle-street, at a depth of 20 ft. below the surface, and Mr. Garside a photograph of a very fine celt in excellent condition, found at Rowarth, in Lancashire, and another of a so-called "Druid's Chair" from near Stockport. Mr. W. J. Andrew exhibited through the Rev. H. J. D. Astley a fine cinerary urn still containing cremated ashes, the urn bearing the inscription: "L·MVNIVS·PPRISCVS ALLIAE PRISCAE FILIVS ARTEMAE·NEPOS," which was found in the garden of Justinian, and was probably originally in a columbarium.—The paper of the evening was by Dr. Plowright, of King's Lynn, and was read in his absence by Mr. Astley. The paper dealt exhaustively with the "Archæology of Woad" from the earliest times down to the beginning of the nineteenth century. It was well illustrated by drawings and photos of woad mills and implements connected with its manufacture, both in this and other European countries, and references to the chief books upon the subject were given. The earliest references to woad as the source of a blue dye colour occur in the classics, the most familiar being that of Cæsar in his Commentaries. Pomponius Mela and Pliny also mention it. At the opening of a barrow at Sheen, near Hartington, some years ago a considerable quantity of woad-indigo was found in lumps and in powder—the sepulture probably being that of a dyer. Frequent reference is made in ancient documents to the sale of woad, or "wad," as it was then called, and still is by the woad grower of the fenlands of East Anglia. There is a roll preserved in the records of the borough of King's Lynn, dated 1243, setting forth the dues payable upon various commodities in which "woad" or "wad" is included. There is one locality in England where woad is still regularly cultivated for dyeing purposes, viz., the fenland districts of Cambridgeshire and Lincolnshire. An interesting discussion followed the paper, in which Mr. Forster, Mr. Gould, Mr. C. J. Williams, and others took part, the Chairman remarking that woad was at first called Glastum or Glast, Glastonbury—or with the Saxons, Glastingbury—having a reference to it; and at Bridgewater, in Somersetshire, there used to be a large trade carried on in woad.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Islington Borough Council 5,811*l.* for electric light installation; Kensington Royal Borough Council 4,750*l.* for street improvement; and the Guardians of Poplar Union 4,775*l.* for the erection of officers' quarters at the workhouse.

The Council's Bricklayers.—Captain Swinton asked if Lord Welby had any further information to give the Council on the subject of the amount of work done by the bricklayers in the Council's employ.

Lord Welby, Chairman of the Finance Committee, said he would remind the Council that it was first stated there had been a considerable diminution in the work done, especially by the bricklayers, of late years. Last week he stated that the Works Sub-Committee had made inquiries on the subject, and up to a certain point they came to the conclusion that, so far as the evidence before them went, there had of recent years been a diminution in the amount of work done by the bricklayers, but that recently there had been an improvement. The Committee had continued its inquiries, and the result confirmed the general impression. But the circumstances varied considerably in the various cases before them, and it was impossible for them at the present moment to state in any specific form what the production had been, and what had been the increase of late. They were pursuing their inquiries, and would bring a Report up. There was one point he must notice. It had been stated that the laying of 330 bricks per day was considered a fair day's work for a bricklayer by the Council. He need hardly say that the Committee had never given encouragement of any sort or kind to such a limit as that. It was the desire of the Council to be a model employer, and that the wages given should be in accordance with the wages given by the best of employers. But if they gave good pay there must be some reciprocity, and a good rate of pay must be rewarded by a good rate of work, and to secure that they would give unwavering support to the Works Manager.

Captain Swinton asked if, in reporting, the Committee would go into the matter of other branches of labour besides bricklaying.

Lord Welby promised to take that question into consideration.

Inventions by Officials.—Considerable discussion took place on a Report of the General Purposes Committee dealing with an amendment of the Standing Orders relating to inventions by officials of the Council. The recom-

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mendations of the Committee in effect prohibited any official or servant of the Council in future taking out a patent for any invention which is in any way connected with his official duties. Further, for any invention not connected with his official duties, an officer must obtain the consent of the Council before taking further steps other than taking a provisional protection.

Mr. Beachcroft moved an amendment to the effect that the Standing Order remains as at present, except that certain words be omitted.

The amendment was carried.

Working-class Dwellings.—A detailed return was made by the Housing of the Working Classes Committee, showing the receipts and expenditure in respect of all working-class dwellings and lodging-houses erected or owned by the Council for the year ending March 31, 1901. The dwellings mentioned in the account comprised 2,041 tenements, 305 cottages, and 324 cubicles, providing accommodation for 12,196 persons. During the year accommodation was provided for 2,608 persons, while since the closing of the account reported upon additional accommodation has been provided for 1,908. The gross income for the year was 44,226*l.* 12s. 3d., and of this 47·06 per cent. was required for outgoings, a slightly smaller percentage than in the previous year.

The report was adopted.

Tenders.—The following recommendation of the Parks and Open Spaces Committee was agreed to:—

"That the offer of Messrs. Flavell & Churchill (187*l.* 10s.) to supply certain piping, damper gearing, &c., to replace worn-out portions of machinery, &c., at the Battersea Park pumping station, and the offer of Messrs. C. Yates & Co. (133*l.*) to supply new boiler seating, engine foundations, &c., be accepted."

The Highways Committee recommended, and it was agreed,

"That Messrs. J. G. White & Co. be allowed to sub-let to the Anderston Foundry Co. the manufacture of the cast-iron yokes and road-boxes and of the other cast-iron work specified in the contract for the roadwork and platelaying in connexion with the reconstruction, for electrical traction, of the London County Council Tramways between (*a*) Westminster Bridge and Tooting, (*b*) Blackfriars-road and Kennington, and (*c*) Waterloo-road and St. George's-circus."

Appointment.—Mr. C. A. Daubney was appointed as a surveyor in the Architects' Department, on the recommendation of the Establishments Committee.

Post Office Telephone Charges.—The Highways Committee presented a report, and recommended that a copy of it should be sent to the Postmaster-General, "with an expression of the regret of the Council that the scheme of the Post Office telephone system for London does not establish real and effective competition, as recommended in the report of the Select Committee of the House of Commons of 1898, and does not secure to the public the advantages which they have been led to expect."

Mr. Benn, Chairman of the Committee, said he brought up the report with great regret. The Council had devoted ten years to endeavouring to secure for London an efficient telephone service at moderate charges, but they had been betrayed. The arrangements to be made by the Post Office were known to the National Telephone Company last September, and had the effect of forcing up their stocks to 366,000*l.* increased value; so that those who were "in the know" made a lot of money. Even now the Council would be happy to take over the Post Office telephone plant, and to supply London at provincial rates.

The debate was adjourned.

Piccadilly Widening.—The Improvements Committee reported the result of a conference with the First Commissioner of Works as to the proposed widening of Piccadilly from Hyde Park Corner to Walsingham House, and presented a modified scheme, extending only to that portion of the thoroughfare between Hyde Park Corner and Down-street. They proposed to cancel the Council's vote of 30,000*l.* for the complete scheme and to substitute an estimate of 13,536*l.*

After some remarks by Mr. Low, Mr. Campbell, and Mr. Davies (Chairman of the Committee), the modified scheme was adopted by the Council.

The Council adjourned at seven o'clock.

Books.

Brunelleschi. By LEADER SCOTT. (Great Masters in Painting and Sculpture.) London: George Bell & Sons. 1901.

WE are glad to notice any book that deals appreciatively with the life and work of a great man. In the textbook before us Leader Scott pays tribute to an architect of the very first rank—Filippo Brunelleschi. We know of no buildings more dominated by the individuality of genius than the churches of San Lorenzo and Santo Spirito. In these Brunelleschi established the form and detail now identified as the Italian Renaissance, although in their calm dignity and grace they are less Italian than distinctly Florentine. The capstone of his popularity, however, has doubtless been set by the dome which he reared upon Arnolfo's unfinished cathedral. The story of the dome is here written down for us with much interesting circumstance. The story of how Filippo took to his bed and left Ghiberti, his incompetent partner, to work out his own undoing, loses none of its relish by restatement. The struggles and differences between the architect, the opera, and the guilds are also retold. Whether the *Maestri di Pietra*, or Guild of Master Masons, was ever so responsible a body as we are invited to consider it, is open to question. The author hints darkly at co-operative building and the mysteries of Freemasonry. We see no reason, however, to attribute to the many what it is within the powers of one to accomplish. It is at least gratifying to note that Brunelleschi undeniably showed himself the master of the *Maestri* in this instance. The chapter referring to these events is entitled, "The Great Dome." It is, indeed, a great dome, but not so great a one as the author supposes. It has not a span of 200 ft. in diameter as stated. It is barely 140 ft. A mistake like this is a serious one, which might have been easily avoided.

The affectionate relationship existing between Brunelleschi and Donatello will always add a charm to the biography of either; and it was a fitting tie between the two men who moulded, in one case the architecture and in the other the sculpture, of the fifteenth century in Italy. The book is well illustrated.

The Art of Building a Home: A Collection of Lectures and Illustrations. By BARRY PARKER and RAYMOND UNWIN. London: Longmans, Green, & Co. 1901.

THE authors have in a series of essays or lectures endeavoured to cope with the unmeaningness of design and useless ostentation that characterise so many of our dwelling-houses. They have done so with a sincerity of purpose that we cannot but commend. If the essays have faults, they are the faults of enthusiasm. Yet we cannot help thinking that they would have been improved by a little more elasticity and a little less seriousness.

There is a reasonable halting place between the materialism of Mr. Whistler's famous "Ten o'clock" and the opposite extreme. Why, for instance, when discussing the relation of a house to its surroundings, should the authors tell us that "in the country certainly the low house is more successful, more in harmony with the scenery; perhaps because it is suggestive more of man's dependence upon nature, less of his defiance of her powers." The first portion of the sentence is obviously open to considerable extension and modification. A house which happily groups itself beneath the shelter of trees might appear insignificant when standing open on a plain; and although another, when perched upon a hilltop, might with propriety be unassuming in its sky lines, we have nevertheless seen a bolder treatment quite as successful. It is not an easy matter, we know, to develop statements within the limits imposed by a short essay, and a writer should therefore be the more careful as to the statements to which he commits himself. As for the reason given in support of the opinion we have quoted, we will only say that it had been much better left out.

It is reasonably insisted that a house, to be in any sense perfect, must be built to suit the habits and needs of those who inhabit it. We sometimes think, indeed, that the very whims and oddities of the occupier would have greater justification for expression than the whims and oddities of the architect, who has but a twelve months' acquaintance with his building. But since a house is built to last presumably for ninety-nine years, and will probably change hands more than once in that period, and since it cannot be all things to all men, it must become a glaring inconsistency if a certain moderation be not observed in the first place. Therefore, although originality in an architect is exceedingly desirable, good sense and moderation are equally so.

In the numerous illustrations with which the book is provided, there is ample evidence of originality on the part of the designer. Whether all the suggestions there shown, or referred to in the text, are to be desired is perhaps open to question. Although our authors, for instance, may have a preference for "the rich variety of colour and tone of light and shade of the naked brickwork" for interior walls, other folk may possibly find it most inconvenient for more practical reasons. It will hold the dust, it must soon become soiled and remain soiled, while a barked knuckle would be the least important injury that it could inflict. The edges of books, of furniture, would all suffer. We were about to add picture frames also, but pictures of any kind, we are told, look only less absurd on the walls of your house than they do upon the walls of an exhibition. Carpets are a further abomination. By such whims as these, the authors, as it seems to us, defeat their own ends. That a convenient and commodious living room should take the place of the three tiny "reception" rooms generally provided in the small house is reasonable enough. But we like, nevertheless, to see our favourite prints upon the walls, and enjoy the sense of warmth and colour, and, we may also add, quiet, which is lent by a carpet covering partially, at least, an expanse of oak floor. It is truly observed that the size of a room bears no relation to its cosiness. It is a quality conferred upon it by those who live in it. Yet the limitations imposed by the writers of this book will make it a more difficult matter than heretofore. There are one or two other points, we notice, which are likely to interfere with the comfort of the best of rooms. We question, for instance, whether a dog-grate could be satisfactorily put into so large a fireplace opening as in plate 16. Such grates require a great deal of humouring or they will smoke. We have also observed that exposed ceiling joists, with the ceiling contained between them, will buckle and crack the plaster, unless some binder takes the place of bridging, which is necessarily omitted.

However, the book offers so many suggestions to an intending home builder, that he must be content to take his risk with some of them.

Building Construction. By CHARLES F. MITCHELL, assisted by GEORGE A. MITCHELL. Third edition, thoroughly revised and much enlarged. London: B. T. Batsford. 1901.

THIS useful work, the third edition of which has just been published, has been further enlarged by a good deal of new matter and many new illustrations. The increase both in the number of illustrations and in their size is indeed the most prominent feature of the new edition. Several double-page plates have been added, among which, one, giving working-drawings of a large hammer-beam roof (of the Westminster Hall type), deserves special notice, as it ought to be of much interest and value to students. Even in this plate, however, objection must be taken to some of the detail, as being either badly placed or inharmonious—in short, as failing in the elementary grammar of design; but how such lame and tawdry "ornament" as some of that shown, for instance, in fig. 402, should be chosen to set before beginners for imitation, surpasses our comprehension. It is only fair to the authors of this work to say that they appear to aim at, and on the whole have been successful in maintaining, a somewhat higher standard of taste in their examples than is found in the other manuals of "Building Construction." As compared with those specimens of the very worst type of engineer's detail which the well-known "Notes on Building Construction" have rendered too familiar to many generations of students, with sad results on the vernacular building of the country, Messrs. Mitchell's drawings are, indeed, much to be commended. But they have need of improvement still in this respect; for to scatter broadcast as patterns—with the certain prospect of their repetition in thousands of

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suburban houses—such abominably proportioned windows (no weaker word can describe them) as those of the "picturesque" cottage on p. 297 is, from an educational point of view, a serious fault.

With the same object, the sound instruction of youth, in view, and also in their own interests for the sake of a wider circulation, the authors may pardon the suggestion that they would do well, when next revising their work, to engage (besides an architect to prune and proportion their designs) some one conversant with common literary English, to correct and sometimes rewrite their letterpress. For it is a pity, indeed, that a work on which not only so much labour has been bestowed, but which is also so really good and valuable in many ways, should be marred by clumsy and faulty writing. Take the following passage, for example :—

"Fresco painting is a system of mural decoration in which pictures are painted on the finished surfaces of walls, with water-colours, which incorporates with the same."

This drawback must always prevent the work from gaining the high position as a text-book which it might otherwise take, for though the material is well worth making into a book, a real book it can hardly be called so long as it contains so much "specification" or "surveyor's English." There are many depths of bad English, but perhaps none so repellent and so painful to read as this particular jargon. In the preface to the present edition thanks are given to several persons for assistance in revision, and to one in particular "for his careful reading of the proofs." Seeing that the reader whose services are thus acknowledged is a member of a distinguished university, we can only suppose that he was restricted to testing the accuracy of the mathematical calculations (a most important point in itself), and that English grammar and spelling were not in his brief.

Among the new features of the work which should be mentioned are, as stated in the preface, that "advantage has been taken of American experience in iron and steel manufacture and in construction, and of Scotch practice in modern stonework," and that "many of the more important and pertinent by-laws of the Local Government Board and London County Council are included." Also that "in most trades a typical specification, approved by some important public body, has been inserted." The chapters that have been most largely added to are those on materials, foundations, vaulting, dome and bridge construction, roof coverings, wood roofs, joinery, and sanitation.

The work seems now to have reached its limit of thickness with respect to convenience, and if further additions have to be made, the authors should look to the abandoning of useless matter ; for instance, there could be no loss in omitting such things as the two rather unpractical fire-resisting floors which take up the best part of pp. 387-8, one being an invention of Viollet-le-Duc, never probably used in this country, and the other a quite obsolete system, employing joists of cast-iron. We trust that in the next edition, whenever it may be called for, the authors will not be content with additions and slight corrections only ; but that they will instead make searching amendments throughout the work, so as to bring it up to that higher level of merit to which, with such a good solid substructure as it already possesses, it might with comparative ease attain.

First Stage Building Construction. By BRYSSON CUNNINGHAM, B.E., A.M.I C.E. (The Organised Science Series.) London : W. B. Clive.

AN examination cram-book of the barest and dullest type this little volume appears to be from first to last. There is nothing whatsoever original about it, and when the field is already so much better occupied, it is cause for wonder why such an unnecessary publication should be produced. It gives the impression of someone without the slightest interest in building having "got-up" to order a number of old South Kensington Examination papers, and then compiled a key to them. These papers are themselves responsible, of course, for the many useless and ridiculous things which the young student of building is expected to be acquainted with, as well as for the omission of several very elementary and quite essential matters which he is oddly supposed to have nothing to do with. But even when writing with such standards in view, an author with any enthusiasm for his subject would contrive to bring in a little reasoning and suggestion of better things into his text, together with something better than the hackneyed drawings which have done duty in so many previous manuals. But there is no trace in this work of any attempt or even desire to lift the student's view a hair's-breadth out of the Board of Education rut ; it is merely a collection of routine statements, throughout which the word "is" refers to things solely as they appear in the examination syllabus, not as they either are or ought to be in reality. According to his lights, the author has performed his duty faithfully, accurately, and to the letter, but we should be sorry to recommend the work to architectural students as being likely to lead them in the right way.

Primer of Geometry, Comprising the Subject Matter of Euclid I-IV. Treated by the Methods of Pure Geometry. By H. W. CROOME SMITH, B.A. London : Macmillan & Co., Ltd. 1901.

FOR many years past the feeling has been more or less prevalent that the accepted versions of Euclid do not constitute entirely satisfactory aids in the teaching of geometry. Many of the defects and difficulties that puzzled students of a bygone generation have been eliminated from various modern text-books, but much that is illogical and inconclusive still remains, even in some so amended treatises. Mr. Croome Smith believes the time has come for the presentation of "a reconstruction of the subject which it is claimed is much more than a mere revision of Euclid's system, while it in no way strains those principles which mathematicians are agreed in recognising as axiomatic." In attempting a reconstruction, the author tries to avoid the points in which the system of Euclid is at fault. For example, in Book I. he teaches the theory of parallel and inclined lines and rectilinear figures without making use as Euclid does, of the circle, with whose properties the student is not supposed to be acquainted. No one will question the argument that it is doubtful logic "to make use of the circle in the early stages, and subsequently to use the properties thus demonstrated of lines, angles, &c., in demonstrating the properties of the circle." Teaching on such lines is distinctly cyclical, like that in many spelling books where the meanings of words are concealed by correlative definitions. Again, the author is correct in characterising as illogical the assumption that recognition of a theorem can be dependent on any particular method of carrying out a construction. The consequences of supposing the theorem to be dependent upon the problem are that theory becomes involved and circuitous, and that inconvenient methods for the solution of problems are encouraged.

Mr. Croome Smith defers problematic construction until theoretical principles have been discussed in logical order in his Books I. to III. The student, therefore, reasons with representative points and lines, and his mental exercise is untrammelled by practical considerations. Finally, when the book of problems is reached, he will find the methods to be fairly in agreement with those adopted in actual practice. In the three first books of the primer the whole theory of Euclid I.-IV. is included, all theorems of similar character being brought together as far as possible, and generally converse theorems are included as one proposition. This treatment is useful, conducing both to logical consistency and to brevity. The latter quality is further aided by the employment of simple, precise, and intelligible definitions in substitution for the less direct phraseology sanctioned by long use. In his definition of a straight line, the author includes the idea of direction, thus suggesting a sight along the line to find whether it is "one which lies evenly between the two extreme points." The innovation appears to be good, and more likely to aid the conception of a straight line than the device sometimes proposed of applying a flat ruler to a line drawn on paper. The idea of motion is advantageously introduced into definitions of the angle and the circle. According to the author an angle is to be measured by "the amount of revolution of a straight line when turned about the vertex in the plane of the lines from the one to the other." Thus, a right angle involves one quarter of a revolution, an angle of two right angles is formed by one half of a revolution, and an angle of four right angles results from a complete revolution. Inasmuch as the straight line that revolves must be terminated by a geometrical point, we get at once the conception of the circle from the definition of the angle of four right angles. Further, the idea of revolution in connexion with an angle leads to the consideration of an angle which is greater than one of two right angles. Architects, engineers, and surveyors —the latter especially—do not regard an angle as a dead corner formed by two set lines, but as the outcome of motion. This being so, the author is strictly logical in asking why writers should pretend to exclude the idea of revolution from elementary geometry. The term "structure," as used by the author, seems conveniently to denote any combination of lines and angles, or anything constructed, and the term "magnitude" is only employed by him in its abstract sense. "Duplicate" is a term chosen to designate such structures as are equal in all respects. Everybody knows what it means, and it is effectively applied to the proof of certain theorems in the present primer. Many beginners have racked their brains over such expressions as "parallelograms about the diagonal of a parallelogram" and "the complements of the parallelograms about the diagonal." In such geometrical figures there is nothing difficult ; the only thing in the way of comprehension is the luxuriant language in which their definition has been hidden. The method of treatment followed in the four books is distinctly original, and it will be found an interesting study to compare the demonstrations of the author with those contained in any standard version of Euclid's Elements. From what we have already said, it will be understood that the arrangement of the propositions is by no means identical with that of Euclid, and we notice that in many cases two or even three propositions are included in one demonstration. If the present attempt at reconstruction should be favourably received, the author promises to extend the scope of his primer. That the book will serve a most useful purpose in further suggesting the need for reform, we do not for a moment doubt, but the work of altering established methods of teaching is a stupendous task, which the most sanguine can hardly hope to accomplish within the limits of a lifetime.

Modelling: A Guide for Teachers and Students. By ED. LANTERI, Professor of Sculpture at the Royal College of Art, South Kensington; with a Preface by ONSLOW FORD, R.A. London : Chapman & Hall. 1902.

IT would seem almost superfluous to praise a guide to modelling by Professor Lanteri. In this work the student may follow the whole process through a series of remarkable photographs from the construction of the armature to the finished state of the figure or bust. The building up of the muscles and prominences, with the added vigor of the thumb marks left upon the clay, is presented in the various stages of progress, the student being thus led forward step by step. Plate 14, which shows the first stage in modelling a mouth, is a typical example of the method employed throughout the book. "Leave your work in such a state that it will interest you when you take it up to-morrow" was the wise advice once given us. Undue haste in the endeavour to obtain a finished effect will take all the life out of the clay. Professor Lanteri shows us how interesting the phases or stages may be made, while he makes it evident that there is but one way of achieving the desired end. He insists that a knowledge of anatomical form must in the first place be mastered, and the reason of these forms, or the student will become involved in those "unreasoning alterations which are always tried when this branch of instruction has been neglected."

There must be few who will not recognise the truth of this criticism, or be unable to recall the tedium of those "unreasoning alterations" by which they have endeavoured to rectify some short cut to proficiency.

STATION HOTEL, NOTTINGHAM.—The Victoria Station Hotel at Nottingham has just been completed. The new hotel is situate in the heart of the city, immediately adjacent to the Great Central Railway. The architect was Colonel Edis.

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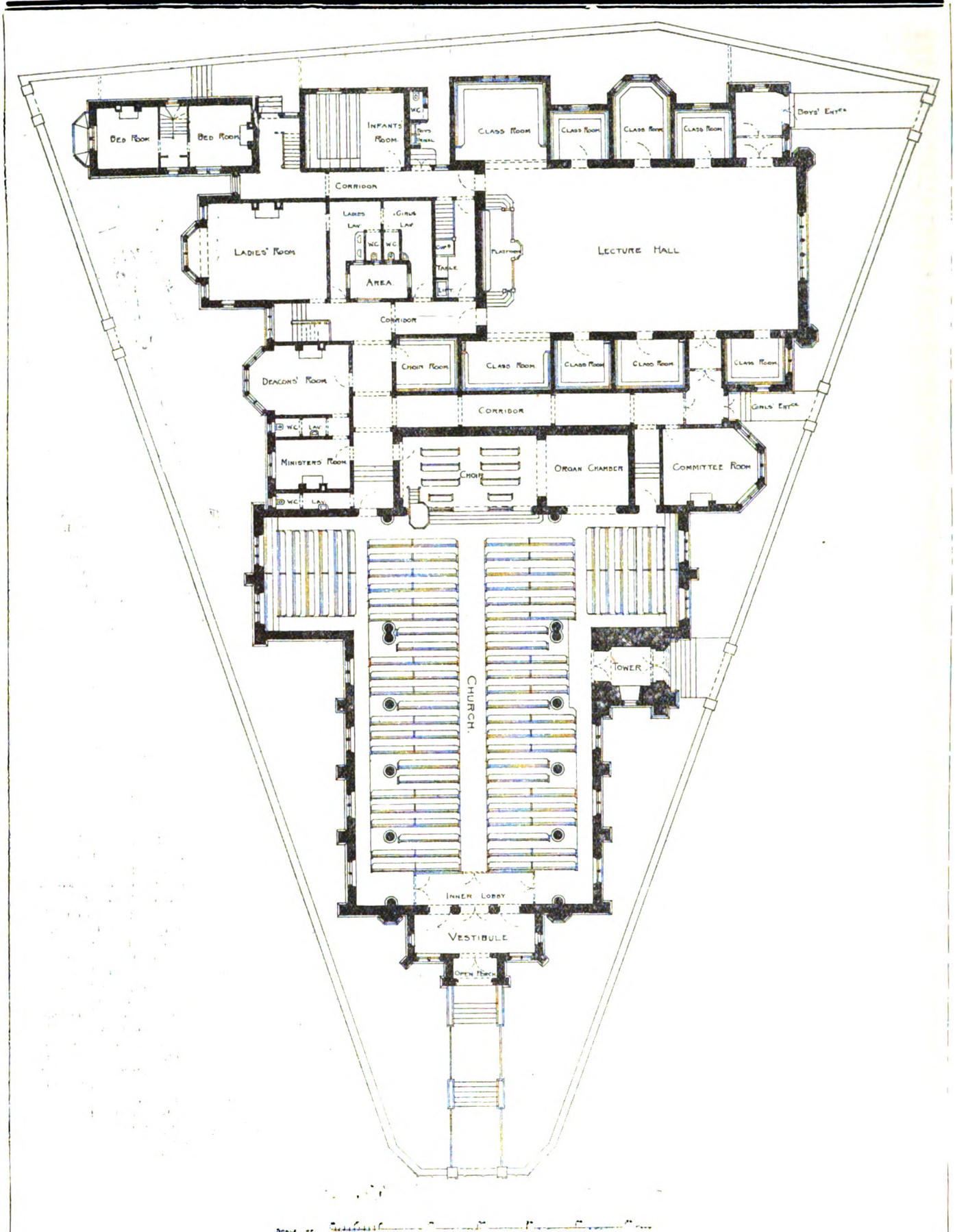

Congregational Church and Schools, Leeds. Plan.

Illustrations.

CENTRAL HALL FOR NEW CITY OF LONDON SESSIONS HOUSE.

IN our issue for June 30, 1900, we gave the elevations and plans of Mr. Mountford's competition design for the new Sessions House, together with an interior view of the central hall as then intended.

The present illustration, from a drawing which was exhibited at the last Royal Academy, shows the central hall design as remodelled and in our opinion very much improved. The dome is now a circular one on pendentives, in place of an octagonal one carried on squinch arches over a square plan. The first design was more novel and unusual, but this has much more breadth and unity.

The central dome is 37 ft. square on plan and 66 ft. high above the floor, the main cornice being 41 ft. above the floor. On each side of the central dome are lower ones 27 ft. square on plan, the three making a hall 104 ft. long, from which the four courts are all directly entered. The floor and lower portion of the walls will be of marble.

CONGREGATIONAL CHURCH AND SCHOOLS, WOODHOUSE-LANE, LEEDS.

THE church, which is now in course of erection on a site in the centre of a residential population, together with the school and class-rooms which were opened last month, will

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form a complete and compact block of buildings well adapted for the purpose intended. The ground covers 2,700 square yards, and is situated at the junction of two wide thoroughfares, slightly rising. All the rooms are on the same floor, except part of caretaker's house and kitchen, &c.

The church has been planned with wide nave and narrow aisles, transepts, chancel, and organ-chamber. It is 95 ft. long, 48 ft. wide, and 82 ft. across transepts, and is capable of seating 760 adults. At the junction of the streets an open porch with inner vestibule is placed, over which is a seven-light traceried window terminating in a gable with angle turrets. At the junction of the nave and transept next Woodhouse-lane is placed another entrance, over which the tower and spire rises to the height of 130 ft. At the end of the chancel another seven-light traceried memorial window is placed, to be filled with stained glass.

The school or lecture-hall is connected with the church by two wide corridors, and is 64 ft. long, 34 ft. wide, and 26 ft. high, well lighted by a five-light window at the front and clearstory windows at sides; with eight classrooms at sides (those near the rostrum can be thrown open to the schoolroom when required). A ladies' parlour, 30 ft. by 24 ft., is conveniently placed with all necessary conveniences. Pastor's, deacons', and choir vestries, and infants' room are also provided.

The buildings are erected of pitch-faced wallstones and fine sandstone dressings, all outer walls lined with brick, all internal woodwork of pitch pine unvarnished, the roofs covered with the best dark Westmorland slates, all windows filled in with leaded lights, and the whole building lighted by electricity. The cost of the building, exclusive of land and fees, &c., is 14,800*l.*, and the principal contractors are Messrs. C. Myers & Sons, masons, and Messrs. H. Atkinson & Sons, joiners, both of Leeds, and the whole is from the design and carried out under the superintendence of Mr. G. F. Danby, architect, of Leeds.

RESIDENCES NEAR LONDON.

THE three houses illustrated have recently been erected on the Kelsey Manor Estate, Beckenham, Kent, and in the rear or west side overlook the charming park and lake.

The general contractors were Messrs. Syme & Duncan and Messrs. Popeland & Son, of Beckenham. The architects were Messrs. Thomas Archer and Francis Hooper, of London.

CATESBY HOUSE STABLES, NEAR DAVENTRY, NORTHANTS.

THESE stables were erected for Mr. Henry A. Attenborough in the centre of a very favourite hunting country, and so arranged that, in case of need, the coach-houses could be converted into additional loose-boxes.

Ample space is provided for washing both horses and carriages under cover. A separate room is built for drying saddles and horse-clothing apart from the harness. There is a smithy next the loose-boxes, an isolated box in case of sickness, and an estate carpenter's shop over one of the coach-houses. The head groom's rooms are over the harness-rooms, &c., and the turret contains large storage tanks.

The buildings are in close proximity to the site of Catesby Abbey, and the water supply is obtained by force-pumps from the fishponds which were formerly part of that establishment.

The general contractors were Messrs. G. & H. Bywaters & Sons, of King-street Regent-street, W. The architects were Messrs Thomas Archer and Francis Hooper, of London.

A DECORATIVE PAGE.

THIS piece of work illustrates two pages of an illuminated copy of the old French romance "Aucassin and Nicolette," which Mr. Cowlishaw is writing out and decorating in this form with a view to its being subsequently bound by Mr. Cobden Sanderson.

The romance was probably composed about the beginning of the thirteenth century. Nothing is known of the author, but the book is one held in much respect by students of old literature. The single manuscript known to exist is preserved in the Bibliothèque Nationale at Paris.

The musical notation in the verse sections is a transposition from the notation in the edition of MM. Moland and d'Hericourt, and known as that of Franco of Cologne, who probably lived about 1250.

The version here given is translated from the old French by Mr. F. W. Bourdillon, from whose notes this information is given.

SOME EXAMPLES OF METALWORK.

THE articles shown in this plate are designed by Mrs. Starkie Gardner, who is giving special attention to the class of furniture illustrated here, with a view of introducing articles of this kind combining artistic design with moderate price.

The locks, finger-plates, and handles are executed in brass, pewter, copper, or iron, all hand hammered. The brass rim lock is intended specially to go with oak doors. The pendant for a billiard-room was a special commission carried out to order.

The style of Mrs. Gardner's work, as will be seen, is picturesque and artistic, while avoiding the eccentricity into which recent designers have sometimes run in their search after novelty in work of this class.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Brixton.†—A chapel, with buttresses, at St. Gabriel's Training College, Cormont-road, Camberwell (Mr. P. A. Robson for the Rev. Canon C. E. Brooke).—Consent.

Westminster.—A porch at the entrance to Members'-mansions, No. 36, Victoria-street, Westminster (Messrs. Ardron & Dawson for Mr. J. Browne Martin).—Consent.

Hackney, South.—The retention of two projecting entrance staircases at the schools on the north side of Cassland-road, Hackney (Mr. T. J. Bailey for the School Board for London).—Consent.

Width of Way.

Whitechapel.—The retention of a building used as a urinal on the south side of Corbet's-court, Little Pearl-street, Whitechapel, with the external walls of such building at less than the prescribed distance from the centre of Corbet's-court (Mr. J. Tickle for Mr. E. Bell).—Consent.

Means of Escape from Top of High Buildings.

Westminster.—Means of escape in case of fire proposed to be provided in pursuance of Section 63 of the Act on the seventh, eighth, ninth, and tenth stories of the easternmost portion (described as Block A) of the residential flats with shops on the ground floor, known as Park-mansions and situated on the south side of High-road, Knightsbridge, between Brompton-road and Knightsbridge-green (Mr. G. D. Martin for Messrs. A. Kellett & Sons, Ltd.).—Consent.

Westminster.—Means of escape in case of fire proposed to be provided in pursuance of Section 63 of the Act on the eighth and ninth stories of Blocks A, B, and C of St. James's-court, Buckingham-gate, Westminster (Mr. A. Blackford for Mrs. Leeds).—Consent.

The recommendation marked † is contrary to the views of the Local Authority.

BOOKS RECEIVED.

MANCHESTER: THE CATHEDRAL AND SEE. By the Rev. Thomas Perkins, M.A. (Geo. Bell & Sons.)

MEDIÆVAL LONDON. By W. Benham, F.S.A., and Charles Welch, F.S.A. (Seeley & Co.)

VILLAGE CLUB, BLAGDON, SOMERSETSHIRE.—On the 23rd inst. the Right Hon. Lewis Fry formally opened the clubhouse which Sir W. H. Wills has provided for the village of Blagdon at a cost of upwards of 2,000*l.* The club is situated in the centre of the village. It is a domestic Gothic structure, with half-timber work above the ground floor. The building is two stories in height, and is built of native stone. On the ground floor are the reading-room and library, the former being 30 ft. by 18 ft., and 12 ft high, whilst the latter is 20 ft. by 18 ft, and of the same height. A staircase leads from the hall to the upper rooms, which are of the same dimensions as the lower, one being intended for the billiard-room, the other the games-room. The architect is Mr. Frank W. Wills, of Bristol. Messrs. J. & C. Clark, of Rickford, were the builders.

Correspondence.

To the Editor of THE BUILDER.

THE "CA' CANNY" (GO-EASY) QUESTION.

SIR,—In reference to the *Times* article and your comment thereon, permit me to say, that having been in the building trade (boy and man) for forty years, as apprentice, journeyman, foreman, clerk of works, and manager, I have come to the conclusion that many, if not most, of the charges against the men are utterly void of foundation. Masters are frequently prejudiced by interested persons in authority, who shield their own neglect and deficiencies behind the men. The incompetence, most rife in the building trade, lies not in the *labour* so much as in the supervision. Incompetent foremen; incompetent estimators, or, as they now style themselves, surveyors; clerical routine, instead of practical execution; a smattering of technical knowledge instead of experience; these are the evils of the building trade, and coupled with trading on borrowed capital, or working the jobs on the strength of the "draws," constitute the real crisis. How many real builders are there, either in town or country, to-day?

Then, again, the "too old at fifty" business is another curse. Personally, I am a better man now as regards ability and power to carry out works than ever; but I am obliged to work at "half-cook" because masters and public bodies look askance, and in effect say, "grey hairs are upon you," a biblical reference with which all employers are doubtless familiar. Investigate by all means, but begin at the right end. I hold no brief for trades unionism. I am not, and never was, a member of any trade combination; but I flatter myself that, allowing for the increase in the rate of wages, without either bullying or dancing attendance on the clerk of works at the bar of a public-house, I can get work done as cheaply now as twenty years ago. I say work, because the 1,000 or 1,200 bricks referred to were practically tumbled in from a barrow.

As I read the signs of the twentieth century, it appears that the day of the "big contractors" is gone. The day of the specialist has come. Except for the use of scaffolding and hoisting machinery, is there any job which could not be worked by a manager for the architect and client as effectively as a manager or foreman now does it for a builder? With a reliable man, and a depôt for the hiring of scaffolding, &c., and the working of stone by stone firms and joinery by joinery firms, the real practical builder could be on the works; the staff regulated by the size of the job. The architect would then be in touch with his work without the intermediary either of a capitalist or a clerk of the works. Perhaps, as John Bright said of politics, so of building—the time may come when an honest man may engage in it; until then, perhaps, I shall only be "one of the young men who dream dreams."

ONE FROM THE BENCH.

*** There may be a good deal of truth in our correspondent's letter, but it does not touch the main point of the discussion—are men compelled or persuaded to do far less work in a day than they could do and used to do, at the orders of and in the interests of the trade-unions?—ED.

ROOD SCREEN, ST. DENYS', SLEAFORD.

SIR,—In your issue of November 16 appeared a plate of the above screen, and on the top was the following lettering, "Drawn by Mr. Herbert Kirk, Diocesan Surveyor, Sleaford."

I beg to point out that the drawing was executed solely by me, and that the words referred to should never have been inserted. Mr. Wilfrid Bond assisted me to measure it, but beyond that it was my work entirely. C. H. LANFEAR.

*** The words were inserted by us to complete the title in the usual way by giving the draughtsman's name. We received the drawing from Mr. Kirk, and certainly were under the impression that it was his own. Perhaps Mr. Kirk can throw some light on the matter.—ED.

PRESERVATION OF OLD BENCH ENDS.

SIR,—At Packington Church, in Leicestershire, some very interesting fifteenth century bench-ends have been brought to light. They had been buried in damp mould; and one or two of them are in a condition that makes them like hardish putty. Can you or any of your readers suggest any treatment which would harden and preserve them without destroying their present beautiful colour and surface? HENRY PROTHERO.

PROPOSED THEATRE, MANCHESTER.—It is stated that proposals are on foot for the erection of a new theatre in Manchester. The site suggested is the rectangular piece of ground lying between the Refuge Insurance Buildings, in Oxford-street, and the Manchester South Junction and Altrincham Railway line. The name of Mr. Alfred Darbyshire is mentioned as the architect.

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The Student's Column.

GAS AND GAS FITTINGS.

21.—The Properties and Manufacture of Calcium Carbide.

PROPERTIES OF CALCIUM CARBIDE.—Calcium carbide is a dense solid compound of calcium and carbon. Its chemical formula is CaC_2, which indicates that it consists, when pure, of 62·5 per cent. by weight of calcium combined with 37·5 per cent. of carbon. It is neither explosive nor inflammable, and may be strongly heated in an open fire or in a gas flame without undergoing any change. When exposed to the atmosphere, calcium carbide, like a lump of quicklime, slowly changes into a bulky powder. This change of condition is due to the water vapour in the air. The hydrogen of the water vapour enters into chemical union with the carbon of the carbide to form the inflammable gas acetylene, which continues to escape into the air so long as any undecomposed carbide remains exposed to its influence; at the same time the oxygen of the water vapour combines with the calcium of the carbide to form calcium oxide, or quicklime, which in turn combines with a further quantity of atmospheric water vapour to form calcium hydrate or slaked lime.

When liquid water is poured upon calcium carbide, or the carbide is dropped into water, the same reactions occur as when the carbide is exposed to the atmosphere, but they take place at such a rapid rate that the decomposing carbide becomes more or less strongly heated, and acetylene gas is evolved in a brisk stream.

Absolutely pure calcium carbide will yield 5·82 cubic feet of acetylene per pound of carbide decomposed, but with commercial carbide of good quality the average yield of acetylene does not exceed 5 cubic feet per pound, and with inferior carbide or with generators of an inferior type the yield often falls considerably below this volume.

Moissan has shown that pure calcium carbide is white and transparent, but the carbide of commerce is neither pure, transparent, nor white. Commercial calcium carbide is usually either a dense agglomeration of opaque iridescent crystals, or a compact semi-crystalline mass of bluish-grey or grey-black colour. It has a semi-metallic appearance and resembles granite in hardness. Its density is 2·22. The difference in the physical condition of different samples of commercial carbide is caused by variations in its rate of cooling from the fused state in which it is formed in the furnace, and also by variations in the nature and quantity of the impurities present. Comparatively large crystals are formed when the carbide cools slowly, and small crystals when it cools rapidly. The colours are mainly due to the presence of iron as an impurity in the raw materials employed. Black particles of carbon which have not united with calcium to form carbide are also frequently present. No reliable indication regarding the purity of carbide is afforded either by its colour or by the size of its crystals.

The Electric Arc.—If a wire through which a strong electric current is passing be severed, and the severed ends remain within a short distance of one another, the current will leap across the space by which they are separated, and its passage will be accompanied with the evolution of light. If a rod or pencil of carbon be attached to each of the ends formed by severing the wire, and the tips of the two pencils be brought in contact and then drawn a short distance apart a dazzling light will be at once emitted. The evolution of light is due partly to the ends of the carbon pencils becoming incandescent, partly to the electric arc which is produced as the electric current leaps from one carbon pencil to the other, and partly to small particles of carbon which flow with the current from one pencil towards the other, and which become heated to incandescence in the arc. The end of the positive carbon emits a more brilliant light than the end of the negative carbon, and after a short period it becomes slightly flattened and has a small hollow or "crater" formed in it. It is from this crater that the whitest and most intense light is emitted.

The appearance of the electric arc and carbon pencils is shown in fig. 53, which is reproduced from a photograph for the use of which the writer is indebted to Professor Vivian B. Lewes, and it will be seen that while the positive pole becomes flattened, the negative pole becomes more pointed.

When the ends of the carbons are too close together a hissing noise is produced, and if they are a little too far apart a roaring noise is

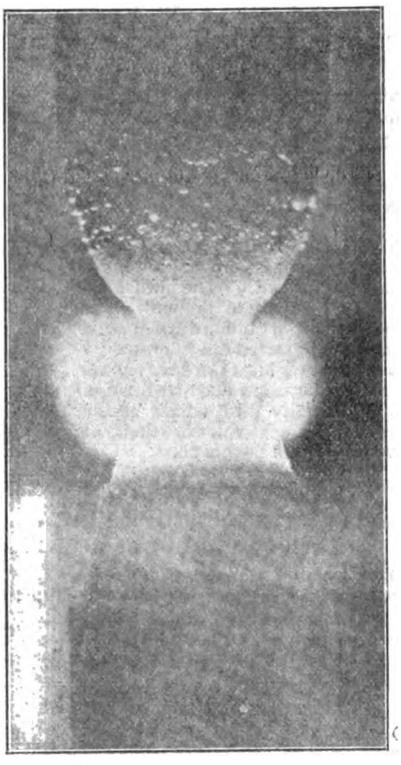

Fig. 53.—The Electric Arc.

emitted and the evolution of light is apt to suddenly cease, owing to the failure of the current to effect a junction between the two carbons. When the carbons are a suitable distance apart the combustion of the carbons

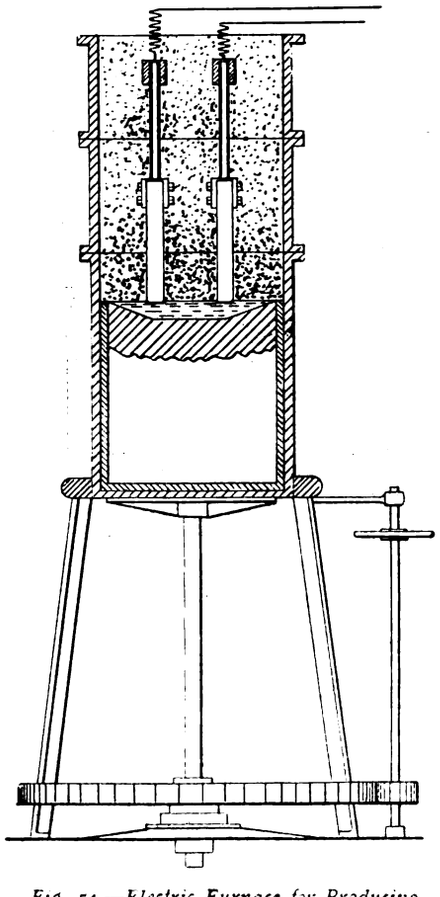

Fig. 54.—Electric Furnace for Producing Calcium Carbide.

and the passage of the current should proceed silently, and be accompanied by the evolution of a brilliant and steady light. The value of the electric arc for the manufacture of calcium carbide is, however, not due to the evolution of light nor to any influence peculiar to electricity, but merely to the fact that the temperature of the arc is much higher than that obtainable by any other known means.

Electric Furnaces.—The temperature of the electric arc has been found by experiment to be 3,500 deg. C., and by enclosing it in a chamber having infusible non-conducting walls the useful appliance known as an electric furnace is constructed. Electric furnaces have been employed for scientific research work for a long period, but it is only within the last quarter of a century that they have become of great industrial value. Lewes divides electric furnaces into two classes:—

1. Those in which the substance to be heated is placed in the path of the electric arc, or is made to form one or both poles for the formation of the arc, and

2. Those in which the heat is generated by offering resistance to the flow of current, as when a piece of thin platinum wire is heated to incandescence by making it the link between two copper wires of greater diameter through which the current is passing.

For the manufacture of calcium carbide on a large scale, furnaces of the arc type are always employed. It would serve no useful purpose to describe each of the numerous designs for electric furnaces which have been patented for the manufacture of carbide, and a brief description of one of the arc furnaces (fig. 54) recently invented by W. S. Horry, of Niagara, must serve as a type of carbide furnaces in general, but further information relating to calcium carbide and the various furnaces which have been employed for its manufacture can be obtained by reference to Professor Lewes' exhaustive treatise on acetylene.

In the Horry furnace (fig. 54) the carbon pencils are placed in parallel vertical position, and are buried in the mixture of lime and carbon to be converted into calcium carbide. When the arc is produced between the lower ends of the two pencils the mixture in the neighbourhood of the arc fuses and is converted into a pool of liquid carbide. A portion of the superimposed mixture then falls into the liquid carbide, which spreads laterally until it passes beyond the field of reduction and solidifies. That portion of the solid mixture which has fallen into the molten carbide is acted upon by the electric arc, and is itself speedily converted into molten carbide. In this manner all the mixture in the lower part of the furnace is gradually converted into carbide. In order to bring the upper layers of mixture into the field of the arc, mechanism is provided whereby the furnace may be moved vertically downwards, so that the carbon pencils, which remain in a fixed position, may occupy a higher position in the furnace.

The chemical name for quicklime is calcium oxide, and when a mixture of ground coke and lime is subjected to the heat of the electric arc the carbon contained in the coke and the calcium contained in the lime enter into chemical combination to form calcium carbide, thus:—

CaO	+	$3C$	=	CaC_2	+	CO
Quicklime	+	carbon	yield	calcium carbide	+	carbon monoxide

The foregoing chemical equation shows that, theoretically, 56 parts by weight of quicklime will combine with 36 parts of carbon to produce 64 parts of calcium carbide and 28 parts of carbon monoxide. The carbon monoxide is a poisonous, inflammable gas, which burns at the mouth of the furnace, or may be utilised to assist in maintaining the high temperature of the furnace. In practice the lime and the carbon employed are never pure, and it is necessary to ascertain the proportion of the impurities present in them by chemical analysis, and to make allowance for them when calculating the relative proportions of lime and coke to be employed in the mixture to be converted into calcium carbide.

There are two forms of carbide on the market, known respectively as "ingot" carbide and "run" carbide.

Ingot Carbide.—When powdered lime and coke, mixed in the correct proportions for carbide manufacture, are heaped around the carbon poles in an electric furnace, that part of the mixture which is in closest proximity to the electric arc fuses and becomes converted into calcium carbide, but the outer portion of the mixture is not heated to a sufficiently high temperature for conversion into carbide. When the electric current is cut off and the material within the furnace is allowed to cool, the whole of it is found to have become conglomerated

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into one compact mass or "ingot," consisting of a core of high-quality calcium carbide with a crust which contains less and less carbide as its distance from the core increases.

The entire ingot as it leaves the furnace contains about two-thirds of its weight of commercially pure calcium carbide, while the remaining one-third consists of "crust," and contains a large proportion of lime and carbon which have escaped conversion into calcium carbide. When the ingot is broken into small lumps for distribution to consumers the worst portions of the "crust" are picked out, but a considerable amount of material, consisting partly of carbide and partly of useless lime and carbon mixture, is blended with the purer carbide. Occasionally a sample of carbide, consisting mainly of "crust" and yielding only about one-half of the normal quantity of acetylene, is found on the market.

Run Carbide.—If an excess of lime be added to the carbon and lime mixture to be converted into carbide, the additional lime acts as a flux, and renders it possible to convert the whole mixture into a molten mass, which may be run out of the furnace into suitable moulds. When producing ingot carbide the temperature of the furnace becomes so high that the furnace lining is rapidly destroyed, and it is found that by using an excess of lime and producing run carbide the destruction of the furnace lining is less rapid. Run carbide is more uniform in composition than ingot carbide, but as it contains an excess of lime it will not yield so large a volume of acetylene as the best selected ingot carbide. When, however, the crust obtained with ingot carbide is mixed with the core of the ingot the mixture may be of less value than run carbide. Every consumer who uses carbide in considerable quantity should provide himself with some means of ascertaining the volume of acetylene evolved from a definite weight of the carbide supplied to him, and should insist that the price of the carbide be regulated by its quality.

Protective Coverings for Carbide. — Many attempts have been made to protect carbide from the influence of atmospheric water vapour without interfering with its utility for the production of acetylene by contact with liquid water. The carbide has been soaked in glucose, which was intended to provide a coat which would be impervious to the atmosphere, but which would dissolve as soon as the carbide was immersed in water. The carbide has also been treated with liquid petroleum, paraffin-wax, tallow, and other substances of a like nature, the object in some cases being merely to retard the rate of evolution of the gas when the carbide was brought in contact with water. In other cases the carbide has been sealed in metal cartridges to be dropped into the water and then perforated with a suitable pointed tool.

The steeping of carbide in glucose, oil, or wax does not protect it efficiently from the action of atmospheric water vapour, for if a sample of carbide so treated be exposed to the air for a week, it will be found to be more or less completely decomposed. The sealing of the carbide in metal cartridges is not convenient when the gas has to be generated in comparatively large quantities, and the preservation of the raw carbide in stout metal drums with air-tight lids remains the best and safest method of storage.

OBITUARY.

MR. F. WILD.—The death is announced of Mr. Fred Wild, architect, of Bradford, which occurred at his residence, Farcliffe Place. The deceased, who was a native of Halifax, came to Bradford with his father in early youth, and was articled to Mr. Samuel Jackson, J.P. Among the local buildings of which he has been the architect is the Bradford Conditioning House, in course of erection; the East Ward Conservative Club; and the caretaker's lodge at Chellow Heights. Mr. Wild was a bachelor, and was forty-nine years of age.

THE CENTRAL LONDON RAILWAY (NEW LINES).—The company have prepared a Bill for powers to construct a line which will in effect complete the circle, or rather oval, of their present railway and enable them to run the trains continuously. The new line from Shepherd's Bush is planned to take a route to Old Broad-street by way of Kensington, Knightsbridge, Piccadilly, the Strand, Ludgate-hill, Queen Victoria-street, and Leadenhall-street, with two subways—one from Surrey-street, Strand, to Victoria Embankment, the other from Bennet's-hill to Paul's Stairs by the riverside.

GENERAL BUILDING NEWS.

ST. OSWALD'S, METHLEY, LEEDS.—This church was reopened on October 26, after the partial completion of very extensive repairs. The whole building, constructed of Oulton stone, has suffered so much from weather, smoke, and perhaps chemicals, that most of the old surface had perished entirely, in many places to a depth of 7 in. or 8 in. The parapets had mouldered away, the buttresses in some cases had separated from the walls, and the spire was dangerous. To a great extent the church has now been repaired with hard Derbyshire stone, the spire was taken down and rebuilt, the tower made good, and the surface of the walling on the south side attended to, an open drain being formed all round the building. Inside, the church has many features of interest, including one very fine window of fifteenth-century glass, and a good screen of the same date. Foundations of a Saxon building were discovered across the west bay of the nave, part of the north wall being supported on them. Plain floors of red squares and black and white marble have been laid down, new oak choir-stalls erected, and the old seats refixed. Two arches open into the temporary organ-chamber. The seventeenth-century pulpit and font-canopy are repaired, and the lectern (of German design) cleaned from varnish. A figure of St. Oswald which was over the south porch door has been brought into the church as it was perishing; also two effigies, which stood in the north porch, have been once more made recumbent in openings prepared for them in the walls, strips of copper recording their "translation" in the following words:—

RECTORIS IGNOTI EFFIGIEM SUCCESSOR HIC PONI CURAVIT. MDCCCCI.

SERVUM TUUM NOBIS IGNOTUM DOMINE CUSTODI.

The lower part of the walls, disencumbered of thick modern plastering, displayed in places some interesting paintings, but most of the original surface had been hacked away. The Jacobean altar is kept in use, surmounted by a large red marble slab. Much remains to be done, especially on the north side, before the church is once more weatherproof. The architects are Messrs. Prothero & Phillott, of Cheltenham, and the builders Messrs. Collins & Godfrey, of Tewkesbury.

CHURCH, ILFRACOMBE.—A new church is to be built at Ilfracombe on the site of the present St. Peter's. Mr. G. H. Fellowes Prynne, of London, is the architect.

PRESBYTERIAN CHURCH, STANLEY, DURHAM.—The foundation-stones of a new Presbyterian church at Stanley, county Durham, have just been laid. The buildings are being erected from the design and under the superintendence of Messrs. Badenoch & Bruce, architects, Newcastle-on-Tyne, and comprise a church to seat 350, hall seated for 230, with vestry, class, and session-rooms. The walls are of local stone, with hammer-dressed facing, and having chiselled dressings. The site is on the brow of the hill to the east of Stanley, and on the north side of the main road from Shield-row. The church is planned with wide nave and no aisles, and has vestibule porch at entrance, with tower and spire. The hall and classrooms are at the east end, and the hall gable abuts on the main road, with the porch at one side giving access to same, and answering as an exit from the church. The timber work throughout will be of pitch pine, stained, and the floors will be in wood blocks laid on concrete. The contractors are: Wm. Johnson, White-le-head, mason; John Anderson, joiner and slater; Matthew Charlton, plumber; Richard Frankland, Blackhill, plasterer; Adam Robertson & Sons, painters and glaziers; and heating, Messrs. Emley & Sons, Ltd., all of Newcastle, except the mason and plasterer.

CHAPEL, PANBRIDE, FORFARSHIRE.—St. Bride's Chapel was opened on the 12th inst. The chapel accommodates 404 persons, and is situated at the intersection of Carlogie-road and Maule-street. It consists of a nave and side aisle with raised chancel at the east end, from which an organ-chamber is divided by an arch. At the west end there is a font recess, with dressed stonework and tiled walls and floor. The roof is of open timber work, and the aisle is divided from the nave by wooden pillars and trussed timbering. The architects were Messrs. James Maclaren & Sons, Dundee, whose design was chosen in competition.

STORES, YORK.—A branch of the York Equitable Industrial Society, Limited, has just been opened at the corner of Vyner-street and Haxby-road. Mr. Beck was the architect.

FACTORY, BRISTOL.—A new factory for Messrs. Pearson, Huggins, & Co. has just been built on a corner site at the junction of Mivart-street and Cato-street, Eastville. The area of the floor space available is slightly over an acre, and at least 1,000 workers will be employed. In the basement is a fireproof storeroom, which is lighted by Luxfer prism windows. There is a lift from this store to the other floors. The ground, first, and second floors will be used for the making, finishing, and packing of the army, railway, police, and tramway clothing. The whole premises are lighted by electricity and warmed by hot water, the apparatus for the latter being supplied by Skinner & Co. The contractor for the general work is Mr. Longden, of Eastville, and the architects are Messrs. La Trobe & Weston.

BUSINESS PREMISES, ABERDEEN.—Work in connexion with the suite of new offices at Broadford Works, Aberdeen, for Messrs. Richards, Ltd., is now nearing completion. The new building, which is 112 ft. in length, is erected on the site of the old offices, which were found to be insanitary and unsuitable for the business. Plans for the new premises were prepared by Mr. R. G. Wilson, architect, Aberdeen. The accommodation consists of a manager's and board room (in which the meetings of the directors will be held), an assistant manager's room, a counting-house (33 ft. in length by 30 ft. in breadth, occupying a central position), a room for the typists, and a large office, with gatekeeper's premises, waiting-rooms, and lavatories. There are three built safes in connexion with the different departments of the work, and also a large safe on the basement floor underneath the counting-house for the storage of books and papers. A central hall running throughout the building gives access to the various rooms.

NEW BUILDINGS, EDINBURGH CASTLE.—The finished drawings of the new buildings which are to be erected in Edinburgh Castle are now on view to the public in one of the committee-rooms of the City Chambers. They have been prepared at the War Office under Major Hemming, R.E., and show a building of the Castellated or Scottish Baronial style of architecture, providing officers' messroom accommodation and quarters for seventeen officers and their servants. The new structure, which is 124 ft. long and 100 ft deep, is for the most part two stories in height, but the fall in the ground at the north side is utilised for the kitchen, cellars, offices, and servants' quarters, and that part of the building is thereby increased to four stories. The site is on the old Mills Mount, to the immediate east of the recently-erected military hospital, and the barracks now occupying the site will be demolished to make way for the new quarters, the design of which is in harmony with the architectural features of the existing building. On entering the Castle, the new building will be to the right, after passing the Argyle battery. The ground floor, which is entered through a vestibule and hall—in which there is a recess for the band—will contain the principal apartments, including mess-room, ante-room, billiard-room, and the usual mess offices, which communicate with the kitchen by a separate staircase and lift. On the north side of the entrance are suites of rooms for two field officers, one on the ground floor and the other on the upper flat, with separate entrances, and the rest of the building is devoted to bedroom accommodation. In front of the mess there is a terrace, with a stone parapet, and on the north side a spacious flat over the billiard-room commands a view of Princes-street and the Fife coast. The contracts have not yet been let, but it is understood that they will be placed with local firms, and the probable cost is estimated at about 20,000*l.*—*Scotsman.*

NEW LIBRARY FOR LEWISHAM.—On the 23rd inst., Mr. T. W. Williams, Mayor of Lewisham, opened to the public a new central public library, which has been erected in the High-street, Lewisham, close to the parish church, at a cost of nearly 8,000*l.* The building is in the Renaissance style, and is built of red brick, with terra-cotta dressings, from the designs of Mr. A. R. Hennell. The builders were Messrs. Black & Son, of Forest Hill. In the hall is a bronze tablet to the memory of Alfred the Great.

WORKHOUSE, WORMWOOD SCRUBBS.—An ordinary fortnightly meeting of Hammersmith Board of Guardians was held on the 20th inst., at the Guardians' offices, Fulham Palace-road, when it was stated that the Building Committee had considered the Board's reference of the question of the formal appointment of Messrs. Giles, Gough, & Trollope as architects in connexion with the erection of the new workhouse and infirmary at Wormwood Scrubbs. Having had an interview with representatives of the firm, the Committee recommend that Messrs. Giles, Gough, & Trollope be appointed as the architects. To this the Board agreed.

NEW FIRE-STATION, BARNSLEY, YORKSHIRE.—An inquiry was held at the Town Hall, Barnsley, on the 21st inst., by Mr. A. A. G. Malet, M.I.C.E., an Inspector of the Local Government Board, into a proposal of the Town Council to borrow 1,800*l.* for a new fire-station and firemen's houses, and 408*l.* for the improvement of the road at Shaw-lane. The Borough Surveyor, Mr. J. H. Taylor, explained what was proposed.

SANITARY AND ENGINEERING NEWS.

ELECTRIC LIFTS FOR GREENWICH FOOTWAY TUNNEL.—There will be two electric lifts, one at each end of the tunnel, each of which will be capable of carrying about seventy passengers at a speed of 180 ft. per minute. The lifts will travel about 44 ft. and 50 ft. respectively. In order to reduce the current required, the cage and half its load will be balanced by a cast-iron weight. The cages will be of strong construction, having steel suspension frames with the lower parts filled with panelling of contrasted woods. The upper half will be finished with ornamental ironwork. Each cage will be fitted with automatic safety gear arranged to stop the car if the speed exceeds a fixed limit. The cages (and balance weights) will

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run on steel rails milled to gauge to ensure easy running. Each car will be suspended by eight flexible steel wire ropes, the ultimate strength of all the ropes being twenty times the maximum load that they have to carry. The driving gears will be made to Björnstad's patents and fixed overhead, so that only three pulleys are required for each. The motors actuate the driving pulleys through worm gear. The worms will be of mild steel gearing with phosphor bronze wheels with machine-cut teeth and enclosed in oil baths. The controlling gears are constructed under Björnstad's patents, all the switches required for starting and stopping the motors being actuated by powerful magnets, which are controlled by the attendant in the cage through a small switch. Messrs. Easton & Co. are the engineers.

THE MANCHESTER WATER SUPPLY.—The Manchester Waterworks Committee met on the 21st inst., and decided to remove all restrictions upon the water supply under their control. The effect of recent heavy rains has been, not indeed to fill the reservoirs at Longdendale, but so far to fill them as to make the question of a water famine rather remote. The Committee, having dealt with the question of the immediate supply of water, next turned their attention to the question of the laying of the second pipe from Thirlmere, and it was decided that tenders for laying the first section, namely, that between Prestwich and Hoghton, near Blackburn, be advertised for. There will be fourteen miles of cast-iron pipes 44 in. in diameter, and ten miles of similar pipes 40 in. in diameter, with three-quarters of a mile of steel pipes to be used in carrying the line over bridges. The use of steel pipes for this purpose is at present purely experimental, and they are therefore to be placed in such a position as shall be easily accessible. The Committee have not at present absolute faith in this, fearing that the steel pipes will be more liable to corrosion than pipes made of cast-iron. It is for this reason that steel pipes are only to be brought into requisition to such a limited extent.—*Manchester Guardian*.

FOREIGN.

FRANCE.—A historical exhibition of wood-engraving is to be held at the Ecole des Beaux-Arts during this winter. It is to include examples of French and foreign wood-engraving from the commencement of the art to the end of the nineteenth century.——An exhibition of the ceramic work of M. Lachenal is open at the George Petit Gallery, Paris. It includes a great deal of fine work in stone-ware, faïence, and enamel.——The "Alliance Provinciale des Industries d'Art" has decided on the formation, at Nancy, of a school of theoretic and practical instruction in applied art, to include wood-carving, metal-work, textile art, ceramic art, and other artistic industries.——M. Ch. Gozier, architect, of Rheims, has been elected President, for 1902-3, of the Société des Architects of the Marne; and M. Etève has been elected President of the Société at Nantes, for the same period.——The decorative panels executed by M. Cheret for the Hôtel de Ville of Paris, and which represent Pantomime, Dancing, Comedy and Music, are about to be placed in position. They will be framed in white wood borders picked out with gold. The scheme of decoration will be completed by four smaller panels over the doorways, consisting of figures of children and various symbolic attributes.——The death is announced, at the age of sixty, of M. Paul Emile Sautai, painter, and pupil of Jules Lefebvre and of Robert-Fleury. He was a painter of landscape and *genre* pictures many of which have found places in provincial art museums, and in the Luxembourg are his two pictures "Interior de l'Eglise de Lavardin," and "Souvenir de Rome." He had received medals in various successive Salons.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. C. J. Innocent, architect, of Sheffield, has taken into partnership his son, Mr. Charles Frederick Innocent, who is an Associate of the Institute of British Architects.——Messrs. Mansell & Mansell, architects (Birmingham), have removed from Imperial Chambers, Colmore-row, to No 47, Temple-row, Birmingham.——Mr. Joseph Berry, architect (Huddersfield), has removed his offices to 3, Market-place, Huddersfield.——Messrs. Denny, Mott, & Dickson (London) have been appointed sole agents in Great Britain for compo-board.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—The usual fortnightly meeting of this Society was held on Friday, the 22nd inst., Mr. James McKissack in the chair, when a paper entitled "Foreign Competition in the Building Trades" was read by Mr Geo. Herbertson, measurer. He held that the restriction put by the combined action of workmen on the importation of foreign-made joinery finishings and the like was contrary to the spirit of free trade, which is the policy of this country. He suggested that for rolled steel beams and Portland cement a certain standard should be specified, and let the material come from where it might. He deprecated the proposed boycotting by slate quarry masters in their attempt to keep out foreign slates. A discussion followed. On Saturday, the 23rd inst., the members of the Society visited the lodging for men known as "Whitehouse," situated at Springburn. The promoters, a syndicate under the name of "The St. Mungo Boarding House Company," are to be congratulated on their very effective solution of the problem of providing home comforts for the working classes in an establishment, palatial in its construction, and such as to promote the health and happiness of its inmates, at a cost which must be considered to be extremely reasonable. The idea of the management is not so much to cater for the single-night lodgers as to provide for permanent or weekly boarders. For the modest sum of 13s. 6d. per week a working man has his breakfast, dinner, tea, and supper served in a dining-room, large, airy, and well lit, on tables laid with spotless tablecloths, and waited on by civil attendants. His evenings, if he be of a literary turn, he can spend profitably in the library. The buildings reflect credit on the architect, Mr. Whitey, of Glasgow, treated as they are in an artistic fashion combined with strict economy in their design. The walls are constructed of brick, rough-cast cement on face, with red-tinted cement as dressings. The floors are fireproof, and the buildings are lighted throughout by electric light. Steam is employed in the cooking arrangements, and the laundry work and cleaning is accomplished by the most improved machinery.

THE CARPENTERS' COMPANY'S EXAMINATIONS.—This Company held their annual examination in sanitary building construction at their Hall during last week. The Board of Examiners included Professors T. Roger Smith and H. Robinson; Mr. John Willson, the Master of the Company; Mr. Slater, Vice-President of the Institute of Architects; Mr. Seth-Smith, President of the Architectural Association; Dr. Wynter Blyth, Medical Officer of Health of Marylebone; Mr. Chas. Wall, President of the Institute of Builders; Mr. Bartlett, of King's College; and Mr. S. Green, President of the Clerk of Works' Association. The following is a list of successful candidates arranged in order of merit: F. Hartnoll, special prize of books (as he already holds the Company's silver medal); H. Barsby and H. German (equal), silver medals; G. H. Lovegrove, E. W. F. Martin, and A. Norton (equal), bronze medals; H. Walker, H. Bolton, J. Sandham, C. W. Woodhouse, A. B. Harvey, E. A. Crane, G. J. Boog, J. Lawrence, and W. M. Couper, certificates.

APPOINTMENT OF SANITARY OFFICER.—The Local Government Board has sanctioned the appointment of Mr. H E. Cox as a sanitary inspector in Stoke Newington.

SCHOOL OF ART WOOD-CARVING.—The School of Art Wood-carving, Imperial Institute, South Kensington, has been reopened after the usual vacation, and we are requested to state that some of the free studentships, maintained by means of funds granted to the school by the Technical Education Board of the London County Council and by the Drapers' Company, are vacant. The evening class is, for the present, closed, but to meet the requirements of those professionally engaged during the week, a special Saturday afternoon class is held. Forms of application for the free studentships and any further particulars relating to the school may be obtained from the manager.

INCORPORATED CHURCH-BUILDING SOCIETY.—This Society held its usual monthly meeting (the first of the present session) on Thursday, Nov. 21, at the Society's House, 7, Dean's-yard, Westminster, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building a new church at Stoughton, Emmanuel, near Guildford, 50*l*. for the first portion, and towards enlarging or otherwise improving the accommodation in the churches at East Bridgford, St. Peter, near Nottingham, 25*l*.; Hednesford, St. Peter, near Stafford, 70*l*.; Ickham, St. John the Evangelist, near Dover, 25*l*.; Manningtree, St. Michael and All Angels', Essex, 25*l*.; Tetbury, St. Mary, Gloucester, 20*l*., in lieu of former grant of 10*l*.; West Dereham, St. Andrew, Norfolk, 25*l*.; Weston-super-Mare, St. Saviour, Somerset, 60*l*.; and Worlington, All Saints', Suffolk, 25*l*. Grants were also made from the special Mission Buildings Fund towards building Mission churches at Eastcombe, near Stroud, Gloucester, 15*l*.; New Catton, St. Luke, Norwich, 30*l*.; Newton, near Burton, Pembroke, 20*l*.; and Steelworks, near Ebbw Vale, Monmouth, 20*l*. The following grants were also paid for works completed:—Roath, St. Martin, Cardiff, 1,000*l*.; Grove, St. James, Wantage, Berks, 50*l*.; Woolmer Green, St. Michael and All Angels', Welwyn, Herts, 80*l*.; Little Bowden, St. Nicholas, Northampton, 35*l*.; Great Saughall, All Saints', Chester, 50*l*.; Heysham, St. John, Lancaster, 150*l*.; Worlington, All Saints', Suffolk, 15*l*.; Greenhead, St. Cuthbert, Carlisle, 30*l*.; Croydon, St. Augustine, Surrey, 150*l*.; Stow Longa, St. Botolph, near St. Neots, Hunts, 25*l*.; Compton Dundon, St. Andrew, Somerton, Somerset, 25*l*., Hetton-le-Hole, St. Nicholas, Durham, 100*l*.; South Witham, St. John the Baptist, Grantham, Lincs, 25*l*; Sidcup, St John the Evangelist, Kent, 100*l*.; Thaxted, St. John the Baptist, Essex, 20*l*; Pontardulais, St. Michael and All Angels', Glamorgan, 110*l*.; Wetley Rocks, St. John, Stoke-on-Trent, 20*l*.; Latchford, St. Hilda, Warrington, 15*l*.; Leyton, St. Luke, Essex, 20*l*.; Willesden, St. John the Baptist, Middlesex, 50*l*. Dundraw Mission Church, Bromfield, Cumberland, 15*l*.; Cotteridge Mission Church, near Birmingham, 50*l*.; Stoke Newington, St. Faith, London, 35*l*.; Chapel St. Leonards, St. Leonard, Alford, Lincs, 15*l*.; Stirchley-street, The Ascension, near Birmingham, 200*l*.; Noman's Heath, St. Mary the Virgin, Tamworth, Staffs, 10*l*.; and Wendlebury, St. Giles', Oxon, 20*l*. on account of a grant of 25*l*. In addition to this the sum of 466*l*. was paid towards the repairs of twenty-seven churches.

ELECTRIC LIGHT POWER STATION, NEEPSEND, SHEFFIELD.—Mr. A. A. G. Malet, A.M.Inst.C.E., inspector under the Local Government Board, sat at Sheffield Town Hall on the 19th inst. to inquire into the subject-matter of the application of the Sheffield City Council for sanction to borrow 500,000*l*. for purposes of the electric lighting undertaking. Mr. S. E. Fedden is the electric light engineer.

CAPITAL AND LABOUR.

MILL-SAWYERS AND WOOD-CUTTING MACHINISTS RULES.—The following are the new working rules which have been agreed upon between the representatives of the London Master Builders' Association and the Amalgamated Society of Mill-Sawyers and Wood-cutting Machinists:—1. That the working hours in summer shall be fifty per week for forty weeks. That during twelve weeks of winter, commencing on the second Monday in November, the working hours shall be for the first three weeks and the last three weeks forty-seven hours per week, and during the six middle weeks forty-four hours per week. *Summer* (for forty weeks).—First five days of each week, 6.30 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 1 p.m. to 5 p.m. Saturdays, 6.30 a.m. to 8 a.m., 8.30 a.m. to 12 noon (equal to fifty hours per week). *Winter* (for twelve weeks).—For three weeks commencing the second Monday in November: First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 1 p.m. to 5 p.m.; Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon (equal to forty-seven hours per week). For the next six weeks: First five days of each week, 8 a.m. to 12 noon, 1 p.m. to 5 p.m.; Saturdays, 8 a.m. to 12 noon (equal to forty-four hours per week). For the following three weeks: First five days of each week, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon, 1 p.m. to 5 p.m.; Saturdays, 7 a.m. to 8 a.m., 8.30 a.m. to 12 noon (equal to forty-seven hours per week)

2. That overtime, when worked at the request of employers, but not otherwise, shall be paid at the following rates, namely:—from leaving-off time until 6 p.m., ordinary rate; from 6 p.m. to 10 p.m., time and a quarter; after 10 p.m, double time. On Saturday the pay for overtime, from noon to 4 p.m., shall be time and a half; after 4 p.m., and Sunday, double time. Christmas Day shall be paid for the same as Sunday.—3. That one hour's notice be given or one hour's time be paid by either side, on determining an engagement.—4. That payment of wages shall commence at noon, or as soon thereafter as practicable, on Saturday.—5. That wages earned after leaving-off time on Friday, and Saturday only, shall be kept in hand as back time.—6. That the term "London District" shall mean twelve miles radius from Charing Cross.—7. Conciliation Rule.—(*a*) For the adjustment of all disputes and to avoid stoppage of work, it is agreed that upon a difference arising between an employer or upon the works of an employer and any of his workmen from any cause whatever, notice shall be given by the association or society of the complaining party to the association or party representing the other side, and the subject matter of dispute shall thereupon be referred to the Board of Conciliation, who shall be summoned within seven days, and, if practicable, shall give their decision within the next six working days, proceeding in the following manner: (*b*) For all purposes of the foregoing rules the Board of Conciliation shall consist of three members nominated by the employers and three by the workmen. Each party shall send to the other within one week from the date of signing these rules, and within one week from January 1 in each year, the names of six persons from whom three shall be selected to act as their representatives on the Board of Conciliation for the current year ending December 31, and in the event of the death or resignation of any member, either party shall appoint another member within one week, notice being given thereof. The number of representatives of the employers and of the workmen on the Conciliation Board shall always be equal and shall be so maintained during the sitting. (*c*) The Board of Conciliation so constituted, if unable to agree, shall make application to the Board of Trade under the "Conciliation Act, 1896," or apply for the appointment of a person to act as a conciliator. The Board of Conciliation shall have power to decide all questions arising between the employer and the workmen, including any questions between one trade and another as regards demarcation of labour or other matters, provided that for the decision of any question involving claims or rights of other sections of the building trades a Joint Conciliation Board shall be constituted of the three representatives nominated by each trade involved and by a similar number of representatives of the employers, so that members on the Joint Conciliation Board may be specially represented on such Board, and so that the numbers of representatives

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of the employers and the workmen on such Joint Conciliation Board shall be equal and be so maintained during the sitting. (*d*) A Joint Conciliation Board shall have the like powers as a Conciliation Board, and be regulated in the same manner. (*e*) The Conciliation Board, or a Joint Conciliation Board, shall have power to make such rules and regulations for the transaction of business as they may approve. (*f*) In the event of an application being made to the Board of Trade, or a person being appointed as conciliator, the decision of such person or the Conciliation Board shall be final and binding on both parties. 8. That six months' notice on either side shall terminate the foregoing rules. (It is understood that the six months' notice shall not expire during the winter weeks.) Throughout the rules "employer" means a member of the London Master Builders' Association, and "workman" means a member of the Amalgamated Society of Mill-Sawyers and Wood-Cutting Machinists.

LEGAL.

A BUILDER'S APPEAL UNDER THE WORKMEN'S COMPENSATION ACT, 1897.

THE case of Veazey *v.* Chattle came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 23rd inst., on the appeal of the defendant (the employer) from an award of the County Court Judge of Derby, who had made an award in favour of the applicant under the Workmen's Compensation Act, 1897.

In this case the applicant was in the employ of the defendant, a builder, and met with an accident whilst doing some repairs to the roof of a house. It seemed that the applicant and another workman erected a ladder against the side of the building, and took what was called a "crawling-board" up the ladder for the purpose of doing the repairs. This board consisted of a plank 20 ft. in length and 10 in. wide, and it had nailed or screwed across it ridges of wood for the purpose of giving foothold to the man who was working on it, and at one end of the plank, on the underneath side, was another ridge for the purpose of hooking it over the ridge of the roof. The two men placed this board on the roof, but it was not in any way attached to the ladder. The applicant went up the board for the purpose of lifting the end of it over the ridge of the roof, the other man standing on the ladder and holding the board to keep it steady. Before the applicant had done what he intended doing the board slipped and the applicant fell and was injured. The County Court Judge found that the applicant was employed on, or in, or about a building which exceeded 30 ft. in height, and which was being repaired by means of a scaffolding within the meaning of the Act (Section 7), and awarded the applicant compensation. From this decision the employer now appealed, on the ground that the County Court Judge was wrong in holding that the ladder and "crawling-board" constituted a scaffolding within the meaning of the Act.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, said that the decision of the House of Lords in the case of Hoddinott *v.* Newton, Chambers, & Co. was clear authority for saying that that which would not ordinarily be called scaffolding might be scaffolding within the meaning of the Act. Was it possible to say as a matter of law that this arrangement could not be a scaffolding within the meaning of the Act? It seemed to his Lordship that it fulfilled the purpose for which it was used—viz., the repair of a building—as well as did the trestles and boards in the cases cited during the arguments. It was a platform which was used by a workman in order that he might get on with his work. It was a special contrivance such as was usually adopted for the purpose of allowing a workman to work safely in a position at a considerable height from the ground, and it afforded a means of supporting him for doing his work in the same way as the trestles and boards which had been held to be scaffolding. It seemed to his Lordship quite clear from the decisions of the House of Lords that a ladder might be scaffolding within the meaning of the Act. He thought that the arrangement in this case answered to the description of scaffolding, and that the County Court Judge had come to a proper conclusion on the matter, and that the appeal ought to be dismissed.

Lord Justice Mathew concurred.

Lord Justice Stirling, however, dissented. The question to be determined was whether the structure which was used in this case could in the language of Lord Brampton in the case of "Hoddinott *v.* Newton, Chambers & Co." be called scaffolding, or in the language of Lord Lindley, could fairly be called a scaffolding. To his mind it could not. It seemed to him to be a form of ladder, and when the accident happened the board had not been put in position. In his opinion, the combination could not either fairly or properly be called a scaffolding. He therefore thought that the appeal ought to be allowed.

By a majority of the Court, therefore, the appeal was dismissed, and the decision of the County Court Judge affirmed.

Mr. Ruegg, K.C., and Mr. Cranstoun appeared for the appellant (the employer), and Mr. Chester Jones for the applicant (the respondent on the appeal).

IMPORTANT CASE UNDER THE PUBLIC HEALTH ACT, 1875.

THE actions of Wigham, Richardson, & Co., Ltd., *v.* the Walker-on-Tyne Urban District Council and of the District Council against Wigham, Richardson, & Co. came before Mr. Justice Farwell in the Chancery Division on the 26th and 27th insts.

Mr. Cripps, K.C., Mr. Macmorran, K.C., and Mr. Gatey were counsel for the company; and Mr. Robson, K.C., and Mr. R. J. Parker for the Urban District Council. The case of the Council was given priority to by the Court.

Mr. Robson, in opening his case, said that his clients were the Urban District Council of Walker, in the county of Northumberland, and the defendants were manufacturers and engineers at Walker; and this action was brought under Section 26 of the Public Health Act, 1875, which enacted that any person who in any urban district without the written consent of the Urban Authority causes any building to be erected over any sewer of the Urban authority, or causes any vault, arch, or cellar to be newly built or constructed under the carriage-way of any street shall forfeit to the Urban Authority 5*l.*, and 40*s.* for every day after written notice has been given on behalf of the Urban Authority; and the Urban Authority may cause any building, vault, arch, or cellar constructed in contravention of this section to be altered, pulled down, or otherwise dealt with as they might think fit, and might recover the expenses of so doing. This was what the defendant company objected to, but the Council maintained that the company, having erected a vault, arch, or cellar, the Council were entitled to pull it down or dispose of it as they thought fit. The Council were also the public electric lighting authority. In April last it was reported to Mr. Laycock, the Council's Surveyor, that the defendants were building, without the consent of the Council, a tunnel under Fisher-street. The defendants' works were on both sides of that street, and they wanted the two sides connected for the purposes of their works. The Council were responsible not only for the sewers which they might hereafter lay down, but also for the electric lighting if they might wish to lay it down; and they did not wish a tunnel of 12 ft. high put down in this street which might interfere with their own operations hereafter. Notwithstanding that, the defendants persisted in continuing to construct this subway, and while the construction was going on subsidences of the roadway began to take place, and one of the water pipes was sprung, leaked, and the water began to wear away the soil from under the gas pipes. The Council said that this must not go on; and they claimed the right under the Statute to deal with the matter as they thought fit. But the plaintiffs went on with the work to carry their electric mains from one side to the other. Wigham, Richardson, & Co. were large shareholders in the Gas Co., who had powers to supply electrical energy outside this area. Within this area the legislature had given the Council powers to supply electrical energy, but Wigham, Richardson, & Co. took their electrical energy from the Gas Co. at present, and desired to have it extended to the other side of the street—both sides being within the Council's district. The Council submitted that although they could not prevent Wigham, Richardson, & Co. laying this tunnel under their own premises, they could prevent them constructing it under the public thoroughfare. The defendants had filled up the tunnel to some extent, and said that there was no longer a vault or tunnel under the street. But they had not removed the structure. On the contrary, they had left it more dangerous than ever, by filling up the space above the wires with ballast instead of concrete or material homogeneous with the surrounding soil or rock. The Council's Surveyor advised them that in consequence there would be a continuation of the subsidences, and that the Council would be unable to lay drains down this street.

Mr. Thos. Wm. Laycock, Surveyor to the Urban District Council, gave a description of the character of the tunnel or arch.

Mr. Cripps, for the company, said that after all they only wanted to get at the point of law. The Urban Council seemed to fear that they would lose for electric supply purposes the business of Wigham Richardson, & Co., whose works gave employment to over 3,000 persons. For those works the company wanted to get the polyphase system, and to do that they had to go under the highway; but, having had their attention drawn to the matter, they destroyed the arch, leaving the pipes or wires to pass through the concrete casing. All the District Council were entitled to under the statute was to get rid of the arch, but not to remove the electric wires. Yet they had proposed to dig down and cut those electric wires under the guise of filling up this arch; and against that Wigham, Richardson, & Co. got an interim injunction, as they had no right to cut this electrical connexion. While the company had been wrong in constructing an archway, and had admitted that, they were still entitled to restrain the District Council from taking up those mains, pipes, and electrical wires, which was now the only bone of contention.

After further argument, his Lordship, in giving judgment, said that the view he took of this case was that it turned on a question of fact, viz., whether the pipes in question were a structure or situated in any structure which the District Council were entitled to remove under Section 26 of the Public Health Act. The first action was by the Local Authority claiming a declaration in accordance with that section, and to that there was no defence at all, because nobody disputed that the Local Authority had that particular statutory right. But the company admitted that they brought a cross action to restrain the Local Authority from interfering with the pipes. The company were lessees of forty-four years unexpired of the land on both sides of Fisher-street. The subsoil of the street, therefore, at the *locus in quo* belonged to them. Wigham & Co., being owners on both sides of the street, were minded to take their electric cables from their property on one side to their property on the other. Had Wigham & Co., being owners, simply drilled a hole through the subsoil, and thrust a pipe through from one side to the other, there could have been no interference by the Local Authority. But they had built a tunnel with an arched roof and sides and floor of concrete. Such a structure required the written consent of the Urban Authority before it was built, and as it was not so obtained the Urban Authority had the right to have that structure removed. Having made that tunnel the company changed its plans, and instead of laying their pipes in the interior of that tunnel they cut away the centre of the concrete floor down to the clay and laid their pipes on the clay; and on the top of them the concrete was filled in again to the height of the original flooring. The Local Authority wanted to cut those wires on the ground that they were part of the floor of the arch, vault, or cellar, that they were entitled to remove the floor, and, inasmuch as these pipes were in or under the floor, they were entitled to remove the pipes also. In his lordship's judgment the place where the pipes were now laid was no part of the floor of the vault as built, and no part of a vault, arch, or cellar under the statute. The District Council succeeded in their claim for a declaration of their rights under the Section, and Wigham & Co. would have to pay the costs of that action. In the cross action, Wigham & Co. succeeded, and there would be an injunction to restrain the District Council from cutting, disturbing, or damaging the pipes or mains, the Council to pay the costs of that action.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

13,544.—CEILINGS AND FLOORS: *E. L. Ransome*—After a plastic or concrete ceiling has been moulded in place upon false work, the flooring is finished; short legs serve to sustain the core-boxes, which, until the cement has become set, are braced in position; then, when the boxes have been taken away, the floor is laid either over temporary frames or over permanent centres. For the metal coils (see No. 13,279 of 1900), which may join the parts as they are moulded in turn, the inventor substitutes hard porous earthenware or concrete blocks, laid over the webs and rebated to support the centres.

13,563.—A PRESSURE REGULATOR FOR GAS: *F. Ackermann*—A regulator for gas burners comprises a cylindrical case containing a cup fitted with a conical needle, as the gas raises the cup the needle tends to reduce in extent the gas-passage into the burner above, the cup being weighted to suit the normal pressure; a base-plate forced downwards with a helical spring may replace the cup.

13,591.—WINDING MACHINERY FOR LIFTING PURPOSES: *F. Eastmead and A. C. Moffatt.*—A lever that moves against a spring displaces lengthwise a shaft which carries a winding drum having conical ends. On the shaft runs loosely the driving wheel, which is prevented from moving sideways with a flange and a clip. On one side of the frame is affixed a brake-cup, and a brake-cup is fashioned on the pulley; when the spring comes into play, the drum is moved to engage with the brake, but when it is displaced towards the right-hand it will become engaged for winding with the pulley.

13,596.—SPIRIT AND OTHER LEVELS: *F. A. Brownell.*—Flanges are fashioned upon the outside and inside of the casing, which also has an internal screwed collar for pressing the container up against the cover. A small opening, to be closed with a screw, serves for the pouring in of the fluid.

13,602.—DECORATION OF CEILINGS, WALLS, AND SIMILAR SURFACES: *H. Schudt.*—Layers of quickly drying plastic material, wherein wire, string, shot, or other filling has been embedded, are brushed on the flat surface with long-haired brushes; the plastic material is compounded of glue, melted resin, and a paste of chalk and water, to which, when cool, are added oil and colouring-matter, and, it may be, lime, wax, or shellac. The process is described as being available for imitation leading on glass with coloured transfers, as an imitation of stained glass.

13,633.—FOLDING GATES AND GUARDS: *J. Judd.*—Gates and guards for shop-fronts, windows, &c., have uprights that are joined together with lattice-work in the form of lazy-tongs, and consist of two

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bars joined with pierced spacing-blocks which provide guides for the pins of lazy-tongs joints above and below. The amount of opening of the frame-work is regulated with pins or stop-blocks upon the end uprights, between which the lattice-bars are pivoted at the middle.

13,644.—A SOLDER FOR ALUMINIUM: *H. Lange.*—After the surfaces have been cleaned with a file they are coated with zinc as they are being heated, an alloy containing about one part of aluminium and two and a half parts of zinc is then spread over them and the surfaces, pressed together, are heated until the alloy is melted.

13,673.—A CONTRIVANCE FOR WINDOW-SASHES: *W. Cummings.*—For the turning inwards of sliding sashes a part of the inside bead is hinged, the parting is made detachable, and hinge eyes or sockets are either secured to the sashes for engagement with pivotted eyes, or fitted over pivots upon the frame. Bevelled pin-and-socket plates and a turn-buckle in engagement with a slotted plate on the bead, fasten the parting-bead, whilst a thumb-screw in a fixed threaded socket or nut secures the inside bead. For a lower-sash hinge is devised a T-shaped plate, upon the sash, having a lug and socket that will interlock with a flap which is pivotted on to the frame, and pivots upon the pulley-stile engage with socket-plates on the upper sash. A recess in the sash-stile contains a hook or button around which the sash-cord is looped, a fixed hook holds the detached cord when one turns the sash inwards.

13,694.—AN APPLIANCE FOR USE WITH DRAWING-SCALES: *E. L. Sykes.*—The inventor seeks to dispense with the use of compass dividers by fitting the drawing-scale with a movable pointer and a pointer fixed at one end of the scale.

13,703.—FLUSHING-APPARATUS: *R. Chantry & H. C. Milbank.*—Two tubes constitute a bell-siphon having its walls hollowed, a third tube is joined to the inner one of the two tubes, and is dipped into a stand-pipe. The third tube is also connected to a pipe at the base which leads into a cylinder containing a weighted piston; the piston, as it falls, causes the water to flow over the crown of the siphon whereby the flush is set in operation.

13,730.—CONTRIVANCE FOR HOISTING AND LOWERING PURPOSES: *R. Watson & C. E. Stevenson.*—A trolley, which carries the load, runs upon a rail which is to be raised upon a middle guide secured with brackets to the side of a building, when it has been lifted high enough the rail will form a connexion between fixed rails, on to which one can run the trolley; a spring-stop serves to prevent the trolley from running off too soon, and the winding-up of the rail too far is prevented with a lug that engages with the underside of the rail.

13,730.—AN APPLIANCE FOR DOORS, GATES, CASEMENTS, &C.: *D. Davis.*—A combined stop and holder consists of a curved metal plate, having its ends turned upwards, which is pivoted eccentrically and has an extension-piece for the control of its movement, the extension having a curved slot through which a pin is inserted. The edge of the door, as it is being opened, meets the end of the curved metal plate, and so turns the extension-piece into place for keeping the door opened between the ends of the plate.

13,750.—TILES FOR BUILDERS' USE: *F. Furness.*—Tiles for interlocking are fashioned with bevels so that they shall overlap with those next adjacent. They are bolted on to floors, walls, ceilings, and other surfaces, the bolts being fastened with screws and flanges, but for rubber tiles the bolt-heads are put into under-cut recesses. For the tiles see also No. 20,248 of 1894

13,755.—FLUSHING APPARATUS: *W. Müller.*—Between a flange and lugs upon the bell is mounted a loose plate. As the bell rises the water will flow to beneath the plate through openings that are made in the bell between the lugs and the flange The flush is started by the flowing of water over the crown of the siphon together with the fall of the loose plate.

13,793.—CONSTRUCTION OF CONCRETE WALLS, &C.: *E. L. Ransome.*—For adjusting mould boards or panels to the plumb-line are employed screws that will press against wedge-shaped or rebated braces, the panels, or cleats upon the boards, tie-bolts being passed through the boards and braces. Between the upper edges of the boards are inserted struts or distance-pieces, and on the outer sides of the adjacent boards are fitted turn-buttons that are pivoted to the boards.

13,796.—MEANS OF REGULATING WATER SUPPLY: *S. M. Rutnagur.*—For regulating the quantity of water delivered for flushing and other household or similar purposes, and for preventing waste, the inventor devises a screw-down or plug-valve, which is either closed automatically with a tippler or opened and shut with a handle. An outlet from the container communicates with a vessel fitted with an ordinary exit branch, and another that feeds water to the tippler, of which, when the valve is open, a weighted part will lie against a stop. The valve, when left opened, will become automatically closed after a certain known quantity of water has been supplied. For a spring push-valve an eccentrical disc for working the push is mounted upon the spindle.

13,805.—INSULATORS, &C., FOR ELECTRICAL CONDUCTORS: *G. Wright and C. Aalborg.*—The supports and insulators are more particularly intended for telephone switch-boards. They are made with central openings and annular recesses and projections, so that one can apply them to a bolt. When two insulators are put side by side lateral grooves maintain the conductors in their places, and bosses upon the brackets fit into the insulators beneath.

13,817.—A CALCULATING MACHINE: *J. Vermehren.*—The instrument is intended for the processes of multiplication, division, squaring, and calculating by means of logarithms. Two discs and two operating counters, which are carried by screw-threaded or lengthwise-adjustable spindles, are thus set in engagement with friction discs mounted upon other spindles, the latter spindles being worked either separately or together with a clutch and handle. The former spindles may be stationary, their discs constituting nuts that are joined to the counting mechanism. Further counters are joined to the other discs for making logarithmical calculations. Various modifications of the invention are specified.

13,839.—FILAMENTS FOR INCANDESCENT ELECTRICAL LAMPS: *B. M. Drake and Nernst Electrical Light, Limited.*—The filaments are fashioned with a flat, oval, rectangular, star, or pinion section, so that their surfaces shall be large in ratio to their sectional areas; they are composed of a paste of some refractory substance, and are hardened by being passed through an electrical arc.

13,896.—MANUFACTURE OF BLOCKS, &C., OF ARTIFICIAL STONE: *Soc. H. Croizier et Cie.*—The moulded blocks are hardened with steam pressure. A piston-rod or shaft, which can be lifted and lowered with a hydraulic cylinder, carries shelves or platforms upon which the blocks are laid. When the shelves have been loaded they are raised into a bell, on to the flange of which the lowest platform or shelf is bolted. After the articles have been hardened by steam admitted into the bell, the piston is lowered for a re-loading of the shelves.

13,898.—A BASE OR SUPPORT FOR POSTS, POLES, &C.: *L. K. Forsythe.*—A support for fencing-posts, telegraph, telephone, and electrical conductors, and so on, consists of horizontal blocks of concrete, stone, &c., which are tied with bolt-rods to an upright block fitted with flat or angle-iron binding-strips and staying-rods, the post being fastened with bolts to the strips—the strips may be replaced with a tanged metal socket at the top of the upright block.

13,919.—PROCESS OF MOULDING BRICKS AND TILES: *T. C. Fawcett, Ltd., and J. W. Bottomley.*—For making bricks and tiles having recesses. The plungers are provided with loose frames which springs press outwards, the slotted sides of the frames slide upon screws or stop-pins in the plunger; for a screw press is contrived a friction driving-mechanism which can be automatically thrown out of working, as the pressing-plunger rises to the top of its stroke, by means of a friction disc which is recessed at its middle, a clutch and a forked lever worked by hand in one direction at the beginning of the pressing action move a shaft lengthwise from one position to another, friction-discs are mounted upon the shaft, and the movement is continued by a balanced lever which impinges against a stopping-piece when the plunger has completed its stroke downwards.

13,931.—A VENTILATOR AND DOWN-DRAUGHT PREVENTER: *H. Brown.*—A set of inclined plates is disposed over the top of the fire so that their lower edges shall lie upon a crossbar and their upper ends upon rods that are held in slots in the outer casing of which the top consists of additional inclined plates; the lower plates divert products of combustion through side-spaces to outlets and thence to the flue, the down-draught being directed by all the plates through inner spaces to those outlets. For chimney-tops, the openings in the casing communicate with the outer air, and are turned away from the direction of the wind.

13,942.—SPIGOT-AND-SOCKET JOINTING AND PIPE-COUPLING: *W. Vanderman.*—A coupling-piece for waste, sewer, and other pipes is made of two portions which are screwed together internally and are then packed. The inventor claims that the device will facilitate repairing and plumbing operations.

13,947.—MANTLE HOLDERS FOR INCANDESCENT LAMPS: *G. Birch.*—The mantle holder is detachable, and supplies an incombustible socket for the mantle-rod whilst allowing air to flow to the lower edge of the mantle. It has a ferrule that fits over the head of the burner; a pierced flange which serves as a guard for the lower edge of the mantle; and a mantle-rod socket, with its lugs fastened either between lugs upon the ferrule and a lower ring, or between lugs on the ferrule and lugs upon a ring placed above.

MEETINGS.

FRIDAY, NOVEMBER 29.

Architectural Association.—Mr. Arnold Mitchell on "Capitals," with lantern views. 7.30 p.m.

SATURDAY, NOVEMBER 30.

Dundee Institute of Architecture.—Paper by Mr. W. M. Page, entitled "Notes on Art." 7 p.m.

MONDAY, DECEMBER 2.

Royal Institute of British Architects.—Business meeting.—1 To announce the results of the November examinations. 2. Election of candidates for membership. 3. Mr. Lacy W. Ridge to move:—"That the Royal Institute of British Architects desires to thank the Local Government Board for the issue of 'Model By-Laws, IV. (Rural Districts)' While doing so the Royal Institute would urge on the Board the desirability of preparing a model to enable Rural District Councils to regulate party-walls as distinct from external walls, a matter for which the Urban Model By-Laws, to which the Board refer them, are not available. The Institute ground this on the belief that the existence of properly constructed party-walls has proved an efficient barrier to the spread of fire, and that it is undesirable that such protection should be withdrawn in places where it has already existed." 4. Mr. Herbert W. Wills to move:—"That in the interests of the profession it would be advisable to have a list of 'Institute Assessors' drawn up, from which the President would nominate, and that this list be from year to year revised." 8 p.m.

London Institution.—Mr. A. W. Clayden, M.A., on "Photographic Study of Clouds," illustrated. 5 p.m

Society of Engineers.—Mr. H. Alfred Roechling, C.E., on "The Sewage Question during the last Century." 7.30 p.m.

Liverpool Architectural Society.—Mr. C. E. Bateman on "Castle Bromwich Church," illustrated with limelight views. 6 p.m.

TUESDAY, DECEMBER 3.

Institution of Civil Engineers.—Paper to be further discussed, "Train Resistance," by Mr. John A. F. Aspinall, M.Inst.C.E 8 p.m.

WEDNESDAY, DECEMBER 4.

Royal Archæological Institute.—Mr. Alfred C. Fryer, Ph.D., F.S.A., on "Fonts with Representations of the Seven Sacraments." 4 p.m.

British Archæological Association.—Mr. A. R. Goddard, B.A., on "The Underground Strong-Room at Richborough, Kent." 8 p.m.

Society of Arts.—Mr. H. Stone on "The Identification of Wood and its Application to Scientific and Commercial Purposes." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Edinburgh Architectural Association.—(Associates' Paper). Mr. J. Ednie on "The Applied Art of To-Day and Yesterday." 8 p.m.

FRIDAY, DECEMBER 6

Architectural Association Discussion Section.—Mr. S. Perks on "The Ethics of Dilapidations." 7.30 p.m.

Institution of Junior Engineers. (Westminster Palace Hotel).—Paper on "Street Railway Construction for Electric Traction," by Mr. F. S. Pilling. 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. R. W. A. Brewer on "Gas-Engine Construction." 8 p.m.

Birmingham Architectural Association.—Mr. H. H. Statham on "The Architectural Treatment of Bridges."

Glasgow Architectural Craftsmen's Society.—Mr. C. Ernest Monro on "Hotel Planning and Construction." 8 p.m.

SATURDAY, DECEMBER 7.

British Association of Waterworks Engineers.—Winter meeting of the Association, to be held at the Geological Society's Rooms, Burlington House, London.—1. Ballots for the Council and Officers for 1902-3, and for new members and Associates. 2. Discussion on Mr. Ingham's paper, entitled "The Design, Construction, and Cost of Open and Covered Service Reservoirs." 3. Paper, entitled "French Practice in the Manufacture of Cast-Iron Pipes," by Mr. A. G. Cloake. 4. Paper, entitled "English Practice in the Manufacture of Cast-Iron Pipes," by Mr. S. H. Terry, M.Inst.C.E. 5. An abstract, entitled "American Practice in the Manufacture of Cast-Iron Pipes" (from the *Engineer*), will be taken as read. 6. Discussion on the three papers above mentioned. 10.30 a.m.

British Institute of Certified Carpenters.—Annual general meeting, Carpenters' Hall. 6 p.m.

City of London College Science Society (White-street, Moorfields, E.C.).—Visit to the works of the Baker-street and Waterloo Railway, by permission of the contractors, Messrs. Perry & Co.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

November 12.—By FULLER, HORSEY, SONS, & CASSELL (on premises).

Battersea.—Wickersley-rd., site of the Pays Bas Chemical Works, area 62,700 ft., f.	£5 570

November 13.—By G. FITT & Co. (at Norwich).

Norwich.—St. Gile's-rd., the Plantation and 2 a. 3r. 0 p., u.t. 29 yrs., g.r., &c., 31*l.* 15*s.*	1,000
Brundall, Norfolk.—Riversdale House and 6a. 2r. 25 p., f.	1,200

November 14.—By WEATHERALL & GREEN (at Hastings).

Hastings, Sussex.—Sedlescombe-rd., &c., twenty-five freehold building plots	1,518

By A. BROMLEY SANDERS (at Exeter).

Stokenham, &c., Devon.—The Stokeley Estate, 1,257 a. 3 r. 25 p., f.	43,000

November 15.—By H. J. WAY & SON (at Brighton).

Brighton, Sussex.—Charlton Hill, The Foresters' Arms p.h., f., r. 26*l.*	850
Edward-st., The White Horse p.h., f., r. 45*l.*	1,125
Edward-st., The Plasterers' Arms p.h., f., r. 50*l.*	1,275
20, Edward-st., f., r. 16*l.*	425
8, 9, and 10, Rock-pl., f., r. 48*l.*	620

November 18.—By FAREBROTHER, ELLIS, & Co.

Hampstead.—12, Frognal, f.	4,500
City of London.—24, Cullum-st., f.	3,300

By FIELD & SONS.

Southwark.—105, Park-st., f., r. 40*l.*	630
Plaistow.—Milton-rd., f.g.r. 20*l.*, reversion in 79 yrs	480

By J. H. BETHELL (at Forest Gate).

Manor Park.—Clavering-rd., &c., 50 plots of freehold building land (in lots)	3,282

November 19.—By W. ASHMOLE.

Dagenham, Essex.—Crown-st., freehold house, shop, and baker's premises with goodwill	1,265
Crown-st., 4 freehold cottages	355
Crown-st. (rear of), two freehold cottages and block of building land	385

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By BEARD & SON.

Bayswater.—111, Cornwall-rd., u.t. 63 yrs., g.r. 10*l.*, r. 56*l.* £585
115, Cornwall-rd., u.t. 63 yrs., g.r. nil, r. 35*l.* .. 700
Paddington.—200, 202 and 204, Harrow-rd., u.t. 48½ yrs., g.r. 25*l.*, r. 185*l.* 1,430

By DAVID BURNETT & Co.

Mayfair.—77, Grosvenor-st., u.t. 15½ yrs., g.r. 44*l.*, r. 350*l.* 1,000
By E. H. HENRY.
Clapham.—Vernon-road, Claremont, u.t. 96½ yrs., g.r. 8*l.* 10s., e.r. 50*l.* 425
Stockwell.—94, Willington-rd., f., e.r. 45*l.* 550
21, Hubert-grove, u.t. 73½ yrs., g.r. 6*l.* 6s., r. 32*l.* 345

By WESTON & SONS.

Bushey, Herts.—Bourne Hall-rd., Tynecote and Bourne Hall Cottage, f., r. 64*l.* 1,080
Camberwell.—23 to 35 (odd), Westhall-rd., u.t. 62 yrs., g.r. 30*l.* 12s., r. 247*l.* 1,450
Croydon.—102 and 104, Southbridge-rd., f., r. 53*l.* 6s. 875
WOODS & SNELLING.
Orpington, Kent.—Copper Beeches and 2½ acres, f. 1,500
Edmonton.—1 to 5, Ann's Cottages, f. 540
MATTHEW MILES (at Masons' Hall Tavern).
Aldgate.—Church-row, the Bell p.h., u.t. 10 yrs., r. 100*l.*, with goodwill 750

November 20.—C. P. WHITELEY.

Whitechapel.—8, 9, and 10, St. Mark's-st., f., r. 150*l.* 3,360
St. Mark's-st., the Scarborough Arms p.h., f., r. 70*l.* 2,220
6 and 7, St. Mark's-st.; 1 to 27 (odd), Scarborough-st.; and 1, Tenter-st. West, f., r. 300*l.* 8,600
Clerkenwell.—61A, 61, 62, and 63, St. John's-square, area 3,780 ft., f., r. 13 *l.* 4,150
By HIBBARD & WHITTINGHAM.
Westbourne Park.—107, Cornwall-rd., u.t. 63 yrs., g.r. 10*l.*, r. 75*l.* 930

By HENRY HOLMES & Co.

Highgate.—34, Cromwell-av., u.t. 69 yrs., g.r. 9*l.*, r. 42*l.* 435
By T. H. MARTIN & Co.
Dalston.—23, Sandringham-rd., u.t. 64 yrs., g.r. 7*l.*, e.r. 60*l.* 540
By ALFRED RICHARDS (at Shanklin).
Shanklin, Isle of Wight.—Devonshire-villas, i.g.r. 30*l.*, u.t. 959 yrs., g.r. nil 695
The Esplanade, i.g.r.'s 30*l.*, u.t. 959 yrs., g.r. nil 660
By E. HOLSWORTH (at Peckham).
Peckham.—20, Tyrrell-rd., u.t. 75 yrs., g.r. 7*l.*, r. 30*l.* 250

By C. C. & T. MOORE.

Fleet-st.—47, Fetter-lane, f., r. 50*l.* 1,400
Wanstead.—1 to 13 (odd), Sydney-rd., f. 1,520
Commercial-rd. East.—No. 327, u.t. 36 yrs., g.r. 30*l.*, e.r. 100*l.* 455
West Ham.—103, Vicarage-lane, u.t. 78 yrs., g.r. 6*l.* 10s., r. 40*l.* 385
By NEWBON, EDWARDS, & SHEPHARD.
Highbury.—33, 35, and 37, Bryantwood-rd., u.t. 62 yrs., g.r. 13*l.*, r. 124*l.* 1,360
Bethnal Green.—37, 39, 41, 43, and 53, Hartley-st., u.t. 24½ yrs., g.r. 15*l.* 700
Camden Town.—8, Torriano-avenue, u.t. 42½ yrs., g.r. 5*l.*, r. 52*l.* 8s. 400
Stamford Hill.—80 and 82, St. Ann's-rd., u.t. 73 yrs., g.r. 13*l.*, r. 66*l.* 455
Stoke Newington.—26, Spenser-rd., f., r. 31*l.* 4s.. 405
By STIMSON & SONS.
Hackney.—55, 57, and 59, Warner-pl. and 56, St. Peter-st.; also the East London Saw Mills, u.t. 40 yrs., g.r. 100*l.*, r. 350*l.* 1,375
Peckham.—Denman-rd., a plot of building land, f. 330
Walworth.—35 and 37, South-st., f. 670
Croydon.—65, Lower Addiscombe-rd., f., e.r. 7*l.* .. 750
Brixton.—62, Knowle-rd., u.t. 60½ yrs., g.r. 6*l.*, r. 43*l.* 355
Bermondsey.—68, Galley Wall-rd., u.t. 33 yrs., g.r. 5*l.*, r. 52*l.* 425
Southend, Essex.—Cliff Town Parade, f.g.r. 24*l.* 10s., reversion in 56 yrs. 825
West Cliff Parade, i.g.r. 18*l.* 9s. 10d., u.t. 56½ yrs., g.r. nil. 380
By HOOKER & WEBB (at Croydon).
Croydon.—Bensham-lane, Littlecot, f., r. 34*l.* 600
Bensham-lane, Mann's Field (residence) and 3 a. 1 r. 9 p.; also f.g.r. 8*l.*, reversion in 59 yrs. 4,100

November 22.—By DRIVERS (Holloway).

Wood Green.—Tower-ter., moiety of f.g.r. 22*l.* 5s., reversion in 74 yrs. 505
Coburg-rd., f.g.r. 5*l.*, reversion in 62 yrs. 155
Hampstead-road.—79, William-st., u.t. 21 yrs., g.r. 7*l.*, r. 44*l.* 250
95, Drummond-st., u.t. 15 yrs., g.r. 7*l.*, r. 20*l.* .. 115
14, Rutland-st., u.t. 35½ yrs., g.r. 4*l.*, r. 54*l.* 645
Islington.—31, Theberton-st., u.t. 26 yrs., g.r. 7*l.*, r. 44*l.* 340
Hoxton.—142, East-rd., u.t. 17 yrs., g.r. 10*l.*, r. 26*l.* 8s. 160
By H. N. NEWTON & Co.
Bethnal Green.—208, Old Ford-rd., u.t. 45 yrs., g.r. 4*l.*, r. 26*l.* 285
By A. PREVOST & SON.
Bromley-by-Bow.—22 and 24, Chiltern-rd., u.t. 61 yrs., g.r. 7*l.* 570
Woodford.—Maybank-rd., f.g.r.'s 16*l.*, reversion in 80 yrs. 400
By ROBERT REID.
Marylebone.—6 Ridinghouse-st., with factory premises and yard, area 6,643 ft., u.t. 14½ yrs., g.r. 45*l.*, r. 300*l.* 2,150
Oxford-st.—63, Berwick-st., f., r. 100*l.* 2,900
By A. J. SHEFFIELD.
Somers Town.—73, Stibbington-st., u.t. 47 and 43 yrs., g.r. 5*l.*, r. 55*l.* 610
Bromley-by-Bow.—22 to 28 (even), Edgling-rd., u.t. 60½ yrs., g.r. 12*l.* 4s. 630
Manor Park.—52, Morris-av., f. 350
By E. & S. SMITH.
Pentonville.—55, Pentonville-rd., u.t. 8 yrs., g.r. 12*l.* 6s., r. 91*l.* 210

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 12 0	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 10 0	" "
Facing Stocks	2 12 0	" "
Shippers	2 8 0	" "
Flettons	1 8 0	" at railway depôt.
Red Wire Cuts	1 13 0	" "
Best Fareham Red	3 11 0	" "
Best Red pressed Ruabon Facing	5 5 0	" "
Best Blue Pressed Staffordshire	4 6 6	" "
Do., Bullnose	4 10 0	" "
Best Stourbridge Fire Bricks	4 4 0	" "
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers	13 0 0	" "
Headers	12 0 0	" "
Quoins, Bullnose, and Flats	17 0 0	" "
Double Stretchers	19 0 0	" "
Double Headers	16 0 0	" "
One Side and two Ends	19 0 0	" "
Two Sides and one End	20 0 0	" "
Splays, Chamfered, Squints	20 0 0	" "
Best Dipped Salt Glazed Stretchers and Headers	12 0	" "
Quoins, Bullnose, and Flats	14 0 0	" "
Double Stretchers	15 0 0	" "
Double Headers	14 0 0	" "
One Side and two Ends	15 0 0	" "
Two Sides and one End	15 0 0	" "
Splays, Chamfered, Squints	14 0 0	" "
Seconds Quality White and Dipped Salt Glazed	8 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7	3 per yard, delivered
Thames Ballast	6	0 " "
Best Portland Cement	32	0 per ton, delivered.
Best Ground Blue Lias Lime	25	6 " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s	6d. per yard, delivered
Stourbridge Fire-clay in sacks, 28s.	od.	per ton at rly. dpt

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. dep't.
Bath "	1 7	" "
Farleigh Down Bath	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Red Mansfield "	2 4	" "
Hard York in blocks	2 10	" "

		s. d.	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)		2 8	per ft. super at rly. depôt
" "	6 in. Rubbed Ditto	3 0	" "
" "	3 in. sawn both sides slabs (random sizes)	1 3	" "
" "	2 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks		2 3	per ft. cube. deld. rly. depôt
" " "	6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " "	3-in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep
" best seconds	10 15 0	" "
16 × 8 best "	6 2 6	" "
20 × 10 best blue Portmadoc	10 18 0	" "
16 × 8 best blue Portmadoc	6 0 0	" "
20 × 10 best Eureka unfading green	11 2 6	" "
16 × 8 " "	6 15 0	" "
20 × 10 Permanent green	10 0 0	" "
16 × 8 " "	5 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	48 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. ornamental Do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" " "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "

PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	"

	At per load of 50 ft.	
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
" " 3 in. by 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " " 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 10 0	13 10 0
" " " 3 in. by 9 in.	12 0 0	12 10 0
" " battens	9 10 0	10 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 9
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6

Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 0
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders " "	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Flitch Plates	8 10 0	9 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

IRON.—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
" " galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	22 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -

[*See also page 497.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
Schools	Kirkcaldy Burgh School Board ..	Not stated	Jan. 15
*Infirmary or Cottage Hospital, Leigh, Lancs.	The Committee	30*l.*, 20*l.*, 10*l.*	No date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Sewerage Works, Holts-lane	Clayton (Yorks) U.D.C.	S. Spencer, 344, Great Horton-road, Bradford	Dec. 3
Steel Bridge Girders	Great Western Railway Company	G. K. Mills, Paddington Station, W.	do.
Sewerage Works	Youghal U.D.C.	W. H. Hill, jun., 28, South-mall, Cork	do.
Paving Works	Heston & Isleworth U.D.C.	P. G. Packman, Surveyor, Town Hall, Hounslow	do.
Alterations, Wellington House, Bridlington	Dr. J. J. Coleman	J. Earnshaw, Architect, Bridlington Quay	do.
Additions to Schools	Royston (Yorks) School Board	J. Oldroyd, Architect, 16, Infirmary-street, Leeds	do.
Drainage Works	Cleethorpes, &c., U.D.C.	E. Rushton, Civil Engineer, Poplar-road, Cleethorpes	do.
School, Skerton	Lancaster School Board	Austin & Paley, Architects, Castle Park, Lancaster	do.
Laundry Works	Lexden (Essex) Guardians	G. H. Page, Architect, Trinity Chambers, Colchester	do.
*Stores Contracts	Great Northern Railway Company	Stores Superintendent, Doncaster	do.
Additions to Pump-room Baths	Leamington Corporation	Borough Engineer, Town Hall, Leamington	Dec. 4
Paving Works, St. Andrew's Dock, Hull	North-Eastern Railway Company	T. M. Newell, Engineer, Dock Offices, Hull	do.
Retaining Wall, South Back, Bonner's Field	Sunderland Corporation	Borough Engineer, Town Hall, Sunderland	do.
Sewers, &c., Cherryhinton	Chesterton R.D.C.	Waters & Worrall, Engineers, 2, Sydney-street, Cambridge	do.
Iron Fencing	Rathdown R.D.C.	R. M. Butler, Architect, 12, Dawson-street, Dublin	do.
Villa, Outlane, near Huddersfield	.....	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
House and Shop, Reston, near Berwick-on-Tweed	Hon. J. D. Logan	J. L. Miller, Architect, 39, Hide-hill, Berwick	do.
Electricity Plant	Manchester Corporation	G. F. Metzger, Engineer, Dickinson-street, Manchester	do.
Road Works, Vista-road	Clacton U.D.C.	A. R. Robinson, Surveyor, Town Hall Buildings, Clacton	do.
*Tar Macadam Works	Woolwich Council	Borough Engineer, Maxey-road, Plumstead	Dec. 5
Houses and Stables, Cope-street, Barnsley	.....	Senior & Clegg, Architects, Regent-street, Barnsley	do.
Business Premises, Leg-street, Oswestry	.....	W. H. Spaull, Architect, The Gables, Oswestry	do.
Alterations to Club, Burton-lane, York	.....	Secretary, Bootham-crescent, York	do.
Bridge Work, Pershore-road	Birmingham Corporation	J. Price, Civil Engineer, Council House, Birmingham	do.
Bridge Works, Gasworks-street	Huddersfield Corporation	Borough Engineer, Town Hall, Huddersfield	do.
Additions to Polytechnic, Selhurst-road, S. Norwood	Croydon Town Council	E. Mawdesley, Town Hall, Croydon	Dec. 6
Additions to Business Premises, Queen's-road	Halifax Industrial Society	M. Hall, Architect, 29, Northgate, Halifax	do.
Granite Setts	Northampton Corporation	W. I. Brown, Borough Surveyor, Guildhall, Northampton	Dec. 7
Additions to Schools, Annfield Plain	.....	G. G. Wilson, Architect, 121, Durham-road, Blackhill	do.
Works at Schools, Park-street	Blaenavon (Mon.) School Board	Lansdowne & Griggs, Architects, Newport, Mon.	do.
Additions, Power Station	Huddersfield Corporation	Borough Engineer, Town Hall, Huddersfield	do.
Sewerage Works, Thornton-le-Moor	Thirsk R.D.C.	Fairbank & Son, Civil Engineers, 13, Lendal, York	do.
Paving Works, Barn-street	Church (Lancs) U.D.C.	Surveyor, Council Offices, Church	do.
Partitions, &c., Forge Side Schools	Blaenavon (Mon.) School Board	Lansdowne & Griggs, Architects, Newport, Mon.	do.
*Mansions for Working Men, Hull	.....	Gelder & Kitchen, Architects, 76, Lowgate, Hull	Dec. 9
*New Bandstand at Highbury Fields	London County Council	Architect's Department, County Hall, Spring Gardens, S.W.	do.
Road Works, New Brompton, Kent	.....	W. I. Groombridge, 177, Balmoral-road, New Brompton	do.
Sewerage Works	Bridgend (Glam.) U.D.C.	M. Williams, Engineer, Station-road, Bridgend	do.
Two Timber Jetties	Llanelly Harbour Commission	H. W. Spowart, Harbour Offices, Llanelly	do.
Schools, Bodringallt (Wales)	Ystradyfodwg School Board	J. Rees, Architect, Pentre	do.
Ice Factory, Wulfruna-street	Wolverhampton Corporation	G. Green, Borough Engineer, Town Hall, Wolverhampton	do.
Road Works, Cambridge-road	Hale (Cheshire) U.D.C.	F. J. Lobley, Civil Engineer, Council Offices, Hale	do.
Villa, Myrtlefield, near Belfast	.....	W. J. Fennell, Architect, 2, Wellington-place, Belfast	do.
Infirmary	Bideford Guardians	R. T. Hookway & Son, Architects, Bideford	do.
Alterations to Eden Theatre, Bishop Auckland	.....	F. H. Livesay, Architect, Bishop Auckland	do.
*800 cube yards of 1¼-inch Quartzite	Beckenham U.D.C.	The Surveyor, Beckenham	do.
*Electric Light Station	Erith U.D.C.	W. Egerton, 12, Queen's-road, Erith	do.
*Additions to Polytechnic, Bedford Park	Middlesex County Council	H. T. Wakelam, Architect, Guildhall, Westminster, S.W.	do.
*Maisonette Houses, Wandsworth	.....	F. & W. Stocker, 90, Queen-street, Cheapside, E.C.	Dec. 10
*Superstructure of Three Blocks of Artisans' Dwellings	London County Council	Architect's Department, Housing Branch, 18, Pall Mall East, S.W.	do.
*Portable Floor to Public Baths	Barking Town U.D.C.	C. F. Dawson, Public Offices, Barking	do.
*Making-up Street	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	do.
*Boundary Wall at Norwood Schools	Lambeth Guardians	Guardian's Offices, Brook-street, Kennington-road, S.E.	Dec. 11
*Making-up and Paving Streets	Fulham Council	C. Botterill, Borough Surveyor, Town Hall, Fulham	do.
*Stores and Materials for 12 months	Nottingham Corporation	City Engineer, Nottingham	Dec. 12
Water Supply Works	Bakewell (Derbyshire) R.D.C.	Sterling & Swama, Engineers, Town Hall, Chapel-en-le-Frith	Dec. 13
Reservoir, Bar Brook, Totley	Chesterfield R.D.C.	R. E. Hartwright, Union Offices, Chesterfield	do.
Supplies for 12 months	Guy's Hospital	Superintendent	Dec. 14
School, Alnwick	.....	J. W. Douglas, 40, Bondgate, Alnwick	do.
Brick Outfall Sewer, Stoneware Pipe Sewer, &c.	Hornsey U.D.C.	E. J. Lovegrove, Engineer, Southwood Lane, Highgate, N.	Dec. 16
Schools	Tywardreath (Cornwall) Sch. Bd.	J. Cook, Tywardreath, Cornwall	Dec. 17
Sewage Disposal Works	Bury (Lancs) Corporation	A. W. Bradley, Engineer, Town Hall, Bury	do.
*Isolation Hospital, Great Stanmore	Hendon R.D.C.	J. A. Webb, Surveyor, Great Stanmore	Dec. 18
*Erection of Buildings for Electrical Power Station	Reading Corporation	Borough Engineer, Town Hall, Reading	Dec. 21
*New Bridge across River Ash at Littleton	Middlesex County Council	H. T. Wakelam, County Engineer, The Guildhall, Westminster	Dec. 31
*Extension of Seacroft Hospital	Leeds Corporation	The City Engineer, Leeds	Jan. 4
*Laying Second Line of Pipes, Thirlmere Aqueduct	Manchester Corp. Waterworks	G. H. Hill & Sons, 3, Victoria-street, Westminster, S.W.	Jan. 7
Stabling, &c., West Blandford-street	Newcastle-on-Tyne Co-op. Soc., Ltd	F. E. L. Harris, Architect, 1, Balloon-street, Manchester	No date
Additions to Hunters Inn, Heddonsmouth, N. Devon	.....	T. H. Watson & Son, Architects, 9, Nottingham-place, W.	do.
Restaurant and Shop, King Edward-street, Hull	Messrs. Powolny, Ltd.	A. Neill & Son, Architects, 38, Park-row, Leeds	do.
Reservoir, Harwood Vale, near Bolton	Bleaching Company	J. Sellers & Son, Architects, Union Chambers, Bury	do.
Sinking Well, Longsdale Lane, Woburn	Ampthill R.D.C.	D. Balfour & Son, Civil Engineers, 1, Victoria-street, S.W.	do.
Brewery, Keighley Green, Burnley	Brewery Company, Limited	C. Riley, Architect, St. James' Hall, Burnley	do.
Four Houses, Bolton Abbey, Yorks	.....	J. B. Bailey & Son, Architects, 3, Scott-street, Keighley	do.
Villa, Whitehead	Mr. A. E. Wilson	A. E. Wilson, 22, Waring-street, Belfast	do.
Three Houses, Cemetery-road, Porth, Wales	Mrs. T. A. Edmunds	E. Jones, Architect, Porth	do.
*Erection of House, Ulting, Essex	H. N. Falkner, Esq.	P. M. Beaumont, Architect, Maldon, Essex	do.
*Erection of Farm Buildings, Cavenham Hall, Suffolk	A. B. H. Goldschmidt, Esq.	do.	do.
*New School	Watford School Board	J. Hunt, Architect, 40, Upper Baker-street, N.W.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Manchester Watch Committee	3*l.* 3*s.* per week	Dec. 3
*Main Road Surveyor	Lancashire County Council	200*l.*, &c.	Dec. 7
*Outdoor Manager and Foreman	Ryde Council	2*l.* 2*s.* per week	do.
*Positions on Unestablished Staff of Architect's Dept.	London County Council	3*l.* 3*s.* and 2*l.* 2*s.* per week	Dec. 9
*Assistant Surveyor	Fulham Council	200*l.*	Dec. 10
*Surveyor	Litherland U.D.C.	200*l.*	do.
*Three Clerks of Works	Willesden District Council	4*l.* 4*s.* per week each	do.
*Two Sanitary Inspectors	Bermondsey Metropolitan Boro'	130*l.* each	Dec. 13
*Superintendent of Outdoor Work	Royal Borough of Kensington	250*l.*, &c.	Dec. 16
*Assistant Surveyor	Hanley Corporation	150*l.*	do.
*Senior Sanitary Inspector	Hampstead Council	250*l.* per annum	do.
*Engineering and Architectural Draughtsmen	H.M. Dockyard, Pembroke Dock	2*l.* 14*s.* per week each	No date
*Draughtsman	Civil Service Commission	Not stated	do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, *p.* iv. Contracts, *pp.* iv. vi. viii. x. & xxi. Public Appointments, *pp.* xix. & xxi.

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PRICES CURRENT (*Continued*)

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	. . .
,, ,, 22 g. and 24 g.	17 0 0	. . .
,, ,, 26 g.	18 10 0	. . .
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	. . .
,, ,, 22 g. and 24 g.	13 0 0	. . .
,, ,, 26 g.	14 0 0	. . .
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	. . .
,, ,, 22 g. and 24 g	13 5 0	. . .
,, ,, 26 g.	14 5 0	. . .
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	. . .
Pipe in coils	14 10 0	. . .
Soil Pipe	17 0 0	. . .
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	. . .
Silesian	24 0 0	. . .
COPPER—		
Strong Sheet per lb.	0 1 0½	. . .
Thin ,,	0 1 2	. . .
Copper nails ,,	0 1 2	. . .
BRASS—		
Strong Sheet ,,	0 0 11	. . .
Thin ,,	0 1 1	. . .
TIN—English Ingots ,,	0 1 3½	. . .
SOLDER—Plumbers' ,,	0 0 6½	. . .
Tinmen's ,,	0 0 5	. . .
Blowpipe ,,	0 0 9	. . .

ENGLISH SHEET GLASS IN CRATES.

	£ s. d.
15 oz. thirds 2½d. per ft. delivered.	
,, ,, fourths 2¾d. ,, ,,	
21 oz. thirds 3¼d. ,, ,,	
,, ,, fourths 3½d. ,, ,,	
26 oz. thirds 4¼d. ,, ,,	
,, ,, fourths 4½d. ,, ,,	
32 oz. thirds 5¼d. ,, ,,	
,, ,, fourths 5½d. ,, ,,	
Flinted sheet, 15 oz. 3¾d. ,, ,,	
,, ,, 21 ,, 4¼d. ,, ,,	
½ Hartley's Rolled Plate 2½d. ,, ,,	
⅜ ,, ,, ,, 3¼d. ,, ,,	
½ ,, ,, ,, 3¾d. ,, ,,	

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 11
,, ,, ,, in barrels ,,	0 3 0
,, ,, ,, in drums ,,	0 3 2
Boiled ,, ,, in pipes ,,	0 3 1
,, ,, ,, in barrels ,,	0 3 2
,, ,, ,, in drums ,,	0 3 4
Turpentine, in barrels ,,	0 2 3
,, in drums ,,	0 2 6
Genuine Ground English White Lead ...per ton	21 10 0
Red Lead, Dry ,,	22 0 0
Best Linseed Oil Putty ...per cwt.	0 9 0
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	per gallon. £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 18 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 6
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

W. H. J.—C. J. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

*** Denotes *accepted*. † Denotes *provisionally accepted*.**

ANNFIELD PLAIN (co. Durham).—For the execution of sewage disposal works, Dipton, for the Urban District Council. Mr. T. J. Trowsdale, surveyor, Annfield Plain :—

Joseph Dunn	£267 8 6	Samuel Dark, Annfield Plain*	£232 13 6

[Surveyor's estimate, £220 5s.]

AXMINSTER.—For the restoration of the north aisle roof of the parish church. Mr. E. H. Harbottle, architect, County Chambers, Exeter :—

Westcott, Austin, & White	£810 0	Tuscombe & Son, Ltd.	£565 0
W. Dart	799 0	Stephens & Son, Ltd., Exeter*	545 0
G. H. Lentil	654 6		
Nicks Bros.	599 0		

BARNSLEY.—For the erection of a church and schools, Wombwell. Mr. J. P. Earle, architect, Norfolk Chambers, Norfolk-road, Sheffield. Quantities by the architect :—

F. Fidler	£5,000	Taylor & Sons, Barnsley*	£4,698
C. Broadbent	4,899	J. Bishop	4,681
M. Grantham	4,708		

BROMLEY (Kent).—For erection of warehouse and forge, for Mr. C. Chitty. Messrs. Dale & Gadsdon, architects, 8, Union-court, London, E.C. :—

Lewis Evans	£798	Graty	£675
Crossley & Son	785	Arnaud & Son*	627

CARDIFF.—For additions to warehouses, Millicent-street, for Messrs. J. Isaac & Sons. Mr. E. G. C Down, architect, 31, High-street, Cardiff. Quantities by architect :—

Thomas & Co.	£570 0	Shepton & Son	£416 10
Geo. Griffiths	453 0	David Davies	405 0
Lattey & Co.	439 0	W. T. Morgan*	395 0
Knox & Wells	435 0	F. Small	390 0

[All of Cardiff.]

CHALFORD (Glos.).—For the erection of a school, Chalford Hill, for the School Board. Mr. V. A. Lawson, architect, 17, Rowcroft, Stroud :—

A. S. Cooke	£1,665 14 6	Drew Bros., Stroud*	£1,532 0 0
King & Son	1,645 0 0		
Orchard & Peer	1,590 0 0		

CLATTERBRIDGE (Cheshire). — For the erection of a fever hospital, for the Wurral Joint Hospital Board. Mr. C. O. Francis, architect, 5, Richmond-street, Liverpool. Quantities by the architect :—

E. Williams	£4,036 10 3	R. Allen	£4,550 0 0
Thomas & Sons	4,918 0 0	J. Barnes	4,356 0 0
Brown & Backhouse	4,755 0 0	Lee & Son, Higher Bebington*	4,010 0 0
J. E. Hardwick	4,700 0 0		
Forde & Co.	4,628 18 0		

DARTMOUTH.—For the erection of retaining wall, Victoria-road, and cutting road in Broad Park Field, for Lieut.-General Owen. Mr. E. H. Back, C.E., Dartmouth. Quantities supplied :—

Retaining Wall.

Robert Watts, Dartmouth*	£24 9	Edward Wills	£21 18

Cutting Road.

John Back	£120	Charles Mitchelmore, Dartmouth*	£98
Richard C. Pillar	115		

DOVER.—For the erection of an infirmary and nurses' home at workhouse, for the Guardians. Messrs. Cresswell & Newman, architects, Castle-street, Dover. Quantities by architects :—

G. Munro	£7,992 14 1	G. H. Denne	£7,674 0 0
Brisley Bros.	7,988 0 0	G. Keeler	7,655 0 0
Turner	7,965 0 0	Austen & Lewis	7,492 7 0
Tapner	7,890 0 0	W. G. Lewis	7,430 12 0
Warren	7,732 16 0	W. Bromley	7,410 0 0
Gann	7,695 0 0	Lewis & Sons	6,290 0 0

HANLEY.—For the erection of a junior mixed school, for the Hanley School Board. Messrs. Scrivener & Sons, architects :—

Bennett Bros.	£2,720	Tompkinson & Gettelley	£2,497
J. Stringer	2,683	Cornes	2,475
T. R. Yoxall	2,656	T. Godwin*	2,415
J. Bagnall	2,557		
G. Ellis	2,500		

LAINDON HILLS (Essex).—For the erection of a detached villa on the Nightingale Estate, for Mr. H. Foulger. Mr. H. G. Clark, architect, Wickford :—

C. T. Johnson, Whetstone, Middlesex* £455

LARNE (Ireland).—For the erection of chapels, boundary-walls, &c., Ballycraigy, for the Urban District Council. Mr. William Pinkston, Town Surveyor. Quantities by Surveyor :—

Girvan & Moore	£3,489 16	William McNeill, Larne*	£2,414 12
R. Calwell	3,400 0		
Heggarty & Gault	3,231 11		

LETTERKENNY.—For renovation of dwelling-house, including additions and sanitary arrangements, for Mr. Field. Mr. John M'Intyre, architect, Letterkenny :—

William Wilson	£312 0	Robert Kennedy*	£295 10

LLANDAFF (Wales).—For the execution of private street improvement works, for the Rural District Council. Mr. Jas. Holden, C.E., 35, St. Mary-street, Cardiff :—

Private Street Works at Ely.

Chas. Davies	£665 15 7	Thomas Rees, Crinallt, Ely, Glam.*	£528 2 6
J. Rich	635 1 1½		
F. Ashley	605 12 8		
J. E. Evans	596 10 1		

Private Street Works at Llandaff Yard.

Chas. Davies	£227 13 8	J. E. Evans	£189 16 6
James Rich	216 13 0½	E. W. Rees, Whitchurch, Cardiff*	179 16 5
Jno. Rees	216 11 3		
F. Ashley	204 0 7		

LONDON.—For the erection of mortuary buildings and chapel at the northern end of Manor-place, for the Borough Council of Paddington. Mr. George Weston, Surveyor :—

B. E. Nightingale	£4,188 0
Martin, French, & Co.	3,998 10
Richards & Co.	3,462 0
Spencer, Santo, & Co., Ltd.	3,399 0
Foster Bros., Suffolk-road, Norwood Junction, S.E.*	3,397 0

LONDON.—For the new boiler-house at the Albion Brewery, Shepherd's Bush, W., for Messrs. Griggs Bros. Messrs. R. W. Andrews & Co., architects and engineers, 148 and 150, Pentonville-road, N. :—

F. R. Tozer	£521	Lyford & Sons	£471
E. Jenner	496	Canning & Mullins*	465
Speechley & Smith	471		

LONDON.—For the erection of the North Branch Library, Lillie-road, for the Fulham Borough Council. Mr. C. Botterill, C.E., Town Hall, Fulham :—

Roome & Co.	£7,500 0	Martin, Wells, & Co.	£6,440 0
Barker & Co.	6,998 0	Simpson & Co.	6,380 0
Smith & Sons	6,997 0	H. L. Holloway	6,256 0
Spencer, Santo, & Co.	6,696 0	Foster Bros	6,196 0
R. E. Nightingale	6,615 0	Lole & Lightfoot	5,984 5
T. Bendon	6,587 0	F. G. Minter	5,891 0

LONDON. — For the erection of an iron mission church :—

W. Smith, Streatham* £204

NELSON (Lancs.).—For the erection of the Whitefield Schools, for the School Board, Nelson. Mr. T. Bell, architect, Grimshawe-street, Burnley. Quantities by architect :—

Masonry.—A. Robinson, jun., Brierfield*	£5,303 0 8	
Joinery.—Boothman & Sons, Nelson*	2,775 0 0	
Concrete.—The Asphaltic, Limestone and Concrete Co., Birmingham*	764 1 5	
Slating.—Stanworth & Son, Burnley*	547 18 3	
Plumbing.—J. Hargreaves, Nelson*	512 10 0	
Plastering.—Butler, Barrowford*	308 16 0	
Ironfoundry.—W. Walton, Burnley*	292 18 0	
Painting.—H. Nutter, Nelson*	128 1 5	

PONDER'S END (Middlesex).—For the construction of two new roads on the Durant's Arbour Estate, for the Enfield and District Freehold Land Co., Limited. Messrs. Michael Faraday & Rodgers, surveyors, 77, Chancery-lane, W.C., and Ponder's End :—

E. J. Betts, Enfield Highway £1,947 17 6

PONDER'S END (Middlesex).—For the erection of cottages for the Enfield and District Land Co., Limited. Messrs. Michael Faraday & Rogers, architects, 77, Chancery-lane, W.C., and Ponder's End, Middlesex :—

Constad & Co., Edmonton £7,680

RADCLIFFE-ON-TRENT.—For the execution of sewerage works, &c., for the Bingham Rural District Council. Mr. W. H. Radford, C.E., King-street, Nottingham :—

J. F. Price	£10,214 0 0	J. Ford	£7,952 0 0
Pattinson & Sons	9,052 0 0	John Holme	7,870 15 0
T. Smart	8,966 5 6	C. E. Carden	7,790 0 0
Geo Bell	8,789 0 0	G. F. Tomlinson	7,775 0 0
Lock & Andrews	8,691 11 10	H. H. Barry	7,770 0 0
S. E. Lucas	8,636 11 0	Cope & Raynor	7,667 13 0
Amos Jenkins	8,550 0 0	Johnson & Langley	7,291 18 11
Solomon Richmond	8,442 0 0	Bower Bros., West Bridgford, Nottingham*	6,948 0 0
Griseinthwaite & Newton	8,354 0 0		
Hawkins & Co.	8,094 9 8		

SOUTHEND-ON-SEA.—For the erection of twelve houses, Avenue Estate, for Mr. W. H. Pullin. Mr. F. A. Knight, surveyor, 2, Wetherby-terrace, Earl's Court, S.W. :—

Geo. Saint	£4,800 0 0	A. Ducat	£4,080 0 0
Holdstock & Mould	4,600 0 0	H. & S. Kerry	3,809 8 0
J. W. Jones	4,499 0 0	T. Lawford	3,750 0 0
F. J. Trew	4,350 11 2	Howard & Ruffell	3,679 0 0
Matthews & Son	4,270 0 0	A. Woodiwiss	3,396 0 0

WASHINGTON (co. Durham).—For additions to the Railway Tavern. Mr. G. Stephenson, architect, 20, Collingwood-street, Newcastle :—

G. G. Manners	£1,023	T. & J. White	£887
Woodall & Wilson	976	T. Robinson	796
S. Sheriff	895		

WICKFORD (Essex).—For the extension of drains and construction of outfall works, for the Billericay Rural District Council. Mr. H. G. Clark, C.E., surveyor :—

Frank Carter	£200 0	Wilson, Border, & Co.*	£194 10

WINDSOR.—For supplying and laying 600 super yards of blue bricks, South-place, for the Town Council. Mr. E. A. Stickland, Borough Surveyor, Alma-road, Windsor :—

H. Burfoot	£281 6 0	W. H. Wheeler	£200 12 0
Butcher & Hendry	264 10 0	T. Slaughter	193 0 0
A. H. Reavell	227 0 0	Geo. Chesswas, Isleworth*	175 6 2

[Surveyor's estimate, £180.]

[See also next page.

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LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's architect :—

* *Recommended for acceptance.*

ACKMAR-ROAD and BELLEVILLE-ROAD.—Repairs to furniture :—

	Ackmar-road.	Belleville-road.
H. Bouneau	£102 10 0	£50 10 0
T. Cruwys	88 19 3	33 15 11*
R. H. Galbraith	75 10 8†	34 14 0
General Builders, Ltd.	69 0 0†	49 0 0
Hammer & Co., Ltd.	70 0 0*	40 14 0
London School Furniture Co.	72 3 10†	34 11 0
Waring & Gillow, Ltd.	108 3 0	53 0 0

† These contractors have quoted for 88 desks instead of 113 under item 15 of the specification.

ANERLEY COTTAGE HOMES (for Deaf Children).—Providing and fixing hot-water supplies to baths, sinks, &c., in homes and superintendent's apartments, including all taps, valves, hot-water tanks, pipes, boilers, kitchen ranges, fixing, setting ranges, painting pipes, and attendance :—

Cannon & Sons	£320 0	Price Lea & Co.	£256 0
Wippell Bros & Row	320 0	Duffield & Sons	254 10
G. Davis	278 10	Wontner-Smith, Gray, & Co.	250 0
J. Esson	262 10	Paragon Heating Co.	236 18
Wenham & Waters, Ltd.	259 11	Vaughan & Brown, Ltd.*	227 0
J. & F. May	259 0		

BASNETT-ROAD. — Enlargement — Providing three additional 60 classrooms for boys, girls, and infants; reducing one class-room on each floor and providing corridor for access to new rooms. Net enlargement—Boys, 42; girls, 42; infants, 33. Total, 117. Also providing metal-work-room :—

F. & H. F. Higgs	£3,190	General Builders, Ltd.	£3,031
Holloway Bros.	3,167	J. & C. Bowyer	2,954
Wall & Co.	3,165	Bulled & Co.	2,926
Garrett & Son	3,116	E. Triggs*	2,750
Lathey Bros.	3,087		

GLOUCESTER-ROAD—(Boys and Girls).—Providing additional heating surface and providing and fixing auxiliary boiler :—

Clark, Bunnett, & Co., Ltd.	£695 0	Palowkar & Sons	£339 0
Brightside Foundry and Engineering Co., Ltd.	517 0	Defries & Sons, Ltd.	324 0
Cannon & Sons	425 0	Turner & Co.	209 10
Stevens & Sons	360 0	Oldroyd & Co., Ltd.	285 0
		Seward & Co.*	274 0

PLUM-LANE (Graded).—Providing and fixing complete low-pressure hot-water apparatus to two halls, twelve class-rooms, drawing class-room, cloak-rooms, corridors, and lavatories :—

Wippell Bros. & Row	£699 0	Brightside Foundry and Engineering Co., Ltd.	£567 0
Cannon & Sons	679 0	Werner, Pfleiderer & Perkins, Ltd.	483 10
Harlow & Son	657 0	Skinner, Board, & Co.	462 0
Paragon Heating Co.	575 0	Stevens & Sons*	460 0

ST. JOHN'S-ROAD.—Enlargement—Providing new classrooms :—Boys', 60; girls', 60; infants', 60; altering boys' steps to entrance; removing and refixing boys' entrance in boundary wall; altering, re-stepping, and re-lighting one north classroom (boys, girls, and infants) and forming corridor as access to new room, and reducing room to 48 in boys', girls', and infants' departments; and extending boys' covered playground on roof of building. Revised accommodation :—Boys', 528; girls', 528; infants', 633 : total, 1,689. Net enlargement :—Boys', 48; girls', 48; infants', 33; total, 129 ;—

Wall & Co.	£3,414	Willmott & Sons	£2,839
Snewin, Bros., & Co.	3,241	C. Cox	2,811
Treasure & Son	3,182	L. H. & R. Roberts	2,797
F. & F. J. Wood	2,966	W. Shurmur	2,790
Dearing & Son	2,932	McCormick & Sons	2,780
Grover & Son	2,920	Clarke & Bracey	2,752
King & Son	2,879	Williams & Son*	2,653
Simpson & Son	2,840		

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The Builder.

VOL. LXXXI.—No. 3071. DECEMBER 7, 1901.

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Ancient Theatres in Crete.

THE Italian archæological expedition to Crete has recently made some important discoveries at Phaistos, near Gortys (or Gortyna), where what is supposed to be one of the oldest Greek theatres has been discovered. Apropos of this fact it may be of interest to publish some curious old documents of the sixteenth century describing the condition of many of the greater Roman monuments in Crete as they existed at that period, when the Venetians held sway in the island, and possibly carried on an extensive destruction of such things for the sake of transporting the old materials to Venice and elsewhere.

These documents, from which the following extracts have been made, consist of some old letters and a bundle of original plans, preserved amongst the MSS. of the Ambrosiana at Milan. It is possible they are not the true originals; the custom of collecting MSS. seems long to have survived the use of printing, especially in matters of merely local or special interest, but in any case they are of contemporary character. A large collection of Greek inscriptions is bound up with these documents, and they may possibly have been already printed, but the architectural portion has certainly never before been published. The original drawings were made to fit pieces of paper of an uniform size; in our translation they have been all reduced to one uniform scale of the "foot" of Vicenza, *i.e.*, the old Venetian foot which was in the sixteenth century somewhat larger than the modern English measure (3 Venetian feet = 1 metre). The plans, although measured with care, are evidently somewhat sketchy and the work of an amateur. In translating the extracts from the letters the Italian place-names have been retained in their spelling of the period. There are several evidences of what seem to be mistakes on the part of a copyist.

The collection is entitled "Drawings of Theatres and Temples sent from the island of Candia by Honorius Belli to his uncle, Valerius Barbarano of Vicenza." The author would appear to have been a medical doctor, perhaps in charge of a hospital at Gortina, to which he refers in the first letter. He is also known as a corresponding member of the College of Medicine of Vicenza. His leisure time seems to have been given to the study of antiquities with all the enthusiasm of that Renaissance age, and he seems to have been a good deal engaged in stealing the Roman works of art from Crete, in the customary way in which Venetians stole from all parts of the Levant in those days.

Letter I.

"*Magnico Sigre Zio Ossmo.*—I send you three plans of theatres from the many which I have made drawings of during my pilgrimage through all this kingdom. That of Gierapetra was richly adorned with two orders of columns of the whitest marble, five quarters (?) in thickness, and of the Ionic order, with very beautiful capitals and cornices.

Many of the statues from this theatre I sent to Venice, but others of stucco, which were entire when I was dismantling the front, were reduced to powder in course of removal. The columns are nearly all spoilt by the action of fire. Many of the spectators' seats, two Vicenza feet in width, are still entire. The columns of the portico behind the proscenium at Gierapetra are of the same sort as the two columns at Venice. There are such quantities of columns at Gierapetra and Gortina as to stupefy the beholder.

The small theatre at Gortina was of the Doric order, the columns being of white and black marble (*sic*) incrusted with different coloured marbles (!). The great theatre had a most ornamental proscenium with most beautiful marble columns 16 ft. high and one foot and a half, and one inch (oncia) thick, of the Ionic order and the whitest marble. There are no traces of any portico behind the proscenium, and what is particularly remarkable is that immediately behind the proscenium passes the river Letteo which is covered over for a distance of about two hundred paces, and over it are built the hospitals and many other houses. This tunnel is built of very large stones without mortar, and the work is still in an intact condition. I have walked along its whole length, having been told there were many inscriptions cut upon it, but I saw nothing of the kind. The bed of the river is much filled with ruins, and it is much altered from its original course. You must understand that in making these plans I have used the greatest diligence as I had plenty of time and opportunity for the purpose. Now I will not write more but recommend myself, &c. From Canea the 24th day of April (old style), 1586.—*Vostro nepote, Honorio de Belli.*"

Two notes are written in a different hand between the letters:—

"In the smaller theatre of Gortina, the measurements are a little less than the original; in the Great theatre they are a little larger than they should be. The lines which show the stepped seats must be made parallel.

In the smaller theatre of Gierapetra, the stepped seats in the original are prolonged beyond the half circle by an extra pilaster. Any one wishing to correct this must place the pilasters in such a way—providing not more than sixteen for the purpose—at an equal distance from each other, and lengthening the plan accordingly."

Letter II.

"*Magnico Sigre Zio Ossmo.*—I send you the plans of three more theatres and of a temple of the city of Litto. There is some obscurity as to the prosceniums of the theatres on account of their much-ruined state, which prevents one's seeing how they were originally arranged. The stepped platforms (for the spectators) were cut in the slope of the hill, which consists of a soft tufa easily quarried. This tufa is also used for covering houses and for making terraces to resist the rain.

This Great Theatre of Litto is the largest ever constructed in the kingdom of Candia. It had three ranges of copper vases contrived for the purpose of increasing the sounds, and nearly all the cells where these were placed may still be seen. The city of Litto was built on a hill with several summits, and had a very small amount of level space, but everywhere one ascended or descended. Altogether the site is the most unusual and worst ever seen, notwithstanding it had buildings of great importance, and I found there many beautiful statues which you can now have the opportunity of seeing in the house of my illustrious *Patrone*. I also found there a great many epitaphs which you have already seen, from which it is clear (as Polibius describes) that the inhabitants of Gnosso and Gortina ruined this city. At the same time it would appear that in the times of Trajan, Hadrian, and the Matidie (*sic*) this city was in a flourishing condition, and distant from the

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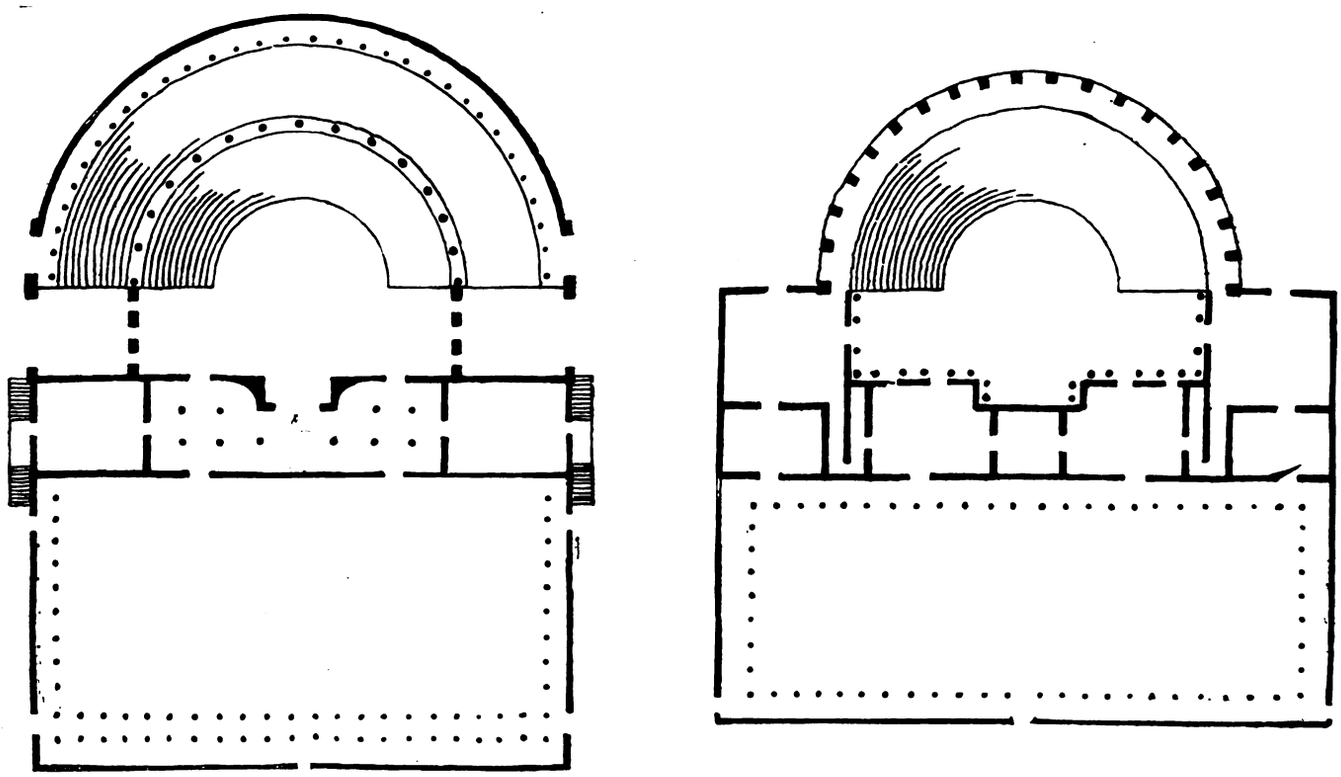
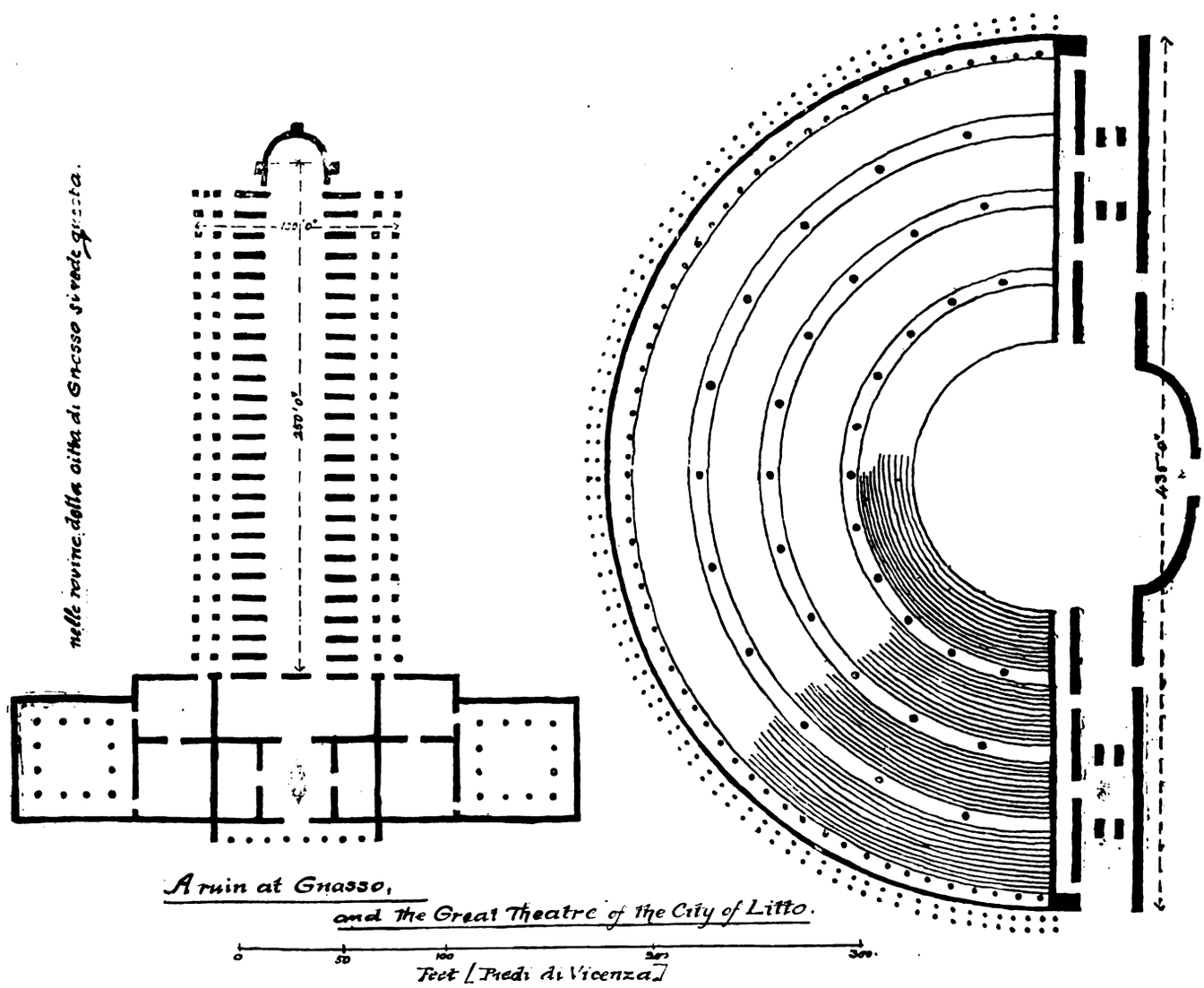


Two Theatres of the City of Gierapetra.

50 100 200 300

Feet [Piedi di Vicenza]



A ruin at Gnasso,
and the Great Theatre of the City of Litto.

0 50 100 200 300

Feet [Piedi di Vicenza]

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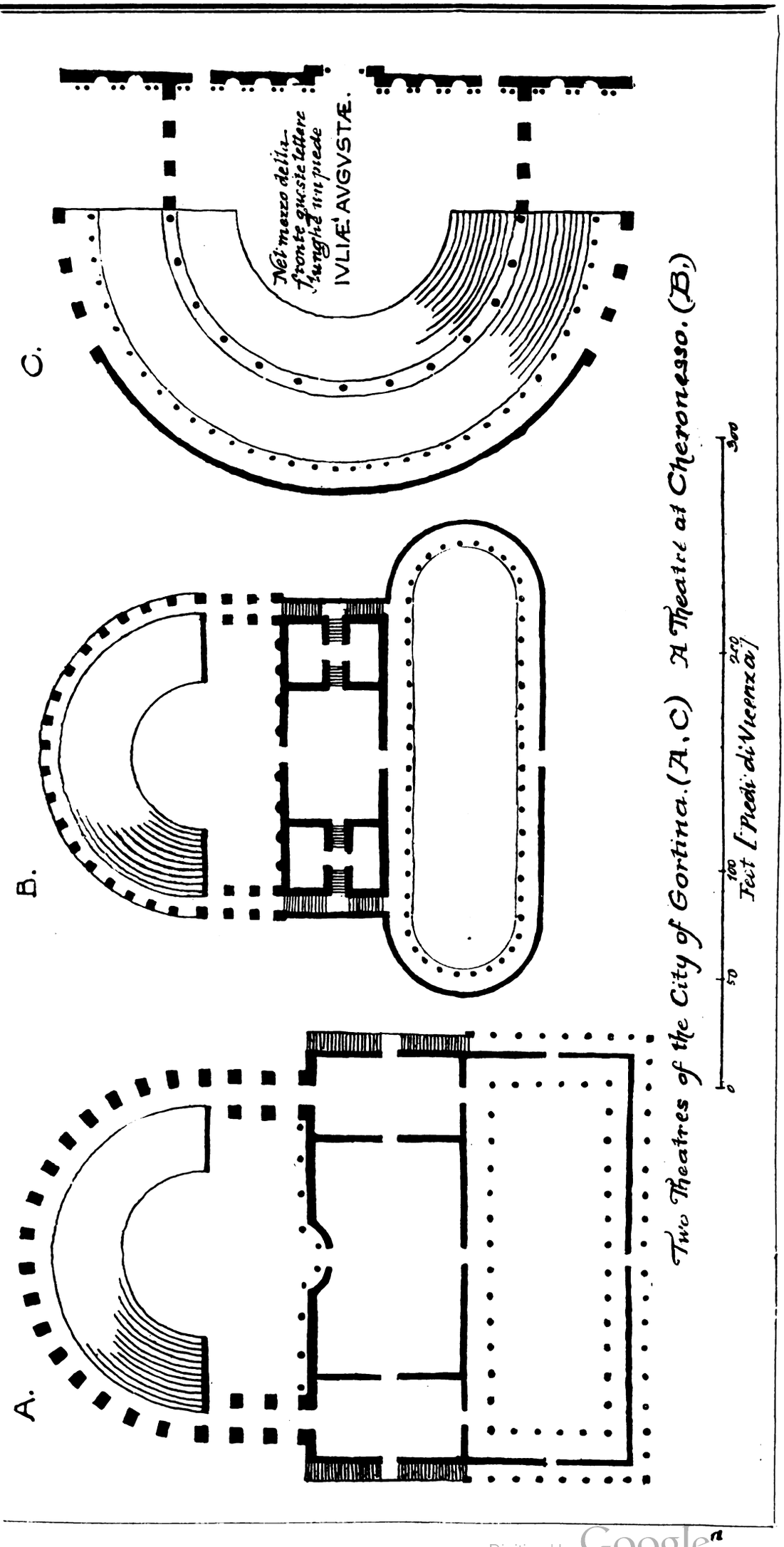
northern sea about twelve or fourteen miles, on the borders of which sea was another city called Cheronesso, now Chirossonisso. This latter was the harbour for the ships belonging to Litto, and between one and the other was a fine, well-made road, crossing hills and valleys without difficulty. There is also a stupendous aqueduct which conducts water from a copious spring four or five miles above Litto, at a place in the mountains of Sasati, which are very high. This aqueduct leads the water, first to Litto, then to Chirossonisso, across the hills and valleys with so many turns and over such high arches as to stupefy the beholder, for its length is really about thirty miles. This aqueduct is still standing almost intact, for it is built with such solidity that in my opinion vestiges of it will remain to eternity.

The city of Cherisonisso was but small—I think not more than two miles in circuit—whilst Litto was four. But, although it was a small city, it possessed an amphitheatre of no great size, which I now send you, and many great and fine buildings. It had also a port (now silted up) capable of containing thirty galleys, and, according to Strabo, here was the temple of Brittomart, of which there are still some vestiges visible.

Another theatre is the great one at Gierapetra, which also was cut out of the rocky side of the mountain. It also had an arrangement of copper vases, as may be seen by the cells which remain in an intact condition. The natives of those parts, who know nothing about theatres or cells, call them ovens, and the fables they have concocted about these ruins are enough to make Melancholy laugh. The proscenium of this theatre was adorned with columns, cornices, &c., of white marble mixed with a kind of red stone resembling the Veronese, but everything is ruined and broken. The order was Ionic, like nearly all the buildings of this kingdom. For a long time the Corinthian order did not reach that perfection which has been discovered and made use of by Palladio.

The plan of a temple which I send you is of that in the city of Lebeno, the port for Gortina; a distance of twenty miles separates the two cities. Lebeno is about twelve miles from Limenos and Lassea, cities visited by St. Paul when on his way to Rome, according to St. Luke's account in the Acts of the Apostles.

Lassea still retains its name, although it is quite ruined, and the nearest inhabitants are four or five miles off in a monastery of Caloyers called Pesonesso, a most beautiful place. These Caloyers have more than 2,000 ducats of income, and



Two Theatres of the City of Gortina. (A, C) A Theatre at Cheronesso. (B.)

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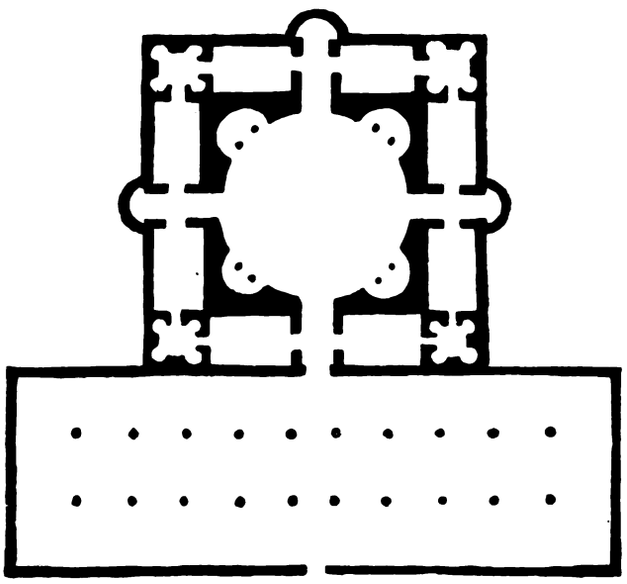
are most kind and courteous, and have the finest wine in the world.

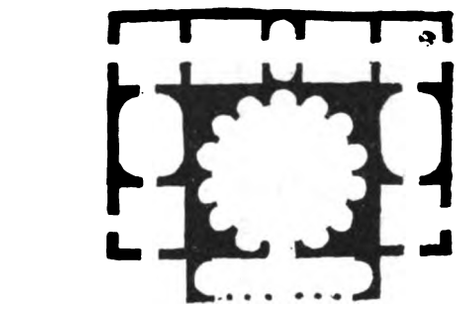
The city of Lebeno is now called Leada, and is entirely ruined; only a few mud houses remain. The port is quite ruined and become open sea-beach, where there is a place that they use for making signals in smoke or fire whenever the corsairs are discovered off the coast. Now, returning to the temple, it was built on a hill and had many columns of that sort of stone of which the two columns in the Piazza of Venice are made. Many of these columns are in existence, but all are ruined by fire. I think this temple must have been dedicated to Esculapius, because in a panel there I have seen a very great serpent sculptured, and because Pausanias mentions in his description of the territory of Corinth, a temple in Labene, a city of Candia, which was made as a copy of that which existed in Cirene.

The drawings which I now send you have been made in a hurry, and the ink and paper have tried me beyond measure (*mi hanno assassinato*), but those in my book are much better. Recommending myself to your good graces, I beg you to salute *Madonna* in my name and in that of *Madonna Bianca*. From Canea—October 11 (old style), 1585.—*Di V.S. nepote come figliuolo,*

Honorio de Belli."



In the City of Lebeno.



In the City of Lampo

0 50 100 200

Feet [Piedi di Vicenza]

In studying this series of sketches of old Romano-Greek theatres some subjects of interest seem to suggest themselves. In the first place, there seems a connexion between its being sent home in 1586 and the creation of that fantastic model of an "Olympic" theatre built by Palladio in Vicenza in the closing years of the sixteenth century, and completed after his death in 1584. This curious old model of a Greek theatre is a striking instance of that ardent longing which seems to have filled Palladio and his contemporaries to produce the absolutely exact copies of the buildings wherein their beloved models of classic times moved and had their being. At the present day such an attempt to reproduce a Greek or Roman theatre would hardly be made without some imitation of the proportions of an original example. The model at Vicenza looks ridiculous on account of its small size. The absurd perspective backgrounds appearing through the openings of the proscenium may belong to a later period than Palladio. The school of architecture which Palladio so materially assisted in originating must be credited with much greater success in designing churches in imitation of pagan temples than in reproducing a classic theatre. At the same time this little theatre of Vicenza is perhaps the prototype of the theatre of modern days, and as an evidence of its practicability, it is still occasionally used in the daytime—a wise regulation of the authorities prohibiting any lighting up of the building, for fear its worm-eaten old timbers should share the fate of many a theatre since the days of Palladio. It is probably the oldest surviving attempt to restore the *mise-en-scène* of the classic drama, and if these drawings of Cretan antiquities were made in reference to its completion—as would seem very probable—they derive some interest from that fact. The building of the theatre in Vicenza was at the expense of an "Accademia," or literary-artistic society of the city, and no doubt the local interest in the matter would be very keen, and Uncle Valerio Barbarano was probably one of the interested parties.

The plans of the theatres in Crete are shown without the usual divisions of spectators' seats into *cunei*, but this is perhaps merely a careless omission. A much more important peculiarity about the drawings is the very unique way in which the *praecinctiones* are shown as occupied by concentric rows of columns. Such an arrangement of course suggests the "covered theatre" of antiquity, of the construction of which we seem to know very little. The *Odeion*, or covered theatre of the Romans, used for musical performances, seems to have been a common adjunct to a Roman provincial town during the Empire. The best-preserved example is perhaps the theatre of Herodes Atticus, built at Athens in A.D. 161. It is said that charred remains of timber and brickwork, supposed to have been used in the construction of the permanent covering, were found here in 1848, when the ruins of the Acropolis were undergoing exploration. At the present day there are certainly no traces of such a roof, nor do there appear to be any remains of columns on the *praecinctio* in the position shown on the Cretan plans. The whole question of how an Odeion was roofed over remains a puzzle, unless these examples of such buildings in Crete, which were, of course, in a more perfect condition 400 years ago, may throw some light upon the subject. It may be suggested, however, that if the roof was carried on the columns as shown in De Belli's sketches, the lowest row near the proscenium must have been phenomenally high, and perhaps slender, or the back seats of the auditorium would have had but a poor view of the stage, especially in the case of the great theatre of Litto. The covered theatre of the Romans was evidently a great stride in such arrangements from the simple Greek theatre excavated in the hill-side, exposed to a great extent to the sun and rain, and almost unusable at certain seasons.

In his first letter De Belli speaks of the columns at Gierapetra (Hierapetra) as being all spoilt with the action of fire. This intimation of the aspect of the ruins in 1586 would accord with the idea of the concentric rows of columns having at one time supported a roof. Palladio, when designing the Vicenza theatre, would probably have derived his information at second hand. He seems never to have travelled beyond Rome (where he had hopes of succeeding Buonarotti at St. Peter's), and consequently he did not see the great theatres of Sicily, which would doubtless have inspired him with a grand idea for such a building. He very probably had access to such information as could be gleaned from the collections of Antonio and Francesco San Gallo (now in the Barberini Coll. Rome) which contain sketches made in Athens and elsewhere in Greece. But during the sixteenth century very little was known about Greek antiquities, and not until after the brilliant expedition of Morosini in 1685 was any effort made to publish works illustrating the monuments of ancient Greece, such as the folios of Fanelli and Coronelli about the close of the seventeenth century.

The mediæval idea of a "stage" seems never to have developed into more than a mere staging. The modern conception of a theatre, with its proscenium and accessories, may perhaps be attributed to the sixteenth century efforts to resuscitate the classic drama after a lapse of more than a thousand years.

UNDERGROUND TRAMWAYS.

THE ever-increasing congestion of street traffic in the central parts of London is already recognised as a problem for which it is most urgent that some satisfactory solution should be found. During recent years the steady increase of traffic has been most noticeable, the results being an intolerable nuisance and loss to those having business premises along many thoroughfares, and much inconvenience and loss of time to the travelling public. This normal condition is much aggravated by the frequent tearing up of street surfaces and the dilatory manner in which work is done before they are restored. It would be im-

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possible for the most imaginative comic paper to exaggerate the utterly absurd methods of the privileged disturbers of London thoroughfares, whose operations add so largely to the difficulties of street locomotion. Even leaving their depredations quite out of the question, it appears to be the fact that the money value of the time now lost owing to congestion of traffic amounts to many millions of pounds annually. According to a recently published estimate by Sir John Wolfe Barry, the loss at four only of the busy centres in London, namely, Cheapside, the Strand, Piccadilly, and the Oxford-street corner of Tottenham Court-road, may be reckoned at no less than 2,154,000*l.* per annum. It will, therefore, readily be seen that if other well-known centres were considered in a similar manner, the total loss must mount up to an appalling sum. Figures such as these may not be before all those who join in condemning the traffic facilities of the metropolis, but that they are more or less familiar to many of the public authorities supposed to be responsible for the proper government of metropolitan boroughs cannot be doubted.

The fact is, however, that none of the authorities in question have power to do anything to ameliorate the hard lot of the population. No single body could do any material good without the consent of others, whilst the formulation of a complete and really satisfactory scheme can only proceed from a central board armed with ample Parliamentary powers to carry into effect whatever might be devised for the good of the community. In other cities and towns such bodies actually exist and do their work in a practical and businesslike way. For examples we may take the Corporations of Glasgow and Liverpool, with the admirable tramway systems of those cities, and the Rapid-Transit Commissions of Boston and New York, with which are associated still more desirable methods of dealing with street traffic. For means of locomotion, London is at present almost entirely dependent upon the money-making instincts of commercial companies and private individuals, each playing his own game and only concerned in benefiting the public so far as that contingency may appear to be likely to pay. The streets have hitherto been practically at the disposal of any one desiring to use them, and any one has been perfectly free to introduce whatever inconvenient or unsuitable class of horse-drawn conveyance might be chosen for trade in locomotion. The only means of transit upon which restrictions have been placed are those of improved character, such as tramways and mechanically-driven carriages. Some improvement is now evident with regard to the two last-mentioned systems of locomotion, but much remains to be done before the position can be regarded as satisfactory.

One of the most hopeful signs is the remarkable and praiseworthy interest taken by the London County Council in the question now under discussion. People are not wanting who unhesitatingly condemn the ownership of tramway systems by municipal bodies generally, and by the London County Council in particular; but the true point for consideration is whether we can hope for reforms of really comprehensive character from any other quarter. It is possible that after some years of deliberation a Royal Commission might recommend to the Imperial Parliament the creation of a Rapid-Transit Commission, but it is equally probable that such a commission would never be appointed, or only appointed after the lapse of several years. Further, the County Council is already empowered to deal with various details that are directly and indirectly connected with such work as would fall within the scope of any transit commission. For these reasons we think the Council may properly be entrusted with the reorganisation of street traffic, and with the provision of additional means of communication, although not to the exclusion of companies who may be working upon other lines. Thus the salvation of the metropolis need not depend solely upon the London County Council, nor upon the various companies interested in the construction of deep-level railways. As the aim of the Council is to deal exclusively with lines upon or near the surface, no obstacles need exist against the unlimited extension of tubular railways. There might, and naturally would, be competition, but that there will be plenty of passengers for lines at both levels no one can for a moment doubt.

Since acquiring the tramway systems now under their control, the London County Council has been troubled by the fact that the City Corporation and the West End authorities seem determined to resist any attempt to introduce tramways within their territories. As Parliament similarly refuses to permit the passage of tramways over Westminster Bridge, and as many streets would require expensive alterations even if way-leave were obtainable, the difficulties in the way of making adequate connexion between the northern and southern tramway systems appear to be almost insuperable, except by the aid of shallow subways into which the surface cars could dive on approaching prohibited areas. This solution was first suggested at a meeting of the Council on June 13, 1901, when it was decided that the Highways Committee should investigate and report upon the practicability of constructing a shallow underground electric tramway from Westminster, *viâ* Parliament-street, Strand, Fleet-street, and Cheapside, to the Bank, thence under Moorgate-street to Finsbury-pavement, on a principle similar to that adopted in Budapest, and Boston, U.S.A., provision being made beside the tram-lines for subways to contain gas and water mains, electric light mains, telephone wires, and other conduits. Since that time the Central London Railway has been opened and has proved how great are the possibilities of an efficient and rapid underground railway in London. The Paris, Budapest, and Boston systems have been similarly successful, and the great undertaking in New York, to which a further reference is made in this issue, has been well advanced toward completion. In the meantime the Council has not been idle; the subject has several times been before the Highways Committee, and the Tramways Manager and the Electrical Engineer to the Council have recently returned from the United States, where it was their duty to inquire into the latest developments of electrical traction generally, and particularly to study the construction and working of the subways in Boston and New York. In their Report, now made public, we find attention is devoted entirely to the description of the subways mentioned, leaving electrical matters to be dealt with in a separate Report. So far as Boston is concerned, it may be useful to remark that the conditions of traffic before the subway came into operation were extremely unsatisfactory. In Tremont-street especially the stream of cars seems to have constituted a nuisance as unmitigated as that due to the endless line of omnibuses to be found in London. To quote from an old Report of the Commissioners of Boston, the surface cars "moved in an almost unbroken procession with a slowness which was vexatious, aggravated by stops of uncertain duration. The rate of progression was often not more than two miles per hour." Then the American mind promptly grasped the situation, and a Rapid-Transit Commission was formed to deal with the whole question of city communications, of which the new subway formed merely a part. The total length of subway authorised was about five miles of single track, part being for four lines, and part for two lines. At Boylston-street an incline admits cars to the subway, which, passing beneath the edge of Boston Common to Tremont-street, is joined by a branch coming from Pleasant-street, where another incline leads to the surface. From the junction the subway continues to the Tremont-street side of the Common to Park-street, the centre of the system, where there is a loop terminus. From Park-street the subway is carried under Tremont-street to Scollay-square, and by branches under Hanover-street and Cornhill to a junction under Washington-street, continuing thence to Haymarket-square, and immediately afterwards rising to the surface. With the exception of short lengths, the whole of the excavation was performed by the cut-and-cover method, continued day and night and also on Sundays, the car tracks being undisturbed and the surface of the streets left free for traffic during the daytime.

Such, briefly, is the history and character of this undertaking, which has proved so inestimable a boon to the city of Boston, and of which the Park-street station is said to possess a traffic equal to the largest amongst other stations in the world. An interesting account is also given in the Report of the New York subway works, intended to provide facilities for traffic in a city where natural difficulties are far greater than those presented in London, and where the streets are in a particularly congested condition. A very unsatisfactory detail noticed in each case is the absence of proper accommodation for the pipes and other conduits, a point to which attention has previously been directed in our columns. On the other hand, great care has been taken to secure efficient ventilation, a matter that does not appear to be understood by the eminent engineers to whom London is indebted for the low-level lines constructed of late years. Generally it may be said that their visit to the United States has convinced the reporters of the entire practicability of shallow tramways for the needs of London, an opinion in which we quite concur. Many passengers are timid, and object to bury themselves 70 ft., or 80 ft. below the surface, or to be carried up and down by lifts. Others think of the time spent on the lift journey and in waiting a minute or two for a

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train. People of these classes would certainly prefer simply to descend a few steps, and to board one of a stream of single cars, instead of travelling under present conditions; and this alternative method possesses other incidental advantages. For instance, single cars carry away passengers as soon as they arrive on the platform, and deliver them to the street again at a steady rate, instead of discharging crowds amidst noxious fumes every few minutes, as in the case of our tubular railways. Again, the shallow tramway system would enable the Council to deal suitably with the great and pressing question of underground conduits the treatment of which would be facilitated very greatly.

That many difficulties and much opposition will have to be encountered we do not for an instant doubt. That is the fate of every single thing likely to be productive of good, notably in conservative-minded London. The treatment of vested rights in premises with basements projecting beneath the footway may be attended with difficulty, and objections on the score of vibration will probably arise. These and other points are quite capable of proper adjustment, and it is to be hoped that the evident desire of the Council may shortly find expression in the formulation of a definite scheme for the inauguration of the new means of communication foreshadowed in the Report.

NOTES.

The New Government Offices.

WE publish in another column the correspondence which has passed between the Council of the Institute of Architects and the Office of Works in regard to the carrying out of the late Mr. Brydon's building. It appears that the excuse now put forward by the Office of Works for not appointing an eminent architect to carry out Mr. Brydon's design is that they have been unable to find any eminent architect who would be willing to carry out the work without putting his own individuality into it; and the Office of Works are so tender of Mr. Brydon's reputation that they cannot bear to expose his design to the risk of being thus tampered with. The argument, which in any case could only be received with laughter, is knocked from under them by Mr. Leonard Stokes's letter in Thursday's *Times*, in which he points out that Mr. Brydon's drawings are so incomplete that in any case there must be some fresh individuality imported into the building, and his friends had hoped that it would have been the individuality of some eminent architect and not that of the Office of Works. It pleases the Office of Works now to assert that their official architect is an eminent architect, but unfortunately we have his Post Office buildings in evidence on this head, and it is perfectly certain that his appointment would never have satisfied poor Mr. Brydon. But the feelings of an eminent architect — more especially when he is dead and out of the way—are of no consequence in the estimation of the Office of Works.

The Housing Question.

THE conference held this week at the Westminster Palace Hotel on housing in town and country will, we hope, have some practical results, chiefly by being the beginning of further legislation. It is admitted by men of all political parties that the houses of the dwellers in rural districts are in many places insufficient in numbers, and it is certain that the only way to remedy this defect is by giving greater power to the Local Government Board to order the building of dwellings if the supply is found on inquiry to be insufficient. This was in substance one of the resolutions which were carried at the conference, and it forms the basis for a further piece of short, and it may be hoped effective, legislation. At the present time the Local Authorities in the rural districts do not recognise the pressing need for more and better dwellings, and it has been the national policy for many years that when Local Authorities do not recognise the duties imposed on them by the Legislature in sanitary matters, the central government should have powers of compulsion direct and indirect. This is obviously the only policy which promises any effective results in regard to the housing question in rural districts.

Stockport Workhouse Infirmary Competition.

ON Monday last the Stockport Guardians indulged in a discussion which is not pleasant reading. In March last sixteen designs submitted in the competition for the infirmary were exhibited, and a brief review of these designs was given in our columns. The first premium was awarded to Messrs. Giles, Gough, & Trollope, presumably on the advice of the assessor, Mr. Thomas Worthington. In the conditions of the competition there were two clauses relating to the cost of the buildings, and in view of recent developments, the exact wording of these clauses is interesting. One of them runs as follows:—"The Guardians are of opinion that the designs should provide the requisite accommodation at a cost not exceeding 130*l.* per bed for the buildings, including boundary wall, boilers, machinery, fixtures, and fittings." The other clause states that "designs shall be excluded from the competition . . . if the assessor should determine that the probable cost of carrying out the works will materially exceed the outlay estimated by the competitor." These clauses, it will be seen, did not impose a definite limit to the cost; the Guardians merely expressed an opinion that 130*l.* per bed would suffice, and only contemplated the exclusion of designs the "probable" cost of which might "materially" exceed their authors' estimates. The assessor named in the conditions was clearly intended to be the sole arbiter as to the interpretation of these indefinite clauses, and the very fact that the premiums were awarded shows that he did not think that the probable cost of the accepted designs would materially exceed the estimates. The Guardians clearly do not think that it is even yet too late to discuss the question of cost, and some of them go the length of construing the "opinion" expressed in the conditions as a definite stipulation. At the meeting on Monday the Workhouse Committee recommended that the sixteen sets of plans received in the competition should be submitted to another assessor, namely Mr. P. Gordon Smith. A letter from Mr. Smith was read in which, after stating that his fee would be 150 guineas, he declared that "the limit of 130*l.* per bed was so low that he doubted whether they could erect a hospital for 322 beds and administration for 500 patients at that price."* An amendment was moved by one of the Guardians that the plans keeping within the 130*l.* limit, "with the addition of those of Mr. Ward, of Birmingham," be reconsidered by the Board. This was lost by the casting vote of the Chairman. "Amendment after amendment was moved, but no headway could be made, and eventually Mr. Clarke gave notice of motion that the whole of the plans should be superseded by those of Mr. Ward, of Birmingham." There seems to be considerable danger of injustice being done, not only to the authors of the premiated designs, but to most of the other competitors.

The Sewage Question.

ON Monday evening a paper entitled "The Sewage Question During the Last Century" was read by Mr. H. Alfred Roechling, C.E., before the Society of Engineers. The author, following some other writers, distinguishes land treatment as "natural," and the second method as "artificial," but the distinction can scarcely be regarded as accurate. The processes of purification in both cases are natural; the means employed are largely artificial. If crude sewage is turned in large volumes on to unprepared land, a nuisance will inevitably be created. The surface of the land must be carefully prepared, the soil must in many cases be lightened, drains must be laid, special crops must be grown, the flow of sewage regulated, and the most careful management exercised. A sewage farm is to all intents and purposes as artificial as the means adopted in the so-called bacterial treatment, but in both cases natural processes are relied upon for effecting purification. Mr. Roechling appears to us to be somewhat biassed in favour of land treatment. The difficulties connected with it are scarcely mentioned, and nothing is said as to the enormous areas of land which would be required for the purification of the sewage of some of our largest inland towns, such as Manchester and Leeds, although this difficulty has proved an almost insuperable objection to the adoption of land treatment. Mr. Roechling quotes Dr. Houston's report on the London experiments to the effect that "the effluents from the bacterial beds cannot be reasonably assumed to be more safe in their possible relation to disease than raw sewage slightly diluted;" and speaking of the possibility of diseases being spread by germs passing through the soil into the effluent drains of a sewage farm and thence into streams, Mr. Roechling says: "There is . . . . no case on record where such a thing has actually occurred." Perhaps not, but, on the other hand, is there any case on record where the effluent from well-managed tanks and filters has caused the spread of disease? The fact is that the bacterial character of effluents from sewage farms has not been examined to anything like the same extent as the effluents from filters. Mr. Roechling does not quote a single bacterial test of an effluent from an English sewage farm, but in a paper written in 1896 he confessed that "there are a few sewage farms in existence *on which the sewage is not*

* We quote from the *Manchester Evening Chronicle*.

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purified." This statement is as true to-day as when it was written, and if the sewage is not purified the effluent is impure, whether there is any case of resultant disease on record or not. With Mr. Roechling's observations on the importance of careful and intelligent management of sewage-purification works we heartily agree, and there is wisdom in his suggestion that some "means of educating our future sewage-disposal managers" ought to be found.

Iron Testing. THE paper by Dr. Drysdale describing an instrument for testing the magnetic qualities of an iron forging or casting, which was read to the Institution of Electrical Engineers last week, directs attention to a problem of great importance to electricians. In designing dynamos, assumptions have to be made as to the magnetic qualities of the iron employed, and it is well known to electricians that these qualities are very variable. Two samples taken from castings made from the same steel have been found to differ by as much as 50 per cent. Hence, if exactly similar machines were made from these castings, the output of the one would be 50 per cent. greater than the output of the other. Dr. Drysdale uses a drill of a special form which makes a circular hole of about half an inch in diameter and half an inch deep in the casting, and leaves a circular pin of about a tenth of an inch in diameter in the centre of the hole. By means of a special plug this iron pin can be magnetised and its magnetic qualities determined in the ordinary manner. Dr. Glazebrook criticised the method and pointed out that it only determined the qualities of the surface of the casting. Professor Perry suggested an easy test to settle the question whether the instrument determined the real magnetic qualities of the iron. Mr. Mordey pointed out that the effect of the drill on the iron pin may alter its physical properties. He said that he had noticed that in those electric meters which are controlled by an aluminium disc rotating between permanent magnets there was often a variation in the speed for different positions in the spindle, which was most probably due to slight differences in the physical properties of the apparently homogeneous metal disc. Dr. Drysdale, in his reply, stated that his instrument would enable manufacturers to test and accept or reject castings or forgings immediately on delivery, and would thus enable machines to be designed with far greater certainty. In our opinion, the instrument may be useful for giving rough comparative tests, but it will certainly not supersede the accurate ring methods of Rowland and Ewing.

Bow Bridge. THE bridge at Bow, which is to be replaced with one constructed of iron and 70 ft. wide, was built of granite in 1839-40, and is 40½ ft. wide between the parapets. The original bridge across the River Lea at Bow was built "arched like unto a bow," in the reign of Henry I., by his Queen, Matilda of Scotland, as one of her probably politic benefactions to the citizens of London. Leland records that she had "got well washed in the stream," and, therefore, provided the means for diverting and carrying the main road from Aldgate eastwards across the river and marshes to Stratford, and so into Essex, in lieu of the dangerous passage at Old Ford, a short distance upstream, near the outlet of Hackney brook, which marks the route of the more ancient track into Essex. Matilda also, by one account, caused another bridge to be made across the Channelsea Cut, where is now Stratford Bridge Railway Station, and constructed between the two bridges at Bow and Stratford a causeway, the High-street of Bow, which at this day crosses the Three Mills streams by the two intermediate Pack's Hole and St. Michael's bridges. For maintaining the two bridges and the causeway she bestowed the manor and Wiggen mill upon the Abbess of Barking Abbey.

Islington Parish Church. WE hear that it is now proposed to rebuild the complete fabric of the Parish Church of St. Mary, instead of carrying out the extensive repairs which, in view of the unsatisfactory condition of the structure, had been considered to be necessary. The church, which stands upon the site of the former one, was begun in August, 1751, and consecrated on May 26, 1754, having been erected after the plans and designs of Launcelot Dowbiggin. Its dimensions are 108 ft. in length by 60 ft. in width; it is constructed of brick, with quoins, cornices, and dressings of Portland stone; the stone steeple, with the vane, rises to 164 ft. For the repairs executed in 1787 a curious scaffolding of wickerwork, having a staircase within, was built up around the tower and spire, for 20*l.*, by Bird, a basket-maker of St. Albans. Of that scaffolding there exist contemporary views, one being drawn and engraved by M. Skinner, of Islington.

Hogarth's House, Chiswick. WE are exceedingly glad to be able to report that Hogarth's House at Chiswick, instead of being sold as builders' material, was purchased for 1,500*l.* at the auction last week by Colonel Shipway, a resident at Chiswick, with the view of permanently preserving it as a historic relic. Views of the house will be found in the *Builder* for February 8, 1890, and June 22, 1901, the latter from a sketch by Mr. R. W. Paul.

The Society of Arts. ON Wednesday, at the Society of Arts, Mr. Herbert Stone gave a lecture on a subject which he has evidently made his own, the study of the structure and formation of wood as seen in thin sections examined microscopically. The lecture was unfortunately not by any means audible to all the audience, and a good deal of the information intended to be conveyed in it was consequently lost; but the series of lantern slides of magnified sections of various woods were beautifully got up, and of the greatest value and interest in themselves, apart from the lecture.

Ceramic Art. ON November 30 Mr. Walter Gandy, of Messrs. Doulton, delivered a lecture on "Decorative Ceramics" to the Builders' Foremen's Association at the Memorial Hall, E.C. Mr. Gandy prefaced his lecture by a brief outline of the history of ceramics from the earliest pottery of Egypt and Babylonia on to the Persian period, and laid stress on the great influence of Holland in the development of salt glaze so evident in the ceramic ware of to-day. The baking difficulties are the most serious troubles of the potter in preparing material for architectural use, and the lecturer emphasised the necessity of the most carefully detailed full sizes being supplied by the architect, these being enlarged to a given scale by the potter's draughtsmen to allow for shrinkage. The varying shrinkages of different clays must be also considered, and as colour is dependent on these, any alteration in the colour scheme at the last hour is often productive of great expense and delay. The difficulty of retaining certain colours—espepecially bright red—when baking at a high temperature precludes that freedom of colour handling which exists in paper designing. Mr. Gandy rightly maintained that to be successful the colours must be simple and few, and the success of ceramic decoration depends on the simplicity of the general colour scheme. Messrs. Doulton showed an example of their stoneware polychrome, a very highly polished ware for external use, the effect of which is doubtful, judging from the sample, which was very badly chosen. A painted tile, of vitreous frescoe shown was extremely interesting, in so far as all the quality of the painting was retained and burned on to the tile, which, however, was only suitable for internal use.

Japanese Art. AN exhibition and sale of Japanese ivory carving, embroideries, and screens was held during the week at Willis' Rooms, St. James's. We should like to see a representative collection of Japanese art in London—some such exhibition as the superb collection that was to be seen at the Paris Exhibition last year. To our mind Japan was easily first in the modern art section of that exhibition, not from the poor representation of other countries, but from the vitality and fire, apart from exquisite workmanship, that distinguished their work. The present small exhibition at St. James's exhibited notable work, specially among the ivory carvings. The statuette of Kwannon by the late Ono Hakujitsu is a most remarkable ivory carving standing 2 ft. 2 in. high, with elaborate trappings. It is a wonder that art survives so much painstaking detail—it occupied the artist three years of his life—but you have to look no further than the goddess's face to be attracted to the work. A pair of pigeons and young by Mitsukazé is a fine piece of carving, as is also a kneeling lion by Ishikawi Komei, now artist to the Emperor of Japan. The embroidery was characteristic—composition, colour, and workmanship the most usual combination—but, of course, the exhibits were fewer and less remarkable than those at Paris last year.

Society of Painters in Water-Colours. THE winter exhibition of the Society of Painters in Water-Colours is one of the best we have ever seen. When these winter exhibitions were first established they were professedly for "sketches and studies"; and while this limitation was soon overlooked by a good many members, who contributed finished drawings, the liberty to be represented by sketches still remains, and enables some members to give us interesting examples of their work in this lighter and broader manner. Nothing of

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the kind could be better in its way than Mr. Thorne Waite's landscape under the title "A Rapid Sketch" (107), and equally good in the same way is his study called "An English Homestead" (61). Mr. Albert Goodwin's devotion to his art is attested by no less than thirteen beautiful studies, chiefly of city scenery or buildings, pre-eminent among which are the view of Milan Cathedral in twilight, with the pinnacles just touched by the last rays of the sun (41), and his grand composition on a small scale, "Sunset from the Makalton Hills, Cairo" (236). Mr. Herbert Marshall seems a good deal possessed by Mr. Goodwin's spirit; at all events, whether intentionally or not, his present treatment of city scenery, in some of his smaller works, bears a curious resemblance to Mr. Goodwin's effects. Mr. Cuthbert Rigby is well represented, and Mr. Colin B. Philip exhibits a fine bold example of his power in treating hill scenery, in "High Crag, Buttermere" (172). Mr. Charles Davidson's "Clouds" (128), in a very different way, is a fine and unusual landscape showing a broken cloudy sky above a stretch of moorland. Among other landscapes that may be especially mentioned are Mrs. Allingham's "Berkshire Cottages" (247); Mr. Thorne Waite's "Cornfield in the West of England" (213), a large work with a very fine distance; Mr. Allan's "Return of the Fishing Fleet" (96); Mr. Waterlow's "Across the Meadows to Christ Church" (144); and Miss Butler's "The Four-Horse Thrasher" (184) not so much a landscape as a farm scene, but an admirable little picture. Among works rather out of the usual line of the exhibition and of special interest for their artistic qualities are Miss Barton's interior with a figure of a small child, under the title "A Cold Day" (141), a thing which is just a composition and nothing more, but full of artistic quality; Mr. Anning Bell's rather curious work "The Bathers" (92), in which the nude figure looks strangely flabby and woebegone, but which as a whole is a remarkable piece of colour and composition; and a very highly finished little interior and figure, with a quotation from Herrick for title (88), by Mr. Walter West, a name we do not remember here before, but whose work will certainly be looked for in future exhibitions. Mr. Lionel Smythe's study of "A Boulogne Fisher Girl" (75) is a bright piece of work, and Mr. Edwin Alexander's "Chameleon" (73) a very clever realistic study. Architectural subjects are rather largely represented; besides a number by Mr. Goodwin and Mr. Marshall, already referred to ("Chartres" is the best of Mr. Marshall's), we have a large and fine drawing of the "Castle of Jean Dunois at Chateaudun" (193) by Mr. T. M. Rooke, who also sends an excellent "study of sculpture, as yet unrestored" on the north porch of Chartres Cathedral; Mr. S. J. Hodson gives us the "Tower of S. Ouen, Rouen" (49: the facts without the poetry of the architecture); Mr. Reginald Barratt "The Courtyard at Cordova" and "The Interior of the Mosque" in the same city (54, 55), which we may regard as professedly architectural drawings rather than studies in water-colour, but they are excellent of their kind; Mr. Robert Little has a very good drawing of the interior side of the gateway in the quadrangle at St. John's, Oxford (146); Mr. Allan gives us the "Clock Tower, Auxerre" (198) but his "spotty" manner does not lend itself too well to architectural subjects; and the numerous subjects by the veteran artist Mr. Callow (the oldest member we believe of the club), if a little old-fashioned in manner, are in precision and drawing as good as ever, and take back our associations not unpleasingly to the taste of a former generation of artists of whom he is one of the few survivors.

LETTER FROM PARIS.

THE official lunch offered annually by the President of the French Republic to the winners of the Prix de Rome was given this year at the Elysée in honour of MM. Jacquot Defrance, Bouchard, Hulot, and Caplet. The Minister of Public Instruction and Fine Arts, the director of the Ecole Française à Rome (M. Guillaume), and the director of the Ecole des Beaux-Arts (M. Paul Dubois), and M. Bonnat were present at the lunch.

The question of the ornamental entrances to the stations of the new Metropolitan Railway has been the cause of a little scandal in official circles. It will be remembered that as a result of a competition between sixty architects the Municipal Council selected M. Hector Guimard as the architect for all the future stations, and M. Guimard, who is a fervent advocate of a modern style of art, has up to the present designed all the existing stations in a manner which has given entire satisfaction to the Council, although to some tastes the style of these erections is rather too modern and gaudy. The Railway Company has been endeavouring to obtain the adoption of the designs of an official architect for the future stations, but the Municipal Council has firmly decided that no other than M. Guimard shall design the stations, not only because they wish to respect their former decision, but because it is desirable that the aspect of the stations should be the same for all the lines of the railway.

The competition for the abattoirs of Soissons has been won by M. Felix Piat, architect at Paris.

The subversive ideas of M. Tony Garnier, a pupil at the Villa Medicis, who, it will be remembered, sent home for exhibition at the Ecole des Beaux-Arts, a few months ago, designs and ideas which were much too modern for the spirit of the school teaching, resulting in the exclusion of his drawings, have already found favour in some circles, and a meeting, presided over by MM. Alfred Bruneau and Frantz Jourdain, was held a few days ago to protest against the classical spirit of the official teaching of art in France. The meeting was a very noisy one, and ended in much tumult; but M. Jourdain was able to relate the Tony Garnier incident, and to declare that M. Garnier was to be praised for his endeavour to free himself from the influence of the Ecole, "a backward school, hostile to all new manifestations of art."

The commission appointed to consider the question of forming district schools of architecture is now busily working under the direction of M. Henry Roujon, Directeur des Beaux-Arts.

The monument erected to the memory of the school teachers and villagers shot down by the Prussians in 1870 was recently inaugurated at Soissons by M. Legues, Minister of Fine Arts. The architectural portion of the work is due to M. Guilbert, the young architect of the chapel in the Rue Jean Goujon. The figure subjects are the work of M. Hiolin, well known also for his sculpture in the above chapel. The cost of the monument was estimated at about 2,500*l*., but as the public subscriptions did not by any means reach this amount, the architect, sculptor, and builder, by giving up their fees and a portion of the cost of their work, managed to complete the monument with the help of the money already subscribed.

The Municipal Council is discussing the question of lighting the gardens of the Tuileries by electricity, and keeping them open to the public until eleven at night.

The Mayor of the district of Grenelle has sent in a petition from the inhabitants of his quarter requesting public powers to choose the quarter of Grenelle as the site of the reconstruction of the Imprimerie Nationale, in preference to the quarter of Montsouris.

The Place de l'Opéra will very shortly suffer a certain change in its present aspect. The Equitable Insurance Company of the United States proposes to acquire the buildings and ground situated on the angle of the Boulevard des Capucines and the Rue de la Paix for the purpose of erecting an immense building destined as offices for the company. The present buildings will be demolished as soon as the lease expires; in the meantime a competition amongst architects will be opened for plans and designs for the proposed new buildings. According to custom at Paris, the ground floor of the new buildings should—especially at such a frequented corner—be devoted to shops, cafés, or restaurants, but it appears that the company has decided that such establishments would take from the dignity of business offices, and that the ground floor shall consist of offices alone. It is strange that this angle of the Place de l'Opéra is one which has undergone more frequent changes than any other site in Paris.

The competition for the new schools at Ivry has been carried off by M. Pierre Despeyroux, architect, of Paris.

The question of the Cirque des Champs Elysées seems never ending. It has now been decided to accept the terms of the lease proposed by M. Leoncavello, but it is understood that if the sums exacted as a guarantee are not paid within the week following the notification of the lease, the Municipal Council will immediately proceed to pull down the building.

It has been decided to abolish the greater portion of the old Marché du Temple. A public sale by auction will be shortly made of the 2¼ acres of ground and buildings at a starting price of 180,000*l*.

The Municipal Council has voted a credit of 500*l*. for the completion of the Crematorium at Père la Chaise.

An interesting example of modern art, the work of M. Hector Guimard, the architect of the Castel Berenger, and called the "Temple of Classic and Religious Art," has just been inaugurated in the Rue Saint Didier. This large hall, which has been planned to meet the requirements of 200 musicians and an auditory of about 1,200, is designed in the style of modern art dear to M. Guimard. The lower portions of the building are constructed of stone and cement materials, with carefully planned passages for exit in case of panic. The interior of the roof is formed entirely of mahogany trusses rising from the ground floor, and supporting at the same time as decorating the roof, which is lit up by a very large number of tastefully arranged electric lamps, screened and coloured to throw a rather effective light towards the lower portion of the hall. The first-floor gallery, which surrounds the interior of the hall, is most effectively designed. The aspect of the whole is something quite new in the way of public halls.

The scheme prepared by M. Girault for the heating of the Petit Palais by means of a system of steam at low pressure at a cost of 4,300*l*. has been adopted by the Municipal Council. M. Thomas, the architect of the Grand Palais, is about to light the building completely by electricity.

At the Ecole des Beaux-Arts the jury has awarded medals to the pupils of the first class for designs for a "timber ceiling for the large hall of a sixteenth century château," and to the pupils of the second class for plans and designs for "dwellings for the servants of a national palace."

An International Exhibition will be held at Lille from May to September next. The architectural portion is entrusted to M. Hannotin, architect, of Lille.

The forthcoming meeting of the Société des Amis des Monuments Parisiens will deal with the following matters: the extreme slowness of the work of placing Paris in a fit state again after the late Exposition; The question of safeguarding the Parisian gardens menaced by the new fiscal law of taxation proposed to be levied on unbuilt property; the new buildings of the Place de la Bourse; the ruins of the Cirque of the Champs Elysées; and the necessity of lighting the Champs Elysées and the Tuileries.

The third line of the Metropolitan Railway is commenced. This will be a transverse line, and will cross Paris from Courcelles to Menilmontant. There will be fourteen stations, and the line will pass under the canal of Saint Martin at a depth of about 20 ft., protected by an arch 4 ft. thick.

M. Carré, Architect to the Minister of Foreign Affairs, has left for Pekin with a view of reconstructing on entirely new plans the French Legation, which was destroyed during the siege.

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The Société des Amis des Monuments Parisiens are endeavouring to obtain the free entrance of the public to visit the interior of that interesting monument of the eighteenth century, the Ecole Militaire, by Gabriel. The members of the Société were enabled to visit the building a few days ago and admire the five magnificent rooms on the first floor, beautifully decorated in the Transition style of Louis XV.-XVI. The Salle des Maréchaux is especially to be admired with its marvellous bronze chimney-piece and the four military pictures by Le Paon. The chapel on the ground floor, surrounded by columns of the Corinthian order, recalls the style of the best portions of the Palais de Versailles.

The Commission Parlementaire d'Hygiène invites the Minister of Commerce to prepare without delay an official set of by-laws concerning the replacing of the use of white lead in painting and similar work by another product less harmful. In the meantime, M. Baudin, Minister of Public Works, has forbidden the use of white lead in all work done for the State.

M. Bouvard has informed the Commission du Vieux Paris that he hopes to restore to the town of Paris the equestrian statue, the work of Pradel, which once surmounted the façade of the Cirque d'Eté of the Champs Elysées. If the old building is demolished, the statue will be placed in the garden to be formed on its site.

The Commission du Vieux Paris hopes to succeed in obtaining the preservation of the famous Hotel de Rohan, menaced with destruction. The secretary of the same Commission has just discovered in the Rue de Montreuil vestiges of one of the last "folies" or country houses which the rich bankers of past times built for their mistresses. This pavilion, called the "folie" of General Titon, still contains a number of very fine painted ceilings and interesting panelling. One of the ceilings, valuable as an artistic piece of work, is also interesting as documentary evidence, for it was here that Reveillon, one of the inventors of wall-papers, installed his studio and workshop in 1787, and his artists drew much of their inspiration for their designs from the ceiling above their heads.

Amongst the new municipal taxes destined to replace the octroi taxes taken off wines and other products is one which is received by much disfavour on all sides, and that is the tax proposed to be levied on gardens and other unbuilt property. On one side the landholders are unwilling to pay taxes on vacant ground or even pleasure gardens which are unproductive of money interest; on another side the art societies complain that this law will have the effect of doing away with many private gardens and open spaces which, although unproductive to their owners, are nevertheless most advantageous to the general aspect of Paris; and on the side of sanitation others contest that the present building laws allow houseowners too much liberty as regards the minimum dimensions of courtyards and open spaces obligatory between and behind dwelling-houses, and that the proposed law will force householders to seek the very minimum of open space in future buildings, and even encroach on garden ground which might otherwise be left untouched. That, on the contrary, all encouragement should be given to property holders to leave as much open space as possible around their houses; that new rules should enforce the leaving of larger courtyards in buildings to ensure a better access of air and light to dwellings; and that special advantages should be allowed to property holders who are willing to leave a large proportion of vacant ground around their buildings for making into permanent gardens. The Commission des Amis des Monuments are taking up the matter very strongly, for such a law would fall very heavily on private houses and museums at present surrounded by much vacant ground—ground which is formed into gardens for the enhancement of the buildings, many of which are of public interest.

The Caserne des Celestins, near the Boulevard Henri IV., is about to be demolished as soon as the new barracks now being erected opposite by M. Jacques Hermant, architect, are completed. The Commission du Vieux Paris is busy over the question of saving from destruction the numerous decorative portions of the old building. A ceiling by Bon Boullongne which decorates the large staircase, erected in the seventeenth century, will be preserved, as well as a decorative pediment, built early in the reign of Louis XV., and some valuable painted consoles, and will be set up in the Musée Carnavalet.

The arrangements for the next Salon are the subject of much discussion among the members of the Société des Artistes Français. The committee of ninety, which comprehends the three sections of Painting, Sculpture, and Engraving, has two proposals before it. One, which proposes to give special favour to all artists who have received decorations and medals, has been at once repudiated, and the existing regulation which limits to 1,600 the number of pictures to be accepted by the Jury of Painting will be maintained. But the critics of the Société observe, not without reason, that with this limitation of number, the artists *hors concours*, and who have a right to two pictures each, could by themselves overpass the maximum limit of numbers. The Société includes also the artists "Médaillés" and "Mentionnés," whose works cannot be refused. These conditions would leave no room whatever for the other members, who are organising meetings to consider and defend their interests, and talk of having another exhibition of "dissidents," for which however they can find no locality. The question is a difficult one, and the majority of the artists not yet become celebrated complain bitterly of the large phalanx of dignitaries of art who block their way. The Société Nationale des Beaux-Arts (New Salon) ignores these contests, and the committee of organisation presided over by M. Carolus-Duran—a more pacific character than M. Bonguereau—will adhere to its old rule of allowing each member of the Société to exhibit six works, grouped together.

We have to record the death, at the age of seventy-three, of M. Rouyer the architect, author of the fine Mairie of the tenth arrondissement, which has been illustrated in the *Builder*. M. Eugène Rouyer was a pupil of Baltard, and an artist of great ability, who in the celebrated competition for the Hôtel de Ville was classed next after the successful competitors MM. Ballu and Deperthes, and to whom Paris owes a good many important buildings. M. Rouyer was a Chevalier of the Legion of Honour.

We have also to record the death, at the age of seventy-four, of M. Isidore Bonheur, sculptor, and brother of Rosa Bonheur. He was the pupil of his father Raymond Bonheur, and obtained medals in the Exhibitions of 1865, 1869, and 1889. He was the author of numerous large and vigorous works in animal sculpture; among which may be mentioned the two lions for the front of the Palais de Justice.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A BUSINESS meeting of this Institute was held on Monday at No. 9, Conduit-street, Regent-street, W.

The minutes of last meeting having been taken as read, the results were read of the November examinations. The following are the results:—

A Preliminary examination, qualifying for Probationership R.I.B.A., was held simultaneously in London and the provincial centres indicated below on the 5th and 6th ult. One hundred and eighty-eight candidates were admitted, and thirty-seven were exempted from sitting. The remaining 151 were examined, with the following results:—

	Passed.	Relegated.	Total Examined.
London.....	59	15	74
Birmingham..	8	3	11
Bristol	7	3	10
Exeter	3	4	7
Leeds	20	6	26
Manchester ...	17	6	23
	114	37	151

The following are the names of the successful candidates, together with those exempted, making a total of 151 newly registered probationers:—

W. L. Allen, Regent's Park, N.W.; F. L. Atwell, Plumstead, S.E.; H. J. Axten, Crouch End, N.; C. H. Barlow, Widnes; J. J. Beck, Doncaster; A. L. Belcher, Brixton, S.W.; W. T. Benslyn, Oldbury, near Birmingham; H. E. Bernton-Benjamin, Windsor; A. Bolton, Bingley; A. Boulton, Dundee, N.B.; T. Brameld, Hull; J. E. G. Burroughs, Bristol; H. Carnelley, Barnsley, Yorks; W. Carver, London; E. S. Charlton, Tunbridge Wells; H. G. Cherry, St. Albans; C. Chippindale, Harrogate; H. H. Christie, London; W. T. Clark, Birmingham; W. T. Clarke, Liverpool; R. H. Cochrane, Dublin; J. Cocker, Timperley; G. S. Cockrill, Great Yarmouth; H. R. Collins, Exeter; A. S. Constable, Stocksfield-on-Tyne; W. H. H. Cooke, Stroud; A. Cooper, Rickmansworth; F. C. B. Dabbs, London; G. F. B. Daniell, London; J. S. B. Davidson, Aberdeen; A. H. Davis, London; F. M. Dean, London; D. W. Ditchburn, Leytonstone, N.E.; A. H. Douglas, Maida Vale, W.; A. H. Douglass, Morpeth; G. B. Dransfield, Barnsley; W. T. Duncan, Rochdale; A. Dunn, Birmingham; E. S. Edmonds, Stamford; A. H. Edwards, Leicester; A. C. M. Edwards, Rickmansworth; E. S. England, Blackpool; H. L. Etherington-Smith, Putney, S.W.; E. W. C. Faulkner, Freshfield, near Liverpool; W. G. Fearn, Clacton-on-Sea; H. Fielding, Accrington; A. H. Fitz-Roy, Lincoln; F. B. Foster, Leamington; H. J. Fox, Stamford-hill, N.; D. S. Gardner, Weston-super-Mare; J. H. Goodchild, Crouch End, N.; B. R. Gribbon, Leeds; A. H. Gully, Bedford; R. W. Gunson, Manchester; B. G. Gwyther, Egham, Surrey; G. Hanson, Bradford; F. H. Healey, Bradford; J. H. Higgs, Leicester; H. H. Hill, Liverpool; J. R. Hobson, New Eltham; J. N. Horsfield, Jun., Kingston-upon-Thames; W. H. Huckvale, Tring; A. H. Kirk, Pall Mall, W.; F. R. Jolliffe, Penarth, Glam.; B. W. Jones, Bexhill; G. H. Jones Cardiff; Leon de Barr Kelsey, South Kensington, W.; A. W. Kenyon, Sheffield; A. S Killby, Highbury; C. U. Kilner, Bayswater, W.; S. J. Lampshire, Devonport; A. A. Langham, Wimbledon, S.W.; H. Langman, Southport, Lancs; H. B. Laycock, Manchester; H. G. Lay, Wellingborough; T. Linton, Leith; J. H. Lowry, Liverpool; P. J. Maffey, Southampton; E. H. N. Major, London; H. W. Markwick, Devonport; R. H. Mason, Birkenhead; F. J. Matthews, Clapton, N.E.; M. G. St. J. Maule, Huntingdon; F. C. Mears, Edinburgh; E. H. Mills, Shrewsbury; H. G. H. Mills, Southsea; A. M. Millwood, Barnes, Surrey; E. Milnes, Rochdale; S. W. Mobbs, Lowestoft; E. Morley, Bradford; P. W. Mulready, Brondesbury, N.W.; F. T. Negus, Woburn, Beds.; W. H. Nevell, St. Albans, Herts; G. E. H. Newbold, Gainsborough; J. Norquoy, Manchester; D. M. O'Connor, Southall; S. S. Parkinson, Gravesend; G. Pemberton, Edgbaston, Birmingham; G. E. Peto, Bath; G. E. Phillips, Cambridge; A. P. H. Pierce, London; A. E. Poley, Hampton Hill, Middlesex; W. D. Quirk, London; N. L. Read, Leicester; A. G. E. Rebbeck, Frome, Somerset; H. J. Roberts, Portmadoc; R. G. Roberts, Doncaster; A. H. Robinson, Birmingham; B. Royce, Leicester; W. P. Rylatt, Hull; H. Shackleton, Keighley; W. H. Shute, Newport; E. H. Smith, Leicester; J. W. Smith, South Hampstead, N.W.; J. C. Smythe, Plymouth; R. G. Stevens, Bromley; J. D. Stevenson, Redhill; R. Stockton, Stockport; R. Stokoe, Sunderland; H. S. Stowell, Croydon; P. M. Stratton, Salisbury; L. W. Taylor, Newcastle-on-Tyne; C. E. Tebbs, Upper Tooting, S.W.; F. W. Tempest, Sutton-in-Ashfield; E. E. Temple, Upper Norwood, S.E.; C. à Beckett R. Terrell, Tonbridge; R. A. Thomas, Gosport; M. Thompson, Doncaster; G. M. Trench, East Dulwich, S.E.; J. R. Truelove, Sheffield; R. F. Tucker, Upper Teddington; J. T. Turner, Wanstead, Essex; H. G. Turner, South Croydon; M. J. Wadsley, Hull; P. F. Warren, Norwich; A. J. Watson, Newcastle-on-Tyne; B. Watson, North Shields; R. F. Wheatly, Bromley, Kent; H. E. White, Birmingham; R. W. White, Kentish Town, N.W.; A. H. Whyte, Kensington, W.; T. S. Wilcockson, Chesterfield; L. Wilkinson, New Southgate, N.; H. A. Willatt, Nottingham; E. J. Williams, Leicester; J. R. Wills, Derby; R. H. Willson, Kingston-on-Thames; J. D. Winder, Wandsworth Common, S.W.; A. T. With, Anerley, S.E.; W. O. Wright, Morecambe; J. A. Yells, East Dulwich, S.E.

The Intermediate Examination, qualifying for Studentship R.I.B.A., was held simultaneously in London, Bristol, Leeds, and Manchester, on the 5th, 6th, 7th, and 8th ult., with the following result:—

	Number Examined.	Passed.	Relegated.
London.....	52	29	23
Bristol	9	5	4
Leeds	7	3	4
Manchester	11	8	3
	79	45	34

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The following are the names of the passed candidates given in order of merit as placed by the Board of Examiners :—

A. Scott, Glasgow ; C. M. Crickmer, Regent's Park, N.W. ; H. W. Asman, Bradford ; W. F. C. Holden, Cambridge ; C. H. Brightiff, Southampton ; W. J. Freeman, Halifax ; A. Gilpin, Bristol ; E. L. Hampshire, London ; V. C. Cook, Wolverhampton ; D. Anderson, Hampstead ; J. E. Mundell, Litton, Poole, Dorset ; C. B. Cleveland, Cambridge ; B. D. Tracey, Camden-road, N.W. ; J. H. Taylor, Battersea ; J. Wilcock, Bradford ; C. P. Moss, Crouch Hill, N. ; H. Slater, Preston ; K. D. S. Robinson, Westminster, S.W. ; C. H. Heaton, Wigan ; H. R. Crabb, Exeter ; W. B. Colthurst, Taunton ; A. R. Crisford, Eastbourne ; P. A. Horrocks, Bolton ; E. M. Ellis, London ; P. R. Strong, Balham, S.W. ; F. Sykes, Manchester ; F. G. Brooker, Peckham Rye, S.E. ; W. T. Curtis, West Dulwich, S.E. ; S. H. Rainforth, Lincoln ; J. W. Jarvis, Birmingham ; H. W. Stone, Taunton ; J. T. W. Brooke, Bowdon, Cheshire ; R. W. A. J. Cosway, Wandsworth ; E. Harding, Brixton Hill, S.W. ; F. F. Hobson, Belfast ; E. R. Kennedy, Belfast ; S. Maddock, Frodsham, Cheshire ; L. Morris, New Brompton, Kent ; B. S. Murphy, Edinburgh ; W. R. Osborne, Swindon ; F. I. M. Owen, Liverpool ; S. H. Penlington, Sunderland ; E. R. Sladen, Bourne End, Bucks ; J. B. Smith, Bedford ; C. J. Thompson, London.

The Final and Special Examinations, qualifying for candidature as Associate R.I.B.A., were held in London alone from the 15th to the 22nd ult. Sixty-two candidates were examined, and the following thirty-seven passed, the others being relegated to their studies :—

C. T. Adshead, Stockport ; S. W. Bensted, Wandsworth Common, S.W. ; E. G. Besant, Cambridge ; A. E. Biggs, Felixstowe ; A. B. Botterill, Streatham, S.W. ; C. A. Broadhead, Nottingham ; H. Busbridge, Plumstead, S.E. ; R. S. Cockrill, Great Yarmouth ; H. L. E. M. De Colleville, Brighton ; W. J. Devlin, Adelphi, W.C. ; W. E. Dobson, West Hampstead ; W. W. Ellison, Erith, Kent ; J. Ewing, Regent's Park, N.W. ; E. L. Gaunt, Ilkley, Yorks ; A. E. Gibbins, Islington, N. ; F. R. B. Haward, Marylebone, W. ; R. E. Hemingway, Nottingham ; A. E. Hughes, Regent-street, W. ; A. T. Hussell, Ilfracombe ; E. W. Lees, London ; E. B. Norris, Birmingham ; L. R. Oakes, West Kensington, W. ; H. F. Ponton, London ; W. B. Rees, Cardiff ; C. H. Reilly, London ; F. G. Richardson, Tufnell Park, N. ; E. G. Rodway, Weston-super-Mare ; G. L. T. Sharp, Barnes, S.W. ; W. Slater, Nottingham ; F. D. Smith, London ; T. M. Smith, Tollington Park, N. ; W. S. Tucker, Newmarket ; A. H. Verstage, London ; J. A. Woore, Derby ; E. L. Wratten, Croydon.

The following shows the number of failures in each subject of the Final :—

I. Design	23
II. Mouldings, &c.	18
III. Materials	11
IV. Sanitation	13
V. Specifications	1
VI. Construction : Foundations, Walls, &c.	11
VII. Construction : Iron and Steel, &c.	10

The Ashpitel Prize.—On the recommendation of the Board of Examiners the Council have decided to award this Prize to Mr. Charles Thomas Adshead [*Probationer* 1894, *Student* 1897], he having most highly distinguished himself in the Final Examinations held during the current year.

Special Prize.—On the recommendation of the Board of Examiners the Council have decided to award a Prize of Books of the value of 10*l.* to Mr. F. Dare Clapham, in recognition of the merit displayed by him in his work at the Special Examination held last June. Mr. Clapham obtained the highest number of marks ever awarded at the Final and Special Examinations.

The following candidates for membership were then elected :—

As *Fellows*—Messrs. B. E. Baily, Nottingham ; John Begg, Consulting Architect to the Government of Bombay, of Bombay ; John Cash, Oxford-street, W. ; H. E. Farmer, Walsall ; Henri Favarger, of Cairo Egypt, and London ; J. H. W. Hickton, Walsall ; F. E. Masey, Capetown ; M. B. Price, Pietermaritzburg, Natal.

As *Associates*.—Messrs. T. W. Aldwinckle, London ; H. Allberry, Dublin ; J. P. Bishop, London ; C. H. E. Bridgen, London ; H. Cayley, M.A. Cantab., London ; F. D. Clapham, Eltham, Kent ; W. B. Dawson, Westminster ; H. D. Day, Godalming ; W. M. Dean, Strand, W.C. ; L. G. Detmar, Sutton ; T. N. Dinwiddy, London ; L. W. Ensor, Sheffield ; K. Gammell, Strand, W.C. ; L. C. Gregory, London ; C. L. Hall, Blackburn ; J. P. Hall, Kensington, W. ; S. J. Halse, Canterbury ; G. R. C. Harding, Lincoln ; A. Holstead, Alnwick ; E. V. King, South Shields ; A. G. R. Mackenzie, London ; E. G. Page, London ; A. Pickup, Blackpool ; L. E. Pryke, London ; E. J. Pullar, London ; A. H. Roe, Forest Gate, E. ; R. B. Rowell, Colchester ; C. Stretton, Leicester ; J. G. Walker, London ; R. C. Wrinch, Ipswich.

As Hon. Corresponding Members.—Senor Don Enrique Mariá Repulles Y Vargas, President of the Central Society of Spanish Architects, of Calle de San Agustin 3, Madrid ; Senor Don M. Alberto de Palacio, Madrid.

Mr. Lacy W. Ridge then moved the following motion, which was agreed to :—

"That the Royal Institute of British Architects desires to thank the Local Government Board for the issue of 'Model By-laws, IV. (Rural Districts).' While doing so the Royal Institute would urge on the Board the desirability of preparing a model to enable Rural District Councils to regulate party-walls as distinct from external walls, a matter for which the Urban Model By-laws, to which the Board refer them, are not available. The Institute grounds this on the belief that the existence of properly constructed party-walls has proved an efficient barrier to the spread of fire, and that it is undesirable that such protection should be withdrawn in places where it has already existed."

The following motion by Mr. H. D. Searles-Wood was also carried :—

"That this Institute urges the Local Government Board to promote a Bill in Parliament to embody those sections of the London Building Act, 1894, which apply to ownership and the mode of dealing with party-walls, and make them apply to the United Kingdom."

A motion by Mr. Herbert W. Wills :—

"That, in the interests of the profession, it would be advisable to have a list of 'Institute Assessors' drawn up, from whom the President would nominate, and that this list be from year to year revised," was withdrawn.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary fortnightly meeting of this Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. W. H. Seth-Smith, President, in the chair.

The minutes having been read and confirmed, Messrs. E. G. Dawson, D. N. Paddon, and A. Pomeroy were elected members of the Association.

Mr. R. H. Weymouth was then elected to fill the vacancy on the Committee caused by the appointment of Mr. A. T. Bolton to the position of Master of the Day School.

Mr. R. S. Balfour announced the following donations, viz., "A History of Architecture on the Comparative Method," by the late Professor Banister Fletcher and Banister F. Fletcher ; and twelve photographs of cathedrals, presented by Messrs. Bolas.

The New Premises Fund.

A vote of thanks having been accorded to the donors,

The Chairman said he was glad to be able to announce the following additions to the New Premises Fund :—The Architectural Association, 1,000*l.* ; Messrs. Basil Champneys, 50*l.* ; H. T. Hare, 50*l.* ; E. W. Mountford, 50*l.* ; Ernest George & Yeates, 50*l.* ; John Belcher, A.R.A., 25*l.* ; Beresford Pite, 20*l.* ; E. Guy Dawber, 12*l.* 12*s.* ; R. S. Balfour, 10*l.* 10*s.* ; E. M. Gibbs, 10*l.* ; Francis Hooper, 10*l.* ; H. D. Searles-Wood, 10*l.* ; A. Paull, 6*l.* 6*s.* ; W. A. Forsyth, 5*l.* 5*s.* ; A. H. Hart, 5*l.* 5*s.* ; H. P. G. Maule, 5*l.* 5*s.* ; C. B. Bone, 3*l.* 3*s.* ; J. H. Squire, 3*l.* 3*s.* ; F. D. Clapham, 2*l.* 2*s.* ; W. H. Raffles, 2*l.* 2*s.* ; G. L. S. Sharp, 2*l.* 2*s.* ; H. Teather, 1*l.* 1*s.* ; E. F. Reynolds, 1*l.* 1*s.* ; A. O. Collard, 1*l.* 1*s.* ; P. J. Turner, 1*l.* 1*s.* ; and Stanley Towse, 1*l.* 1*s.* Mr. Belcher's donation was accompanied by a promise that as soon as the matter was well in hand he would be glad still further to assist them, and, said the Chairman, no doubt there were others who would do the same. He (the Chairman) wished that there had been more guinea donations, for he had more hope in a large number of small donations than in a small number of large ones. Small contributions would show that the scheme was being supported by the general body of members, and that, of course, was what was wanted, for the Committee desired to know that the members were thoroughly in sympathy with the movement. It was not a matter of ambition—*i.e.*, that they were trying to get a fine building ; it was simply a matter of absolute necessity. The lease of the present premises had about two and a half years to run, and the Association must be prepared to give notice and go into new premises at the end of that time, or take the present premises for another seven years, and if they had to take the second alternative the work of the Association would be seriously handicapped. He hoped that the members would do all they could to augment the fund, and that they would remember that it was much easier to get the first 5,000*l.* than the additional 15,000*l.* required. Therefore, although they had every reason to be greatly encouraged by what had already been done, they could not but regard the future with some concern. The Committee counted on the enthusiasm of the members in the matter, and they felt they had it, but he hoped that as many of them as possible would show their hearty support in a practical way by collecting, if they were not in a position to give, something towards the fund. The smallest sum would be welcome, or promises of help—for the money was not necessarily needed at once, though the more they could get together at once the more they would receive in the way of interest. They might begin to build in 1903 ; but in any case they had a great deal to do between then and now.

Capitals, &c.

The Chairman said that Mr. Arnold Mitchell had very kindly undertaken, at short notice, to deliver an address that evening on "Capitals," in place of Mr. Bond, who, unfortunately, was too unwell to keep his engagement, and had been compelled to go to the seaside that day. He (the Chairman) had sent a letter to Mr. Bond expressing their sympathy with him in his illness.

Mr. Arnold Mitchell then delivered an able lecture on "Capitals," or, rather, on the Triforia of English Cathedrals, Tympana, Sculptures, and Capitals, illustrated by a large number of lantern views. As the light was extinguished during the lecture in order to show the views, it was impossible to report Mr. Mitchell's remarks in full, but the following notes will give a general idea of the character and scope of the address. He said he addressed his remarks chiefly to the younger members of the Association, who, perhaps, up to the present had not given much thought to some of the detail and points of interest of the old buildings about which he was going to speak. From the pictorial point of view, was there anything more beautiful than some of our old buildings—than the cloisters at Salisbury, for instance, with the beauty of colour which the photograph could not show ? And if these old buildings possessed interest from the pictorial point of view, how much more interest was there in the detail—in such work, for instance, as Bishop Bridport's tomb at Salisbury ? Had we not in our English churches detail which equalled or surpassed in interest and beauty any foreign work ? It seemed to him that the study of detail was really the most interesting study in mediæval buildings. Take a view of part of the interior of Lincoln Cathedral—the triforium. The triforium in these old mediæval buildings was part of the design which received great thought, and he would like to put before them a short series of views of triforia showing how the design grew and developed. The chief interest in these questions was to see how the builders began from the simplest and most elementary forms, and then gradually worked out those magnificent designs which were produced from the thirteenth to the fifteenth century. In the study of architecture we must realise that no composition was the sudden inspiration of the builders who produced it, but that it was the gradual outcome of what had gone before. Consequently, it was very interesting to trace out the process which

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gradually led up to those perfect examples of the Middle Ages.

One of the simplest and earliest of these triforia designs was to be found in Winchester Cathedral. Here could be seen the very beginnings of the Norman period, when the work was crude, elementary, and simple, and when the builders had all to learn and so little upon which to go. They began with the most simple and elementary forms—as, for instance, in the plain ring of stones in the outer and inner arches of the triforium. Even in the tympana there was the same simple use of the stones (for the builders had also to learn how to work and dress the material they used), the crude workmanship, and the wide mortar joints. At Chichester, a few years later, a great improvement was noticeable. In the outer arches of the triforium there was a plain moulding on the stones; and in a simple manner, but so as to produce an impressive effect, the rings of small stones of which the arch consisted were built up and recessed one behind the other. In examining Norman detail and ornament they would see in what an extraordinary way the builders made it tell with the minimum of labour. In the earliest examples, where they dispensed with mouldings altogether, it was remarkable what an amount of effect the builders got merely by recessing those rings of stone one behind the other, and so getting a great architectural effect of light and shade under the recessed rings of stone. The builders in these first examples of architectural history built with an enormous waste of material, simply because they had not learnt what the materials would do for them. It was only in later years that they learnt the advantages of worked stone and dressed beds of masonry. There were thirteenth-century buildings as high as Norman buildings with not one half of the masonry in them, simply because the builders had learnt how to use with advantage the material they were employing. In the tympana of the triforium at Chichester the builders had produced an effect of enrichment in the diaper use of the stones with absolutely no expenditure of skilled labour, but by the simple arrangement of the stones—by taking a square stone and turning it up on edge. Instead of the expenditure of labour, they expended their brains and got this effective result.

In a little later example, at Peterborough, there was the same treatment of the arches of the triforium, and in the tympana there were the diaper patterns, but on the lower edge there was an idea of relief work—an incised ornamental treatment, which was a distinct advance.

Then at Rochester there was a further advance—the same treatment really, but further elaborated. The tympana were enriched by the diaper pattern again, but on each stone there was cut a little low incised ornament which, multiplied throughout the design, gave a very original effect; and yet how simply was each stone treated!

In a later period, at Lincoln, there was a still further advance in the piercing of the tympana spaces instead of working on the surface—a new principle by which a strong, black depth of shadow was got in the tympana spaces. What great possibilities were open to the old builders when this idea was hit upon!

In other examples could be seen a widening and an elaboration by mouldings of the openings in the tympana until the whole space was taken up by these piercings. At Ely, for instance, could be seen how the idea was elaborated, and in such examples refinements were got similar to what could be found in Greek work.

A most beautiful triforium was the eastern extension of the choir of Lincoln Cathedral, where the openings in the tympana occupied the whole of the space, and we got a perfect example of triforium treatment. Perhaps the most beautiful of all was the wonderful triforium at Westminster Abbey, with the refinement of design of the base mouldings of the central shafts set out so as to be seen from below level with the mouldings of the columns of the triforium arch.

As to the sculptures in these mediæval buildings, there was always a purpose behind them. It was particularly important to notice that in these early sculpture works the story was told by means of pictorial representation, quite regardless of true proportions. In the representation of the screen, of Noah and the Ark, he supposed, although there was no proportion, yet how well the story was told! The heads of the figures were large and altogether out of proportion to the figures, and yet the facial expression was obtained, and that was the object the builders had in view.

In the Priests' Door at Ely was another distortion of the human body, but the other way about, *i.e.*, the bodies were out of proportion to the heads; if the figures were to stand up they would look ridiculously tall. There was great difficulty in filling the spaces over these doorways with figures, and if we tried to do the work ourselves we felt greater respect for the old builders, and still more when we realised how they were hampered by the material that they had to use. Not only was the space difficult to fill, but there were the coarse materials and the consequent wide joints to be managed, but these old builders managed to get the vertical lines of their compositions, and the wings, for instance, of their subjects, to correspond with the vertical lines of the joints of the stone.

As an illustration of a later period, he would mention the beautiful arcading round the Chapter House of Salisbury Cathedral, which showed the same perfect type of sculpture work of the kind. One of the interesting points was the series of human heads which formed the stops to the label of the mouldings. The fertility of design was wonderful, and he could not think that the builders in producing work showing such fertility of invention and about which, in the treatment of each individual head, there was so much variety, had any ideal representation of the human form as their object as the men in Greek times had. In the heads on the arcading at Salisbury Chapter House, so different in type and expression one from the other, one saw the representations of men of the day who actually posed as models for the occasion—the actual men engaged on the building, most likely. In the sculpture above were representations of Adam and Eve, with the same want of proportion between the figures and trees, &c., which he had already referred to. Another example, also from the Chapter House at Salisbury, was even of greater interest, *i.e.*, a representation of the building of the Tower of Babel, in which there was the same lack of proportion. The tower was a thirteenth century example of a tower, and no attempt was made to go back to Biblical times for the illustration—the builders just depicted the things around them. Work of that kind threw a valuable sidelight on the methods of doing things in those days. For instance, there was the representation of a man carrying a stone on his head: did that not suggest that stones, &c., were raised on to the buildings by manual labour instead of by mechanical means? Then there was a form of ladder to be seen which no doubt represented the kind of ladder used at the time. We might fairly conjecture, he thought, that in that they saw the kind of ladder used at the time the sculptures were done.

As to capitals, he wanted to show the development which had taken place in them. What he had to say would be obvious to most of his hearers, but there might be some who had not given sufficient thought to these fine old mediæval buildings, which, the more they were studied, the more would be found in them. He would go back to the beginning of things—to Anglo-Saxon times. In the little church at Wittering a square block of stone, with no architectural enrichment at all, was used as the capital. He supposed the idea of church capitals originated in a feeling that the juxtaposition of two diverse forms of structure—*i.e.*, the pier and the arch—must be marked in some way, and the capital was adopted as a dividing line. It was particularly interesting to notice how the builders worked out the design for their capitals. A capital was a feature above the eye of the spectator, and any improvement would obviously take place from the point of view of being seen; where the arch springs, the builders wanted to emphasise the springing line; hence the abacus.

At Sompting Church was to be seen the roughest, rudest type of sculpture-work in the capitals, but there was a smoother, more rounded effect, instead of the square, sharp overhang of the last example.

An example from Peterborough, with the abacus projecting, was a more perfect example, and it showed a far better dividing line than in the previous examples. Zig-zag ornament, to which he would draw their attention, was the most interesting of all Norman enrichments, but the actual ornament was exceedingly simple. The more we studied the Old Norman buildings the more we must wonder at the effect their ornament produced, and yet how little labour they put into it! and that was one of the highest of achievements.

From Rochester Cathedral they had an elaborate system of scollop form of ornamentation, but unfortunately some of it had been restored away since the photograph he showed had been taken.

A capital from Steyning Church showed the introduction of a new principle in the concave form of capital instead of the convex, in which the attempt of the builders was seen to adapt the design so that it might be best seen from below. More room for effect from this point of view was obtained by this concave form of capital, for it afforded splendid opportunities for sculpture work. The leaves of the foliage in these thirteenth century capitals stood out from behind in a wonderful way, and this concave treatment was an enormous improvement, from an architectural point of view, upon the convex treatment. There were 2,000 of these beautiful capitals at Lincoln, and not one was like its neighbour! He did not know of anything which so indicated the resource of the builders as the foliage of these capitals, which was absolutely tossed about in the design. The stalks were stiff, but not the leaves. A beautiful example of a capital was that from the little porch of Skelton Church in Yorkshire.

Mr. Arnold Mitchell then showed several views of Norman doorways, in which sculptures were shown. It was wonderful, he said, to what an extraordinary length moulding work could go, giving a maximum architectural effect. A beautiful doorway was that from Lincoln, and some of the most beautiful sculptured doorways were of this period. At Iffley we saw a moulded doorway, with carved beakheads (an explanation of which he would like to have), and in that we had the beginning of sculpture work before we got to the figure stage. In the Priors' door at Ely Cathedral, through which people did not generally go, though it was well worth while doing so, we had a beautiful example of the elaboration of sculpture work on doorways, of which the Norman builders were capable; and at Barfreston was another beautiful doorway. One constantly came across a rich Norman doorway in a building of a different date, and no doubt that was due to the fact that when buildings were altered and enlarged, the doorway was more often retained or incorporated in a new design, than other parts of the original building. At Barfreston we saw the object of these sculptures; people at the time the work was done were incapable of reading or writing, and so the sculpture subjects were introduced for the purpose of speaking forcibly to them.

He desired to direct their attention to the little church of Copford, near Colchester, for if they were to pass that little building without entering it, they would lose a great deal. Not many years ago the church had some interesting frescoes on its nave walls, but the rest of the interior was whitewashed. At the recent restoration the whitewash was carefully removed from the chancel, with the result that there was revealed quite the most finished and beautiful example of colour decoration in a church in the whole country, which, only a few years ago, no one knew existed. In some places the whitewash was something like one-eighth of an inch in thickness. We were so accustomed to see in our churches bare masonry, that we were apt to be amazed to find in a building like the little church at Copford colour decoration so fine. The restoration work had been most carefully carried out, and the frescoes had been slightly strengthened and repaired. The result showed how carefully restoration work should be carried out, and also that they as architects would be well repaid for their care if they got results such as those to be seen at Copford.

The Chairman said one never tired of going into the matters Mr. Mitchell had dealt with, but when a man had mastered his subject as Mr. Mitchell had, and when he had also had considerable experience as a lecturer, it was a real pleasure to hear such an address as they had heard that evening—an address which was not only so interesting, but was of practical importance too. He cordially agreed with Mr. Mitchell's remark as to cost being saved by the application of brains in work, and if architects would only impress the public, and particularly their clients with the belief that they used

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their brains in their work in order to save the pocket of the client, instead of throwing as much detail of a costly nature into their work as they could, they would bring much more credit to the profession, enjoy their work much more and increase their clientele at the same time. As to the refinements in the works referred to by Mr. Mitchell, there was no doubt, as Mr. Reginald Blomfield pointed out in his book on the Renaissance, men like Wren learnt to do their work so much by observation on the spot—by observing the effect of each feature as it was built up, very often varying it from time to time as the result of those observations. Those architects were not paper architects. He recently asked an architect for a donation on behalf of the work of the Association, but unsuccessfully, the architect whom he asked remarking: "I do not agree with paper architecture, and I don't want to encourage paper architects." His, the speaker's, reply was: "Neither do we; we try to make our architectural student a practical architect." In listening to Mr. Mitchell's address, his opinion as to the importance of studying Gothic had been confirmed. In looking at the drawings of Gothic work submitted by students in the Institute examinations, he had been very much struck by the atrocious character of many of them. The sheets of testimonies of study for the Institute examinations were, as a rule, as bad as they could be, and when the candidates were asked why they had chosen such villainous examples when there were such beautiful examples to select from, they usually replied that there was no encouragement in the schools—no examples, no models. The London candidates had not that excuse, for there was the Architectural Museum, and also South Kensington, where there were beautiful examples which students could measure. It was just this: Gothic was out of fashion. We must take care that we did not sacrifice the individuality of our English architecture; we should do so if we dropped the study of Gothic as students of architecture. We found in Gothic what we did not get in Classic, *i.e.*, the freedom which was at the bottom of our English character and which was translated in stone in our English architecture at every period. We needed that spirit of freedom which the study of Gothic could give us, and which resulted in that infinite variety which Mr. Mitchell had mentioned. He was not able to agree with those who argued that in the design of mediæval buildings there was no architect or master mind conceiving the whole, and that it was left to individual workmen, working in some sort of concert, to produce these beautiful works. The more he thought the matter out the less he was inclined to agree with that theory. On the contrary, to him it was absolutely proved that there was a master mind concerned in the erection of those great buildings, though he believed that the individual workman had great liberty in the design of the detail he carried out. In his opinion, the modern architect could obtain much the same happy result if he would only give craftsmen under him more freedom of the same kind.

Mr. Alex. Wood, M.A., in proposing a vote of thanks to Mr. Mitchell, said he had listened with the greatest pleasure to Mr. Mitchell's address, and he had seen with equal pleasure the beautiful lantern views. He did not agree with Mr. Mitchell's remarks in regard to the rather curious floriated carving in the tympana at Rochester Cathedral. It did not appear to be truly Norman work. The sculptures appeared to be a sort of copy, and were not genuine. It was difficult also to see how the eastern part of the crypt at York was genuine Norman work. There was considerable study of Norman work in the fifteenth century, and it looked as though the builders had familiarised themselves with it, and either tooled the old work or did the real thing. The porch at Skelton had been shown as a splendid example of a village church porch, but the tradition of the neighbourhood was that it was done by the masons employed on the transept at York. If they studied Christian's book carefully, they would find that Skelton was not considered a fair example of a village church, *i.e.*, a genuine growth of the village mind, but was rather an importation from a large town. He was glad that attention had been called to the church at Copford, in Essex; it was really a Byzantine church, and had evidently had a string of domes, which were broken up in the early centuries, and turned into an Early English building. The painted work seemed to have a strong Byzantine character about it.

Mr. C. H. Brodie seconded the vote of thanks to Mr. Mitchell for a delightful lecture.

Mr. H. P. G. Maule supported the vote of thanks. He agreed that they could not study Gothic work too much, for even if they did not design in Gothic, they could not get too much of the spirit of the Gothic builders into them. We could not do better than try and get the spirit in which they worked in those days and the joy they put into their work. With regard to the beak heads on the doorways, to which Mr. Mitchell drew attention, he did not know if there was anything in it, but it had occurred to him that in country districts one often saw stoats, and crows, and cats nailed up on barn doors, and after a time nothing was left but the skeleton. In the case of the crow, the part in such circumstances that was most prominent was the beak, and it was just conceivable that in past days some one may have seen this beak nailed upon a door and may have taken a hint from that.

The vote of thanks having been heartily agreed to,

Mr. Mitchell, in reply, said that every one of the photographic views shown that evening belonged to the Association, and had been presented to the Association a year or two ago, and he had used them so that they might get adequately noticed, for they were really splendid photographs, and he did not think that they had been so far properly valued. As to Mr. Maule's point about the beak heads, it had occurred to him while Mr. Maule was speaking that perhaps they were grotesque beasts put round the doorway to frighten away evil spirits; and when it was known what superstitious notions the people had in those days, the suggestion he had made might seem to have something in it. It used to be the fashion in olden days to have, at the time of baptisms, the south and north doors open, the idea being that the spirit of the natural man should leave by the north door and the holy spirit enter and take possession by the other. There might be something in the suggestion; at all events, the beak heads were seldom on the south door. He desired to say another word or two as to the photographs he had shown, and which, as he had said, were the Association property. Owing to the totally inadequate arrangements for properly showing the views upon the screen the views had not been done justice to, and he thought that the Association in their own interests should see that something was done in the matter.

The Chairman said it was true, as Mr. Mitchell said, that the photographs belonged to the Association, but it was entirely due to Mr. Mitchell that they did so. The photographs were presented by Mr. Gardner, thanks to Mr. Mitchell. He quite agreed with Mr. Mitchell's remarks about the screen. It was time they approached the Institute and asked them to join the Association, not only in improving the method of lighting the lantern (for they were always running risks with the bottles of gas), but also in getting a better screen.

The Chairman announced that the next meeting will be held on December 13, when Mr. J. E. Forbes will read some notes descriptive of his Travelling Studentship tour.

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE third meeting of the present session of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, W., on Friday, November 22, Mr. R. H. Weymouth in the chair.

The paper announced to be read by Mr. Vivian H. King being unavoidably postponed till next February, Mr. George H. Smith, Vice-chairman, kindly took his place, and at a few days' notice prepared a paper on "Canterbury Cathedral," which was illustrated by plans, showing its development from Early Saxon times down to the present building, Mr. F. G. Osborne Smith lending his services to show with the A.A. lantern a fine selection of views of the cathedral specially prepared by Messrs. Bolas & Co.

Commencing with the traditions of an old Roman church, the landing of Augustine in 597, and early Saxon times—following a supposed restoration of that early church by Professor Willis—Mr. Smith traced the gradual growth of the present structure, especially calling attention to Archbishop Lanfranc's work in 1070 and Prior Ernulf's in 1093, and the glorious Choir of Conrade destroyed later by fire. In 1170 took place the tragic martyrdom of Thomas à Becket, followed later by his canonisation and the great pilgrimages to Canterbury of mediæval times. William of Sens and his successor in 1189, William the Englishman, and their great additions to the Cathedral, for the most part still remaining, and all the additions and destructions up to modern times, were alluded to, the slides shown at the close of the lecture greatly enhancing its value.

The Chairman proposed a hearty vote of thanks to Mr. Smith and Mr. Osborne Smith, alluding to the wonderful vistas obtained by the flights of steps in the Cathedral. Mr. Tayler seconded, and Mr. Wonnacott supported it, Mr. Wonnacott remarking how studying the vaulting of the Cathedral is most instructive, and, incidentally, how few members were aware of the fine set of slides the Camera Club had of Canterbury. The discussion was continued by Mr. Jacobs, Mr. Dudley Forsyth, and Mr. Barwell. The vote of thanks being carried with acclamation, Mr. Smith replied and the meeting was ended.

The next meeting was announced for Friday, December 6, at 7.30, when Mr. Sydney Perks is to read a paper on "The Ethics of Dilapidations," Mr. Douglass Mathews hoping also to attend as Special Visitor.

COMPETITIONS.

HAWICK NEW LIBRARY.—At a private meeting of Hawick Town Council, on the 29th ult., the plans for the Carnegie Library were considered, and it was resolved to recommend the public meeting of the Council to accept the plan signed "Teviot," by Mr. Scott, of Messrs. Scott & Campbell, architects, Queen-street, Edinburgh.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the Edinburgh Architectural Association was held on the 28th ult. in the rooms, No. 117, George-street, Mr. Henry F. Kerr, president, in the chair. Mr. Louis A. Barnier, B.A., delivered a lecture on "The Old Monuments of Provence." The lecture opened with some remarks on the history of the country, and showed how the influence of Greek and Roman civilisation began earlier and finished later than in the rest of the Gaul, and therefore left a stronger mark on the people, who have ever since preserved an individuality, and have been, so to speak, a nation apart from the rest of the French. Some of the monuments, Roman theatres, amphitheatres, temples, mausoleums, &c., in the following towns were specially mentioned:—Orange, Avignon, Tarascon, and Beaucaire, Arles, Aignes, Mortis, Carcassone, and Nimes. These buildings were also illustrated with a set of limelight views. At the conclusion of the lecture, Mr. Hunter Crawford proposed a hearty vote of thanks to Mr. Barnier for his lecture, which was duly accorded.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on the 2nd inst., Mr. C. Mason, President, in the chair, a paper was read on "The Sewage Question during the Last Century" by Mr. H. Alfred Roechling, C.E., F.G.S. After some preliminary remarks relating to his subject, the author gave a short history of the theory and practice of sewage purification during last century. Concerning its theory, he remarked that from the position of pure instinct, it had advanced through various stages, until at last Pasteur and others had given it that form it now generally took, viz., that in sewage purification, mechanical, chemical, and biological agencies played an important part, and that the decomposition of the organic matter was in the main a biochemical process. Dealing with the practice of sewage purification, the author observed that the only known method of sewage treatment at the dawn of the last century was irrigation on land. He then pointed out how, years afterwards, chemistry had tried to make a lucrative business out of it; how Commission after Commission, and, in fact, every authoritative

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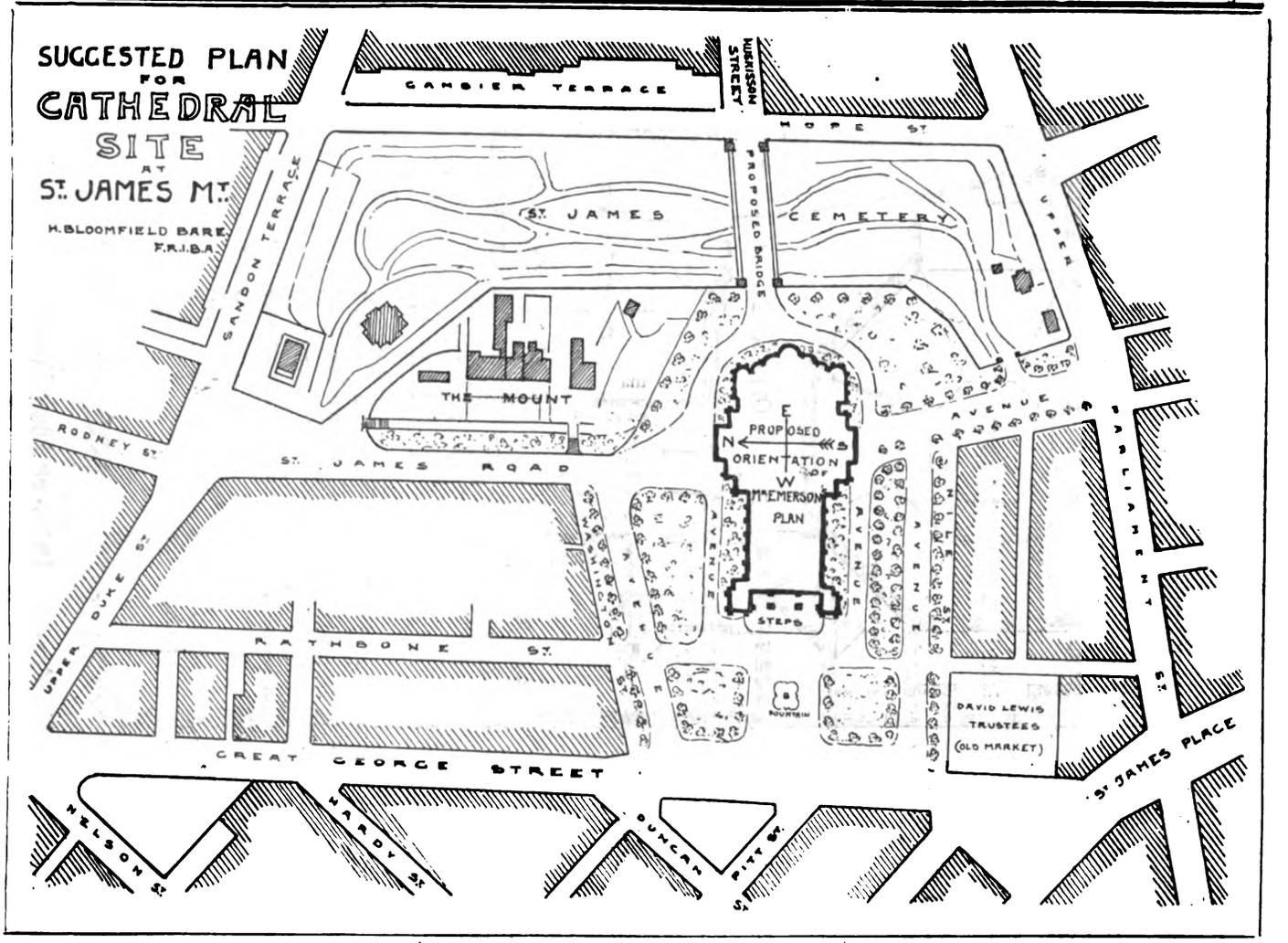

inquiry, had expressed an unmistakable verdict in favour of land treatment; and how, in consequence of this mass of accumulated evidence, the Local Government Board had been compelled to insist on land treatment of the raw sewage or effluent in any scheme of sewage disposal for which its sanction had been asked. But the author observed that even the best of land could not do its work for ever if it was not well looked after; and so it happened that through gross neglect and ignorance, the apparent failures created a strong feeling against land treatment, and finally led to the appointment of a new Royal Commission. This new Commission had just issued its interim report, in which it had re-established land in its position as the first and only natural method of sewage treatment, and had termed all the biological or bacterial methods "artificial," some of which would be admissible without land. The author next referred to the natural self-purification of sewage, or to the self-purification of sewage in the only natural medium, land, and considered in detail the self-purifying powers of land, mentioning amongst other things that besides its retentive and absorbing properties it possessed also the power to decolorise, to deodorise, and to retain and render harmless such poisons as strychnine, nicotine, &c. The self-purifying process, he said, might be likened to a process of digestion, and when the digestive powers of land had been overtaxed, sickness was the only natural result. After describing the work of bacteria in the soil and some products of their activity, the author stated that experience and experiment had proved that the chances of pathogenic germs doing further harm on sewage farms were exceedingly remote. No soil, with the exception of peat—owing to its great amount of moisture—was probably entirely useless, and a loamy sand subsoil had, in many instances, proved very effective. The depth of soil necessary for purification depended on local conditions, such as the character and thickness of the top soil (humus), the nature of cultivation of same, the character of the subsoil, especially its facilities for retaining and exchanging air quickly, the surface slopes of the land, and the level of the subsoil water (thickness of the zone of evaporation, and of the passage and capillary zones). Dealing next with the artificial self-purification of sewage or the self-purification of sewage in artificial media, the author remarked that, apart from the sludge difficulty (which had been reduced, but not altogether removed), these artificial methods had given very fair and encouraging results concerning the chemical purity of the effluent. But whilst warning his hearers not to expect that these theoretical results would be reached in practical working, and incidentally mentioning two cases of failure of works of this kind, he drew attention to the bacterial impurity of the effluent, which was little better in this respect than raw sewage. The Legislature, however, could not contemplate without the gravest concern the wholesale admission of pathogenic germs into the streams, as an action might lie against a Sanitary Authority for causing an outbreak of typhoid fever lower down the stream. After stating that the excessive quantities of manurial elements in the effluents from artificial self-purification works might engender such a luxuriant vegetation in the streams as to obstruct the natural flow of water and to completely cover the whole bed, the author stated that the objections raised led, in the natural order of things, to the supplementing of the artificial methods by the only natural one—land—when all reasonable requirements would be satisfied. It might likewise prove advantageous to partially treat the sewage by an artificial method before using it on the land. No system, however, would prove successful unless the present method of supervision of sewage-disposal plant was radically altered and the education of future managers systematically taken in hand.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on the 3rd inst., Mr. Charles Hawksley, President, in the chair, it was reported that eighty-two candidates had been admitted as students. The monthly ballot resulted in the election of one member, viz.:—C. E. Allan (Belfast), forty-three associate members, and six associates.

THE SANITARY INSTITUTE. — The Secretary informs us that it has been decided not to hold the sessional meeting of the Sanitary Institute on December 11, as given in the calendar in the Supplement to the "Journal."

SUGGESTED MODIFICATION OF THE LIVERPOOL CATHEDRAL SITE.

THE accompanying plan was made by a Liverpool architect, Mr. Blomfield Bare, as an extension and improvement on the site proposed by the Committee for the Liverpool Cathedral. The plan of the Committee's site we gave on page 431 *ante*, though we were not informed at that time as to what portion of the site they propose for the Cathedral. We have since learned that (as we supposed) it is confined to the long narrow portion called St. James's Mount, now laid out as a garden, and that the Cathedral is not to trench on the cemetery. That would of course mean that the Cathedral must be aligned north and south.

Mr. Bare suggests acquiring more land to the west of St. James's Mount, and placing the cathedral as shown on his plan. This is undoubtedly an improvement, but it would be costly, and it would still leave the cathedral in an out-of-the-way position and facing a poor collection of second-class streets; and Great George-street, which would run past it, though a wide street, is not an important thoroughfare. There is also a great fall of the ground westward, which would necessitate, we should think, a more extensive flight of steps than is indicated in Mr. Bare's plan.

Though we publish the plan as a clever attempt at a new solution of the problem, we are as far as ever from approving of this situation for the cathedral; and we believe that, in spite of the declaration of the committee that they will abide by their intention, they will be met by such a systematic opposition to it in Liverpool as will probably compel them to give way.

POST OFFICE, COLWYN BAY.—New post office buildings have been designed by Messrs. Booth, Chadwick, & Porter for Colwyn Bay, the cost being estimated at 4,000*l*. The plans have been approved by the Postmaster-General and the Treasury. On the ground floor will be a large public office, the Chief Clerk's room, messengers' room, and sorting-rooms; the first floor will contain the Postmaster's office; and the second floor the telephone and telegraph instrument rooms. It is a four-story building, and will consist in the main of buff bricks and terra-cotta dressings.

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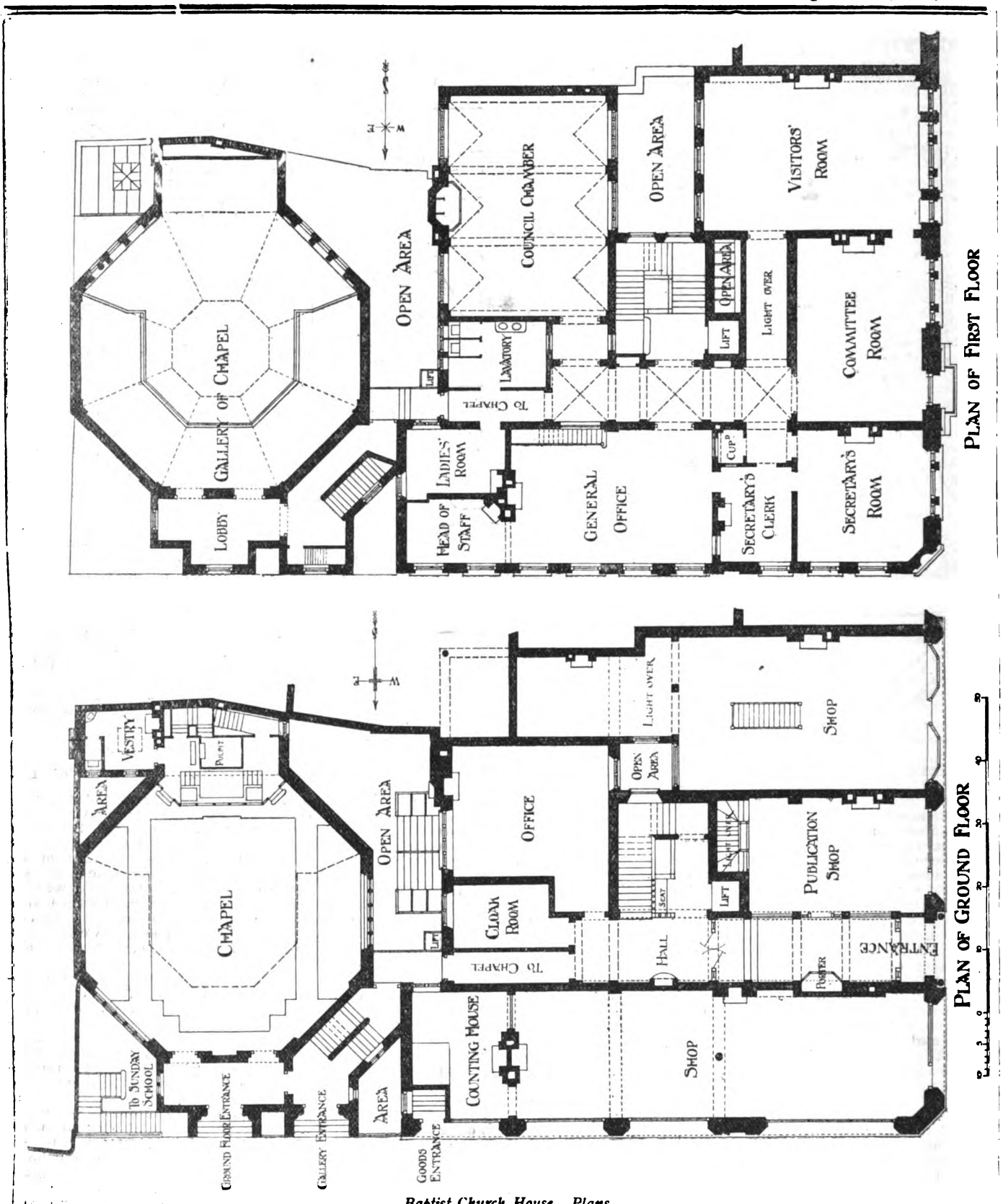

Baptist Church House. Plans.

Illustrations.

THE BAPTIST CHURCH HOUSE.

THIS building is being erected in the widened part of Southampton-row which forms the beginning of the new street from Holborn to the Strand, and it is the first building to be started in the street.

It forms the headquarters of the Baptist Union, and on the ground floor there is a large shop for the publication department of the Union. The site was partly occupied by the old Kingsgate-street Chapel, and a new chapel is being built to take the place of that building.

It was at first proposed to build a library over the chapel, and the octagonal form shown on the plan was adopted to get over difficulties of lighting. Some arbitrary divisions of the site that had to be adhered to made any regularity of treatment in the street front difficult, and therefore I have tried to group the various features so as to get balance and composition without too much regard for symmetry or classical conventions.

A small first contract was carried out by Messrs. G. S. S. Williams & Son, and the main building is now being built by Messrs. Higgs & Hill.

ARTHUR KEEN.

SELECTED DESIGN FOR NEW MANCHESTER FIRE-STATION.

WE give this week the two principal plans, and two elevations and two sections, of the design by Messrs. Woodhouse & Willoughby to which the first premium has been awarded in this important competition.

We commented on the design at considerable length in our last issue, and it hardly requires any further explanation.

The object of the architects has been to combine symmetrical arrangement with a thoroughly municipal character, and to group the departments so as to give priority to the more important ones.

As many advantages are attained by planning the firemen's tenements to London-road in one continuous block similar to those in Fairfield-street, they have placed the gymnasium longitudinally parallel to Whitworth-street rather than to London-road (as shown on the sketch plan); and by a further minor re-adjustment of these tenements thirty-four complete sets are obtained in one scheme, of a larger and more uniform size as compared with the thirty-two sets shown in the sketch plan.

The buildings are to be warmed by heated air on the "plenum" system. The heating of the police-station is calculated so as to give a complete change of air in the cells every ten minutes.

The architects' estimate of cost is 74,930*l.*

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DESIGNS FOR JEWELLERY AND UTENSILS

ALL the work here illustrated is from designs by Mr. C. R. Ashbee, with the exception of the tankard, No. 8, which was designed by Mr. J. Witham and executed by Mr. A. Cameron.

No. 1 is a gold chain and pendant, with silver links set with pearls, designed and executed by Mr. Ashbee. The pendant is the figure of an angel cast in silver, with gold wings, under a canopy of blue enamel, and large pearl drops at the bottom.

No. 2 is a muff chain in oxidised silver with pearl facings; it was executed by Mr. J. McQueen.

No. 3 is a gold necklace, executed by Mr. C. Mason and Mr. A. Cameron. It is set with turquoise and enamels, as also the pendant.

No. 4 is an oxidised silver vase with enamelled lid mounted with a cluster of red cornelians; executed by Mr. C. Fawcett and Mr. A. Cameron.

No. 5 is a copper-gilt chalice set with carbuncles, executed by Mr. W. Hardman and Mr. A. Schonwerk.

No. 6 is an electric-light fitting in pewter and iron, made by Mr. W. A. White.

No. 7 is a copper-gilt jug, made by Mr. J. Bailey and Mr. A. Schonwerk, and No. 8 a copper-gilt biscuit-box.

All the work was done, we believe, at the Guild of Handicraft at Essex House, Mile End-road, under the direction of Mr. Ashbee.

THE NEW GOVERNMENT OFFICES.

THE following correspondence has taken place between the Institute of Architects and the Office of Works, in reference to the carrying out of the late Mr. Brydon's design for the new Government offices in Great George-street:—

"Royal Institute of British Architects,
9, Conduit-street, Hano[illegible]-square.
London, W.,
November 8, 1901.

To the Right Hon. A. Akers-Douglas, M.P., First Commissioner of Works and Public Buildings, Storey's-gate, S.W.

SIR,—The council of the Royal Institute of British Architects have taken the opportunity of their first meeting of the Session to pass a unanimous resolution that representations be respectfully addressed to his Majesty's Government with regard to the present proposal to execute the new Government buildings in Parliament-street from the late J. M. Brydon's designs without the aid of a specially-appointed architect of repute.

The council, with the warm support of the Presidents of all the architectural societies in the United Kingdom in alliance with the Royal Institute, whose names are appended as signatories to this letter, venture to express the earnest hope that even at this eleventh hour an architect in sympathy with Mr. Brydon's artistic ideals may be appointed to superintend the erection of this vast building, which, if not very carefully detailed in the spirit in which it was designed, will lose much of the grace with which Mr. Brydon, had he lived, would have clothed it. They would also, with all deference, point out that it is only during the execution of his building that the architect himself arrives at the true development of his original conception, so that, for the successful execution of work of this important character, the inventive genius of a sympathetic colleague of the original designer is essential.

The council of the Royal Institute of British Architects earnestly and respectfully urge the above considerations upon the attention of his Majesty's Government.

We have the honour to be, Sir, your most obedient servants,

WILLIAM EMERSON, President Royal Institute of British Architects.
THOMAS DREW, Kt., President Royal Hibernia Academy (Member of Council R.I.B.A.).
GEORGE C ASHLIN, President Royal Institute of the Architects of Ireland.
F. MARSHALL, President Sheffield Society of Architects and Surveyors.
S. PERKINS PICK, President Leicester and Leicestershire Society of Architects.
ALFRED DARBYSHIRE, President Manchester Society of Architects.
JOHN JAMES BURNET, President of the Glasgow Institute of Architects.
FRANK CAWS, President of the Northern Architectural Association.
FRANK W. WILLS, President Bristol Society of Architects.
ARTHUR MARSHALL, President Nottingham Architectural Society.
F. M. SIMPSON, President Liverpool Architectural Society.
W. H. BIDLAKE, President Birmingham Architectural Association.
BUTLER WILSON, President Leeds and Yorkshire Architectural Society.
H. G. LUFF, President Devon and Exeter Architectural Society.
JAMES P. BRUCE, President Dundee Institute of Architecture, Science, and Art.
C. H. CHANNON, President York Architectural Society.
EDWIN CORBETT, President Cardiff, South Wales, and Monmouthshire Architects' Society.
ARTHUR CLYNE, President Aberdeen Society of Architects."

"H.M. Office of Works,
Westminster, S.W.
November 28, 1901.

SIR,—I am directed by the First Commissioner of his Majesty's Works, &c., to acknowledge the receipt of your letter of the 8th inst., together with a resolution signed by the President of the Royal Institute of British Architects and others; and to say that Mr. Akers-Douglas quite appreciates the point of view of those who would prefer some other method of carrying out Mr. Brydon's work than that upon which he has decided.

It was, however, after careful examination, during which none of the considerations now urged were overlooked, that the decision to carry out the designs by the agency of Mr. Henry Tanner, F.R.I.B.A., the principal architect of this Department, was arrived at.

I may say frankly that among architects of high repute the First Commissioner failed, after some confidential inquiry, to discover any one sufficiently in sympathy with Mr. Brydon's artistic ideals to subordinate his own inventive genius to that of the original designer.

It appeared to Mr. Akers-Douglas due to the memory of Mr. Brydon that his work should remain intact, and that the designs which he left should be carried out with as little variation as possible. The question as to whether these drawings are in a sufficiently complete state to enable this to be done is one upon which the First Commissioner is aware opinions differ; but he has confidence in the judgment of his technical advisers, and he will be ready to exhibit these drawings to Parliament should his action, as a Minister of the crown, be hereafter questioned.—I am, Sir, your obedient servant,
ESHER.

The Secretary, Royal Institute of British Architects, 9, Conduit-street, W."

INSTITUTE OF SANITARY ENGINEERS:

ANNUAL DINNER.

THE annual dinner of the Institute of Sanitary Engineers was held at the Holborn Restaurant on Wednesday evening. Dr. J. B. Wilkinson, Medical Officer of Health for the County-Borough of Oldham, presided, and amongst those present were Dr. J. C. Thresh (president-elect), Mr. W. J. Wells, Mr. H. M. Dove, C.E., Messrs. N. W. Hoskins, C. E. Butcher, T. W. Deadman, F. W. Mason, and Arthur E. Ashby (secretary).

After the loyal toast had been honoured, Mr. A. Baker proposed "The Navy and Army."

Lieut.-Col. W. R. Smith, V.D., acknowledged the toast, and said that circumstances which had recently occurred made him very interested in the prosperity of the Institute. He was, as they knew, connected with the Royal Institute of Public Health, which was housed under the same roof as the Sanitary Engineers. He knew they had had some anxiety lately, but he hoped, after the consolidation which had taken place between them, that they would go forward and achieve a very great measure of success, and that in every possible way they would do for themselves and the country what was so much needed. So far as his Institute was concerned, it would always be delighted to help and co-operate with the Sanitary Engineers.

Mr. G. P. Reveirs, Chairman of the Sanitary Publishing Company, submitted the toast of the evening, "The Institute of Sanitary Engineers." In spite of what was said about America and Germany being ahead of us, there was one science in which we excelled—that was the science of sanitation. No doubt we had become a little spoilt by prosperity, but he considered that if we dealt with the question in a practical way we should get abreast of our international rivals as time sped on. In the past, he regretted to say, the voices of labourers in the work of sanitary science had been like those of the prophets—in the wilderness. To-day, however, a large proportion of the inhabitants of this country were friendly to them, a certain proportion were interested in their work, and a minority were hostile. But even the latter were gradually coming to their side. Their greatest difficulty was ignorance; the next, vested interest. In fact, sanitary engineers were engaged in the greatest crusade of our time. Sanitation was the handmaid of religion—a fact that was only just beginning to be realised. Another science that had always gone with theirs was that of medicine. Referring to the problems that confronted them, he spoke of the housing of the working classes, and urged that membership of that Institute should be a guarantee that the advice or the work put in by members would be of the very best. He trusted this would be borne in mind, and that increased attention would be given to the Institute. Unfortunately, through the death of their late secretary (Mr. Kemsley) they had not been able to hold some meetings as in previous years, but he hoped that in the years to come their meetings would be better attended, that they would have more of them, and that the papers would be more distinct and of growing value.

The Chairman, in responding, said the Institute was born in the closing decade of the last century, and he trusted it would be fed on food upon which it would thrive. He agreed that the housing of the working classes was one of the great problems that confronted them. True, we were very much better now in the matter of housing than in those years long past, when, according to an eminent public health servant, people were considered well off so long as there was only one family in each corner, but when a new family came to the middle of the room there was some difficulty. Such things as that were, happily, now of the past. Sewage disposal was another problem facing them, and he regarded the Institute as of the highest value in giving them facilities to bring forward their difficulties and failures for criticism.

Dr. Thresh proposed "The Chairman and Members of Council," and Messrs. W. J. Wells (Chairman), F. J. Rayner, and E. R. Palmer responded.

"The Visitors" was given by Mr. H. M. Dove, and acknowledged by Mr. A. Baker, solicitor to the Institute.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was decided to lend Poplar Borough Council 3,680*l.* for sewer and channelling works and 3,100*l.* for street lighting purposes; Fulham Borough Council 3,550*l.* for underground conveniences; and Guardians of Wandsworth and Clapham Union 13,460*l.* for erection of schools.

Telephones.—The Post Office Telephone scheme was discussed at considerable length, on a recommendation of the Highways Committee that regret should be expressed that it did not secure to the public the advantages they had been led to expect. The recommendation was agreed to, with an addition that the Postmaster General be asked to receive a deputation on the subject.

A Limehouse Housing Scheme.—The Housing of the Working Classes Committee submitted sketch plans of a housing scheme which the Stepney Borough Council had undertaken to carry out at Queen Catherine-court, Lime house. The County Council had undertaken to contribute half the net cost, not exceeding 3,200*l.*, and the plans were for a block of five-story balcony dwellings, to accommodate 130 persons in eleven tenements of two rooms, and fourteen tenements of three rooms.

The Council approved the plans.

Gas Testing.—A report of the Public Control Committee drew attention to the refusal of the South Metropolitan Gas Co. to comply with the notification of the Gas Referees relating to the cleaning out of the service pipes at certain testing places, the result being that no tests could be made. It was recommended:—"That the Board of Trade be urged to deal at once with the matter of the refusal of the South Metropolitan Gas Co. to comply with the notification of the Metropolitan Gas Referees with regard to the cleaning out of the service pipes at gas testing-places."

The recommendation was agreed to.

Isolation Hospital, Colney Hatch Asylum.—It is proposed to erect an isolation hospital at this asylum. It is intended to provide accommodation for three male and three female patients

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and the necessary staff. The dormitory has been arranged for two beds, each having a space of 2,000 cubic feet, the single rooms having a similar capacity. The building is being connected with the late chaplain's house by a corridor open at the sides and roofed over, the day rooms, nurses' room, lavatory, kitchen and scullery accommodation being provided by utilising the latter building. The cost of this hospital is estimated to be the same as the amount originally voted, viz., 2,000*l.* The new plans have now been approved by the Home Secretary, and the Asylums Committee recommended that the Council do sanction the alteration of the plans of the isolation hospital at Colney Hatch Asylum to enable accommodation to be provided for three male and three female patients with the necessary staff, instead of four female patients as originally contemplated.

The recommendation was agreed to.

Theatres, &c.—Approval was given, on certain conditions, to the carrying out of the following works :—

Alterations to the back portion of the St. John's Schools, Peel-grove, Bethnal Green (Mr. A. Cox for Mr. D. Keymer).

Alterations, Balham Music Hall (Mr. Cronk).

Arrangements of seating in men's first-class swimming-bath at the Battersea Public Baths, Nine Elms, when such bath is converted into a concert-hall (Mr. W. M. Wilkins, for Battersea Borough Council).

Arrangements for the electric lighting of the Battersea Public Baths, Nine Elms (Mr. H. R. Forbes Mackay for the Battersea Borough Council).

Fire-resisting screen to the proscenium opening at the Britannia Theatre, Hoxton, and the ventilation of the stage, &c. (Mr. B. Crewe for Messrs. W. S. & A. L. Crauford).

A re-arrangement of the artistes' entrance and the provision of new external doors to the scenery entrance to the stage, and of a new pair of swing doors to the stalls entrance at the Empress Theatre of Varieties, Brixton (Messrs. Wylson & Long).

A small pass door at the Hackney Empire, between the upper circle saloon and the gallery staircase (Mr. F. Matcham for Mr. Oswald Stoll).

Alterations to the lavatory accommodation at the Murphy Memorial Hall, Gurney-street, New Kent-road (Mr. A. S. Taylor).

An alteration in the position of an iron door between the o.p. side of the stage and the stairs leading to the basement of the Oxford Music-hall (Messrs. Wylson & Long).

District Surveyors' Districts—District of Paddington.—The Building Act Committee reported as follows, the recommendation being agreed to :—

"Our report on the district surveyors' districts under the London Building Act, 1894, submitted to the Council on November 19, 1901,* contained a recommendation with respect to the district of Paddington which we instructed our chairman to withdraw, as we considered it desirable to have some additional information on the subject. Upon further consideration, we have decided to make no alteration in the terms of the recommendation. We recommend—That Mr. F. R. Meeson, District Surveyor for East Hackney, North, be transferred and appointed to the vacant district of Paddington upon the conditions now in force regulating the appointments of new district surveyors; that the western limit of the district of Paddington, from Kensal-road to Kensington-gardens, be adjusted so as to coincide with the boundary of the Borough of Paddington at that part; that such transfer and appointment do take effect from January 1, 1902; and that advertisements be issued inviting applications for the appointment of District Surveyor for East Hackney, North."

Tribunal of Appeal—Corbett v. London County Council.—The same Committee reported as follows, the recommendation being agreed to :—

"The Council on July 16, 1901, refused to sanction the formation of a new street out of the west side of Torridon-road on the St. German's Estate, Hither Green, Lewisham. Mr. A. Cameron Corbett, M.P., on whose behalf the application had been submitted, appealed to the Tribunal of Appeal, and the appeal was allowed, subject to the reservation of a strip of land running from the south-west corner of the new road for a future extension to a proposed road on the estate. A form of agreement, to be entered into between the Council and Mr. Corbett in accordance with the order of the Tribunal is being prepared, and we ask authority to have the seal of the Council affixed to the agreement in the event of such sealing being necessary. We recommend—That the seal of the Council be affixed to the agreement to be entered into between the Council and Mr. A. Cameron Corbett, M.P., in accordance with the order of the Tribunal of Appeal in the case of the formation of a new road out of the west side of Torridon-road on the St. German's Estate, Hither Green, Lewisham, in the event of such sealing necessary."

St. Dunstan's, Stepney.—The Historical Records and Buildings Committee reported as follows :—

"The Council is probably aware that on October 12, 1901, St. Dunstan's Church, Stepney, one of the most historic buildings in the East End, was partially destroyed by fire. The church, which has, however, been much altered, dates from the year 1486, and it is said (though the statement admits of some doubt) that the site was occupied by a church from early Saxon times. The Clerk of the Council has, by our instructions, prepared a report as to the extent of the damage, and we think the following particulars will be of interest to the Council. The principal damage done to the main body of the church consists in the destruction of the old vestry, the roof of the chancel, and the greater portion of the roof of the centre of the nave. The side aisles are very little injured, the south aisle being almost untouched. The interesting old monuments and wall-plates, including the monument to Sir Henry Colet, Lord Mayor in 1495, and father of Dean Colet, the founder of St. Paul's School, and the well-known 'Fish and Ring' monument to Dame Rebecca Berry, have almost entirely escaped the effects of the fire, and the seats and the stone arches are undamaged. Even more important is the fact that the parish registers, which, with the fine seventeenth-century communion plate, were in an iron cupboard in the destroyed vestry, were saved. These parish registers date back to 1568, and are amongst the most interesting parochial records in London. Unfortunately, the organ, the front of which was one of the finest examples of Grinling Gibbons' carvings, was totally destroyed. A fine stained glass window and a modern vestry were also destroyed, but neither of these were of any particular historical interest. We understand that in restoring the church every effort will be made to preserve as much as possible of the old building, and to restore the destroyed portions in their original form; and we have asked to be informed of the plans of restoration when a definite decision has been arrived at with reference thereto."

Housing.—The Housing of the Working Classes Committee reported as follows :—

"Mulready-buildings and the second block of the dwellings known as Reynolds-buildings, Millbank Estate, are now ready for occupation. It will be remembered that the completion of Reynolds-buildings has been delayed by the making good of the damage done by fire to the upper portion of the buildings. Accommodation is provided in this block of Reynolds-buildings for 190 persons in 19 tenements of two rooms and 19 tenements of 3 rooms, and, in addition, an estate office and a 4-room tenement are provided for the use of the superintendent of the estate. Mulready-buildings provide accommodation for 230 persons in 20 tenements of 2 rooms and 25 tenements of 3 rooms."

The Council, having transacted other business, adjourned.

THE TRIBUNAL OF APPEAL.

THE Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institution, Great George-street, S.W., on the 29th ult., to hear an appeal by Mr. A. G. H. Brown, under Section 13 of the Act, against the determination of the London County Council, dated October 24, refusing their consent to a deviation from the plans approved by the Council on April 30 for the erection of a block of residential flats on the site of 400 and 402, Coldharbour-lane, Brixton, so far as it related to an increase in the height of the proposed building as shown on the plans dated September 7 and 12, 1901, submitted with the application of Mr. F. A. Cowell.

The members of the Tribunal present were Messrs. J. W. Penfold (Chairman), A. H Hudson, and E. Gruning.

Mr. McIntyre, barrister, represented the appellant, and Mr. Andrews, from the Solicitors' Department of the London County Council, appeared for the respondents.

Before the facts of the case were entered into, Mr. Andrews offered the preliminary objection that the appellant had not given the section and sub-section of the Act under which the appeal was brought. This, he contended, was necessary under the rules governing the procedure of the Tribunal, rules which had been approved by the Lord Chancellor.

After some argument, the Chairman said the Tribunal upheld the objection that the notice of appeal was, in consequence of the omission, bad. Inasmuch as they had no authority to allow a departure from the rules, their jurisdiction was ousted. They allowed the respondents ten guineas costs.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Westminster.—A hood over the entrance to No. 34, Queen Anne's-gate, Westminster (Mr. A. M. Poynter for Mr. C. S. Goldmann).—Consent.

Greenwich.—That the application of Mr. J. Wills for an extension of the period within which the rebuilding of the Baptist Church, Shooter's Hill-road, Blackheath, was required to be commenced, be granted.—Agreed.

Hackney, North.—That the application of Mr. G. H. Paine on behalf of Mr. C. C. Paine, for an extension of the period within which the erection of eight houses, with bay windows, on the east side of Upper Clapton-road, Hackney, between No. 174 and Moresby-road, was required to be commenced, be granted.—Agreed.

Hammersmith.—The retention of a three-story addition at the rear of No. 138, Goldhawke-road, Shepherd's Bush, abutting upon St. Stephen's-avenue (Mr. A W. Osborn).—Consent.

Hampstead.—Wood and tile pent roofs over the entrances to five houses in course of erection on the north-east side of Fordwych-road, Hampstead (Mr. J. Phœnix for Messrs Bridge & Neal).—Consent.

Lewisham.—The retention of a dwelling-house on the northern side of Farley-road, Catford, eastward of Laleham-road (Mr. C. Farley).—Consent.

Lewisham.—Wood and slate pent roofs over the entrances to two houses on the north side of Tredown-road and two houses between Nos. 28 and 34, Burghill-road, Sydenham (Mr. G. Tolley for Mr. W. Cooper).—Consent.

Lewisham.—Wood and slate pent roofs over the entrance doorways of four houses on the south-east side of Brockley-road, Lewisham, northward of Stillness-road (Messrs. Thomas & Son).—Consent.

Marylebone, East.—A stone balcony over the arched hood of the entrance doorway to No. 101, Harley-street, St. Marylebone (Mr. W. H. White for Mr. A. F. Voelcker).—Consent.

St. George, Hanover-square.—A warehouse building on the site of Nos. 199 to 203, Buckingham Palace-road, Pimlico (Mr. W. A. Large for Messrs. Humphreys, Limited).—Consent.

St. Pancras, South.—The retention of a wooden facia and cornice fixed round the base of a projecting oriel window on the north-western angle of No. 28, Rathbone-place, Oxford-street (Mr. P. Dollar for Mr. J. Brehm.)—Consent.

Strand.—A stone canopy and balcony over the entrance to the Town Hall, Charing Cross-road (Mr. J Murray for the Council of the City of Westminster.)—Consent.

Wandsworth.—Two three-story houses, with shops on the ground floor, on the site of No. 279, Balham High-road (Mr. H. E. Rossiter for Mr. H. W. Nightingale).—Consent.

Battersea.—A parcels office, milk depôt, and covered cab yard at Clapham Junction Railway Station on the northern side of St. John's Hill, Battersea (Mr. S. Bircham for the London and South-Western Railway Co.).—Refused.

Clapham.—The retention of a brick wall and the erection of an addition at the rear of No. 89, New-road, Wandsworth-road, Battersea, abutting upon Mundella-road (Mr. H. Griffin for Mr. J. H. Burr).—Refused.

Hackney, North.—A block of residential flats with on -story shops in front, on the north-east side of Manor-road, Stoke Newington (Messrs. Gordon & Gunton for Mr F. Matthews).—Refused.

Kensington, South.—A one-story addition at the rear of No. 67, Marloes-road, Kensington, to abut upon Scarsdale-villas (Messrs. J. Surrey & Son for Mrs. M. Surrey).—Refused.

Norwood.†—A porch at the entrance to a bank building on the south-east side of Ulleswater-street, Norwood-road, Norwood (Messrs. W. G. Bartleet & Son for the London and County Banking Co., Ltd.).—Refused.

Width of Way.

Chelsea.—A brick boundary wall in front of stable buildings on the site of Nos. 57 and 59, Church-street, Chelsea (Mr. R. T. Kingham for the London General Omnibus Co., Ltd.).—Consent.

Hampstead.—Three four-story bay windows to a block of residential flats on the site of Nos. 6 and 7, The Mount, Hampstead (Mr. C. W. Matthews).—Consent.

St. Pancras, East.—A three-story dwelling-house at the rear of Nos. 18 and 20, Jeffreys-street, Kentish Town-road (Mr. T. B. Westacott).—Consent.

Greenwich.†—A one-story addition at the Thames Engineering Works, Greenwich, with the external

* See our issue for November 23.—ED.

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walls of such addition at less than the prescribed distance from the centre of John Penn-street (Mr. G. S. Young for the Thames Ironworks, Shipbuilding, and Engineering Co., Ltd.).—Refused.

Westminster.—A mansard roof, to form an additional story to Nos. 32 and 34, Great Peter-street, Westminster, at the corner of St. Ann's-lane (Messrs. Wake & Co. for Messrs. Wilson & Pilcher, Ltd.).—Refused.

Space at Rear.

Holborn.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings and extension above the diagonal line, so far as relates to the proposed erection of an hotel building on a site on the north side of Great Russell-street, at the corner of Bloomsbury-street, with an irregular open space at the rear (Mr. G. Waymouth for Messrs. Howard & Co.).—Consent.

Lines of Frontage and Width of Way.

Hackney, Central.—A one-story addition to a building in the garden of No. 97, Lansdowne-road, Hackney (Mr. A. Cook).—Refused.

Strand.—A building on the site of Nos. 19 and 20, Bateman-street, Soho (Mr. H. A. Woodington for Mr. B. Lynch).—Refused.

Width of Way and Space at Rear.

Hammersmith.—Deviation from the plans approved for the erection of two blocks of flats on the site of Nos. 54, 54A, 56, 58, and 60, Queen-street, Hammersmith, so far as relates to an alteration to the front enclosure of the third floor of such flats (Mr. J. Butters for Mr. C. W. Carpenter).—Consent.

Projection and Construction.

Holborn. — A gangway across Onslow-street, Holborn, to connect No. 87, Farringdon-road with a building on the west side of Onslow-street (Messrs. Lander, Bedells, & Crompton for Messrs. Falk, Stadelmann, & Co.).—Consent.

Formation of Streets.

Hackney, North.—That an order be issued to Messrs. Lamb, Son, & Prance, sanctioning the formation or laying out of a new street for carriage traffic to lead from Mount Pleasant-lane to Comberton-road, Hackney, and in connexion therewith the widening of Mount Pleasant-lane and Comberton-road (Mr. W. W. Hayworth). That the name Alcester-crescent be approved for the new street.—Agreed.

Hampstead.—That an order be issued to Messrs. Tuckett & Son sanctioning the formation or laying out of new streets for carriage traffic on the Powell-Cotton estate, on the north side of Westbere-road and north-west side of Minster-road, Hampstead (Mr. P. H G. Powell-Cotton).—Agreed.

Strand.—That an order be issued to Mr. A. Young sanctioning the formation or laying out of a new street for carriage traffic to lead from Kemble-street to Drury-lane, Strand (for the Improvements Committee of the Council).—Agreed.

Means of Escape from Top of High Buildings.

Strand.—Means of escape in case of fire proposed to be provided, in pursuance of Section 63 of the Act, on the sixth floor of a building erected on the site of No. 19, Charing Cross-road and No. 28, Leicester-square, and known as Gloucester House (Mr. J. P. Crosby).—Consent.

Kensington, South.—Means of escape in case of fire proposed to be provided, in pursuance of Section 63 of the Act, on the eighth and ninth stories of a block of residential flats known as Block No. 1, Iverna-court, and situate on the west side of Wright's-lane and south side of Iverna-gardens, Kensington (Mr. R. Clarke for Messrs. J. Howard & Co.).—Refused.

Cubical Extent.

Hackney, North.—A factory building, on the west side of Tyssen-street, Dalston-lane, Hackney, with one division, to exceed in extent 250,000 but not 450,000 cubic feet, and to be used only for the purposes of a cabinet and joinery works (Mr. E. O. Sachs for the Shannon, Ltd.).—Refused.

The recommendations marked † are contrary to the views of the Local Authorities.

BOOKS RECEIVED.

BOOK OF TABLES OF CUBIC CONTENTS OF DEALS, BATTENS, &C. By Thomas Valder. (Longmans, Green, & Co.)

FREEHAND DRAWING OF FOLIAGE, &C. By John Carroll. (Burns & Oates.)

ALL SAINTS' MISSION, PENTONVILLE.—Lady Jeune, on the 30th ult., laid the foundation-stone of the new Mission Church of All Saints, Pentonville, N. The dimensions of the church are 38 ft. by 45 ft., and seating accommodation will be provided for 250 persons. Below the church is a gymnasium, with the same floor space and 15 ft. high. The building has been designed by Mr. R. A. Briggs, and is being constructed by Messrs. Campbell, Smith, & Sons in red brick with Bath stone dressings. Its cost will be 4,500*l.*

Correspondence.

To the Editor of THE BUILDER.

THE DIRECT EMPLOYMENT OF LABOUR.

SIR,—In his concluding paragraph your correspondent of last week, "One from the Bench," seizes an idea that has been a good deal discussed of late, and of which much more may be heard. His views on the execution of works without the intervention of a contractor are very natural from the workman's point of view and deserve attention.

By the force of circumstances the contractor is fast becoming less of a manufacturer of the different items of a building, and more of a purchaser and constructor. In like manner, the workman in the building trades becomes less of an artificer and more exclusively a fixer. In the five and twenty pages that, like husk and shell, enclose the kernel of your journal, in volumes of advertisements inches thick, by pestering travellers and pursuing catalogues, one is shown how to acquire ready-made the different items of a building so as to dispense more and more easily with the regular mechanic. There are good old trades the necessity for which has practically gone, not only as regards the operation of building, but even in the workshop, and the process does not stop. The contractor may, if he likes, have his yard and workshops, his dead stock and live stock, his machinery and the clerical staff of a large manufacturing establishment; and, as a rule, he probably will keep up this system more or less. But it is no more necessary than it is for a joiner to have the old-fashioned box of tools. And if this is unnecessary for the contractor, it is unnecessary for the private building-owner.

Thus the temptation to dispense with the contractor and to carry out the work by direct labour under a foreman or clerk of works, directed by the architect or engineer, increases, and the sources of economy seem many. There is the saving of the contractor's profit, of his heavy payments for interest, and of the sums which he must put down on account of the stringency of the conditions of contract. The owner with money in hand can buy as well as—indeed, I have been told, better—than the contractor who takes even the shortest credit; he can insure against every insurable risk, and he may not unreasonably hope to come out of the business better than he would do if it had been done by contract.

But people do not, as a rule, enter into contracts to save money, but to avoid risk, and the risks against which it is impossible to insure are many and heavy. If drawings, specification, quantities, and contract are all right, as they should be, the owner knows at the outset what the building will cost him; but when he is his own builder he can be sure of nothing until he has got in the last bill, nor even then, for he will still have to make good all defects. A rich man or company or corporation may be advised to take the risks of such business, but the ordinary man, who has probably scraped together with difficulty the money first supposed to be sufficient for his building, and may count on borrowing enough to make up for the increase in the estimate which usually declares itself, cannot prudently be advised to go into building on his own account, even though he may go to specialists for nearly everything that he requires. There is still a great and uncertain item for labour, the risk of strikes, the risk of miscalculations, and of dishonesty even, though your correspondent seems to think that honesty and reliability can be ensured with a stroke of the pen.

Upon the whole, I think the contractor, whether big or little, will be with us for some time longer, and it would be well for all parties concerned with building to make the best of the system by fair dealing and reasonable demands.

THOS. BLASHILL.

BRICKLAYERS NOW AND THEN.

SIR,—At regular intervals, and in the entire absence of the all-absorbing sea-serpent story, the journalist of the day must dish up something that has a promise to "catch on for a while" at any rate. And, apparently, a shot at the British mechanic through the bricklayer, in this instance, gives the essentials of such a promise. It has served the purpose before, and very likely will again. These fables die hard. The sting of these fables lies in the covert sneer, that is scarcely hidden below the surface, and which, in a few words, implies that a bricklayer now dare not lay as many bricks as he could if allowed, and that because his mates will not allow him.

With your permission, Sir, I shall try to give an impartial answer. I have been in the building trade thirty-seven years, as an apprentice, carpenter, shop foreman of joiners, general foreman, and clerk of works, and here is my answer in brief. Bricklayers do not lay so many bricks now as formerly, and that mainly because they do *lay* them now. On any decent job to-day the sectional bond as well as the face work has to be properly carried out, all the joints have to be properly flushed up; in short, a good proportion of conscience is introduced into the wall along with the bricks and mortar. I have no hesitation in saying that all this was extremely rare so late as fifteen and twenty years ago. Then very seldom was sectional bond thought of, and the work was not as a rule flushed up or grouted. Now this is the rule. Again, Sir, just look at the class of work that is demanded of bricklayers now, compared with what was demanded then. Architects now are not satisfied with the plain expressionless monotone surfaces, unrelieved by any projecting feature, horizontal or perpendicular, that did duty then. If an occasional look-out was kept for a rectangular hole for a door and another for a window—after that it was plain sailing for muscle, because brain had done its duty. Under those conditions a bricklayer could, and did, lay twice—yes, often three times—as many as he can lay now. And why? One instance may suffice. I am at present in charge of a job where no less than eight different kinds of bricks are used, with Bath stone dressings at frequent intervals. The surface of the walls is often broken by projecting bands and by recesses and piers, thus involving a great deal of plumb rule work. Under the above circumstances any tyro can see that a bricklayer now cannot lay as many bricks as he could then. Then, perhaps, he worked hard; on the above class of work now he can only be busy. He has to use his brains more now, and his great want is—more brains still.

In answer to your P.S. to the letter of an old bench hand, I for one have never known of a case in which an organised attempt was made to restrict the output of work by a set of bricklayers against any individual or set of individual bricklayers. So far as my observations go, I have never suspected an attempt at coercion in the above direction. Bricklayers are human. There are worthless fellows among them, but the latter do not rule the mass; they only sneak their way about until they are found out.

MONDAMIN.

"THE CA' CANNY (GO-EASY) QUESTION."

SIR,—I have read nearly all the letters and articles that have appeared in the daily Press and in the *Builder* about the alleged slowness or laziness of bricklayers, and it surprises me to find that certain persons are beginning to discover a few facts that other men have known all their lives.

My experience has been acquired during nearly thirty years' occupation as foreman and as clerk of the works in eighteen different counties of England and Wales, and the result of notes made and observations recorded is that brickwork costs for labour almost precisely the same number of hours in all localities. During the past six or seven years I have had charge of some rather large jobs that have swallowed up from three to four millions of bricks per annum, taking one year with another, and these jobs were located so as to form roughly an equilateral triangle with sides about ninety miles long. The builders and the architects were in each case different, and the men and the foremen were in each case also different. The work, however, was somewhat similar. The walls were thick, and straight and long; the bulk were 14 in., faced outside with red bricks, and there were a rather large number of glazed bricks used internally as facings. The proportions were, roughly stated, as follows:—57½ per cent. stocks, 30 per cent. red facings, 12½ per cent. glazed facings, and none of the work was pointed as it was built, but all joints were well raked out and swept off clean.

The outcome of my observations and notes was that, taking each of the before-mentioned jobs and dividing the number of bricks of all kinds used per the merchants' invoices by the number of trowels, gave an average of 400 bricks per day per bricklayer. There was not 5 per cent. difference between either of the jobs in the quantity of bricks laid per day.

In my opinion, based on many years' close observation and many confidential chats with bricklayers of all sorts, the right way to estimate the cost of the labour to a rod of reduced brickwork is to allow eleven full days' work (two working weeks) for one bricklayer at local rate of wages as the net prime cost of brickwork in public buildings such as hospitals and asylums. That rate of price would include internal and external work, facings of ordinary and glazed bricks, but not the pointing. Of course, if the estimator puts down a fancy price for laying facing bricks, then my calculation of eleven full days for a bricklayer must be reduced.

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As regards the evil influence of the trade-unions, I must candidly say I think that is all "moonshine" I have talked to lots of bricklayers, both society and non-society, and I have never heard a word to lead me to suppose anything of the kind exists.

In conclusion, I would like to say that to bring out an average of 400 bricks laid per day right through a big job, the heavy footings must be laid with great rapidity and each man must then account for over a thousand per day. In bricklaying, as in many other things, circumstances alter cases.

PROVINCIAL.

The Student's Column.

GAS AND GAS-FITTINGS.

22.—THE PROPERTIES AND GENERATION OF ACETYLENE.

THE PROPERTIES OF ACETYLENE.—Pure acetylene is a colourless gas possessing a sweet ethereal odour. Commercial acetylene possesses a stronger and more offensive odour owing to the presence of gaseous impurities. The chemical formula for acetylene is $C_2 H_2$, which indicates that it consists of 92·3 per cent. by weight of carbon combined with 7·7 per cent. of hydrogen. It is soluble in water to a considerable extent, eleven volumes of gas being dissolved by ten volumes of water at ordinary atmospheric temperature and pressure. The gas is much less soluble in water which has been saturated with common salt, but strongly saline solutions are found to exert a corroding influence on the metal vessels commonly used for the generation or storage of acetylene. Acetylene is much heavier than coal gas, but somewhat lighter than air. The approximate specific gravities of acetylene and other gases extensively used for lighting or heating purposes are shown in the following table :—

Hydrogen	0·07
Coal gas	0·42
Plain water gas	0·54
Natural gas, U.S.A.	0·56
Carburetted water gas (26 c.p.)	0·62
Mond gas (Power gas)	0·79
Acetylene	0·91
Air	1·00

Acetylene gas can be converted into a colourless, transparent liquid under normal atmospheric pressure by cooling it to −82 deg. C., or into a solid white crystalline mass by cooling it to −85 deg. C. The gas may be liquefied at a higher temperature if also subjected to high pressure. Acetylene is feebly poisonous, but it is less poisonous than ordinary coal gas.

Acetylene an Endothermic Compound.—Some compounds absorb heat during their formation, and evolve that heat when they subsequently undergo decomposition. Such compounds are termed endothermic, and acetylene belongs to this class. Other compounds evolve heat when they are formed and absorb heat when they are decomposed, and are termed exothermic. The endothermic character of acetylene is a factor which must be taken into consideration when considering its explosive value for engine driving, or its flame temperature, since to the heat of combustion of its component hydrogen and carbon is added the heat absorbed during its formation.

Detonation of Acetylene.—Acetylene without admixture with air can be decomposed with explosive violence by firing in it a detonator such as mercuric fulminate, but unless the acetylene is under higher pressure than ordinary atmospheric pressure the explosion is extremely local, and is comparatively harmless, as the greater portion of the acetylene remains unaffected by the detonation. The products of the decomposition by detonation are amorphous carbon and gaseous hydrogen. This amorphous carbon or "acetylene black" is now manufactured on a large scale by compressing the acetylene under a pressure of two atmospheres and exploding it by means of an electric wire or spark, air being carefully excluded. The carbon thus produced is said to form a remarkably high-grade pigment.

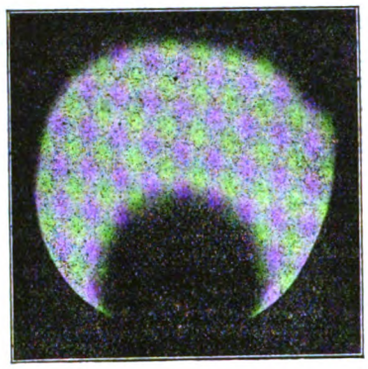
Explosibility of Acetylene Mixed with Air.—Any mixture of acetylene and air containing from 3 to 82 per cent. of acetylene will explode when ignited. The most violent explosion is produced when the proportion of acetylene amounts to from 8 to 10 per cent. by volume of the mixture. In the presence of air acetylene can be ignited at a temperature of 896 deg. Fahr., which is considerably lower than the igniting point of coal-gas.

Illuminating Power of Acetylene.—Under the most favourable conditions acetylene will give a flame of 48 c.-p. when burning at the rate of 1 cubic foot per hour, but this result is seldom or never attained in practice. A good commercial burner consuming commercial acetylene at a rate of 1 cubic foot per hour will give a light of about 32 c.-p. The relative illuminating values of acetylene and coal-gas per cubic foot of gas consumed per hour under good working conditions may be stated as follows :—

	Per cubic foot of gas per hour.
Acetylene	32 candles.
Coal-gas, flat flames	2½ „
„ incandescent mantle	20 „

Acetylene is so rich in carbon that no burner has yet been devised which will consume it at a rate of 5 cubic feet per hour without producing either a smoking flame or a flame of comparatively feeble luminosity. In practice it is found necessary to employ burners incapable of passing more than 1 cubic foot of gas under ordinary pressures, and a large number of burners which consume only ½ or ¾ of a cubic foot per hour are in use.

The relative sizes of a coal-gas flame and an acetylene flame of equal illuminating power are shown in fig. 55.



(a)

(b)

Fig. 55.—a = 16-Candle Coal-Gas Flame, consuming 6½ c. ft. of gas per hour. b = 16-Candle Acetylene Flame, consuming ½ c. ft. of gas per hour.

The photograph shows a 16-candle coal-gas flame (a) obtained from a No. 6 flat-flame burner when consuming 6½ cubic ft. of gas per hour under a pressure of 1 in., while the acetylene flame (b), which is photographed on exactly the same scale, was obtained from a Naphey burner passing ½ cubic ft. of acetylene per hour under a pressure of 3 in. The best results with these burners were obtained with coal-gas under a pressure of 1 in., and with acetylene under a pressure of 3 in., the difference in pressure being necessitated by the difference in the specific gravities and carbon contents of the two varieties of gas.

Heating Power of Acetylene.—The heating value of acetylene is much greater than that of any other gas commonly used for domestic or industrial purposes. The following table shows the relative heating values per cubic foot of each of the principal commercial varieties of gas :—

	Calories.
Acetylene	379
Natural Gas, U.S.A.	225
Coal-gas	156
Hydrogen	82
Water-gas (plain)	76
Mond gas (power gas)	39

Acetylene is therefore far superior, volume for volume, to coal-gas for engine driving or heating purposes, but its cost is in most cases prohibitive.

When used for illumination, however, acetylene does not evolve more heat than coal-gas consumed in flat flame burners because a much smaller volume of gas is required to produce a light of given intensity. From the following table given by Lewes it will be seen that the heat emitted by the acetylene flame closely approximates to that emitted by an incandescent coal-gas light of the same intensity, but is much less than that emitted by luminous coal-gas flames.

Ratio of Heat Emitted to Yield a Light of 64 candles.

Incandescent coal-gas light	100
Acetylene	115
London Argands	571
Flat flame burners	914

Combustion Products.—When pure acetylene is consumed in suitable burners the only products of combustion are carbon dioxide and water vapour, the same compounds as those which form the main proportion of the combustion products of coal-gas. Professor Lewes has calculated the extent to which the atmosphere of a room is prejudicially affected by acetylene, coal-gas, and oil lamps respectively, and has drawn up the results in the following table :—

Comparative Hygienic Effect of Illuminants per Unit of Light.

—	Carbonic Acid Evolved.	Moisture Evolved.	Oxygen Removed from Air.	Heat Produced.
Acetylene	100	100	100	100
Coal-gas, flat flame	480	1,470	520	795
Coal-gas, mantle	45	230	62	87
Petroleum, large lamp	996	700	498	246

Actinic Value of Acetylene Flames.—The light emitted by acetylene flames more nearly approaches that of sunlight in the relative proportions of rays of different wave length than any other light produced by artificial means, and is even richer than sunlight in those blue and violet rays of the spectrum which are most active in effecting chemical change in those bodies which are sensitive to light. Acetylene is therefore exceedingly useful for photographic work, and Walmsley finds its relative value as compared with other forms of light for acting upon sensitive photographic plates to be as follows :—

	Seconds.
Direct sunlight	1
Acetylene, 1 c. ft. burner	3
Diffused daylight, reflected from mirror	12
Incandescent mantle	24
Coal gas / Oil gas / Oil lamp	240

The Generation of Acetylene.—Several methods of producing acetylene are known, but the only process of commercial importance is that which consists in effecting contact between calcium carbide and water. The following chemical equation represents the reaction which takes place :—

$$\underset{\text{Calcium carbide}}{CaC_2} + \underset{\text{water}}{2H_2O} = \underset{\text{yield acetylene}}{C_2H_2} + \underset{\text{slaked lime.}}{Ca(OH)_2}$$

and signifies that sixty-four parts by weight of calcium carbide will react with thirty-six parts of water to form twenty-six parts of acetylene and seventy-four parts of slaked lime. Theoretically, therefore, 1 lb. of carbide requires rather less than half a pint of water for complete decomposition, but in practice at least one pint of water should be allowed for every lb. of carbide, as a considerable quantity of water is vapourised as steam and carried forward with the gas.

Cool Generation Necessary.—The chemical reaction which occurs when calcium carbide comes in contact with water is accompanied by the evolution of heat, and it is a matter of great importance that the heat should not be allowed to accumulate in the decomposing carbide, but should be conducted from its neighbourhood as speedily as possible. When a small fragment of carbide is dropped into a vessel filled with water, the carbide rapidly decomposes, but the heat evolved is so quickly distributed through the large bulk of water that the temperature of the water is not perceptibly increased. If, however, water is allowed to fall in a fine continuous spray over a

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large mass of carbide, the decomposing carbide becomes strongly heated, polymerisation of the acetylene occurs, and benzene and tarry compounds are produced.

The slaked lime which is obtained as a residue when all the carbide has been decomposed should be white or grey. If it is of a yellow colour, or contains soot or tarry matter, it is evident that the carbide has been decomposed under unfavourable conditions.

In some generators carbide can always be decomposed without materially increasing the temperature of the decomposing mass, while in others both the carbide and the generator become strongly heated. Sometimes a water-jacket is placed around the generator to keep the generator cool, but this may in many cases be regarded as an attempt to remedy an unnecessary defect in the method adopted for decomposing the carbide.

Cool generation is the object desired, and if this be attained it is not a matter of great importance whether the acetylene be generated (1) by dropping carbide into water, (2) by allowing water to rise to carbide, or (3) allowing water to fall upon caarbide. When carbide is dropped into a large volume of water under suitable conditions, cool generation is effected provided that the live carbide is not allowed to become buried in a bed of lime sludge at the bottom of the generator, but a considerable quantity of gas is lost owing to the solubility of acetylene in water. When either the second or third method of decomposition is adopted, it is necessary to be able to control the rate of decomposition to ensure that overheating shall not occur. As a general rule, generators in which water "drips" or is sprayed over carbide should be avoided because it is in such generators that overheating most commonly occurs.

Careful and intelligent operators can decompose carbide by any of the three processes with satisfactory results, but ignorant or careless operators may obtain very unsatisfactory results with the same methods of decomposition and the same apparatus.

The Cost of Acetylene.—The cost of acetylene as compared with coal-gas depends upon local conditions, but for domestic lighting the writer would not recommend the substitution of an acetylene installation for coal gas supplied from a local gasworks when coal-gas can be obtained for 5s. per 1,000 cubic feet or less although well aware that acetylene is commonly regarded as equivalent to coal-gas at about 3s. to 3s. 6d. per 1,000 cubic feet. In this country the field for acetylene as an illuminant is limited under existing prices to the lighting of country houses, churches, or villages in districts not provided with a satisfactory public gas supply, and to portable appliances for various purposes.

GENERAL BUILDING NEWS.

METHODIST CHURCH, YORK.—The stone-laying ceremony of a Primitive Methodist Church in Monkgate, York, took place recently. The church will occupy a site adjoining the York Home for Nurses, Monkgate. There will be seatings for 400 on the ground floor and 375 in the gallery, making a total of 775. The church will be entered by two doorways opening into a vestibule, and the gallery will be approached by two flights of stairs in the angle towers, one of which terminates in a spire rising to a height of 75 ft. from the ground. The gallery will have circular ends. The Sunday-school premises will be in the rear, and on the ground floor will contain a lecture-room and infants'-room, each accommodating 100 persons. The assembly-hall is on the first floor and will accommodate 400 scholars There will be ten classrooms of different sizes and also minister's and choir's vestries. Ample kitchen and lavatory provision is arranged. The front will be faced with Ruabon bricks, the dressings being of Morley stone. The total cost, exclusive of the land, will be about 6,000*l.* Mr. George Mansfield, of York, is the builder, and Mr. F. W. Dixon, of Manchester, is architect.

RESTORATION OF EDLINGHAM CHURCH, NORTHUMBERLAND.—The restoration of this interesting specimen of Early Norman architecture having been completed, the opening service was held recently. The alterations and additions include new roof, an improved system of drainage, a new pulpit, a new lectern, new doors, and new windows, although it should be mentioned that on account of the great historic interest attached to the building, and because every stone is beautifully age-stained as well, it was decided to allow each window opening to remain unaltered, so as to preserve as far as possible the historic memories associated with the church. The floor which was raised 120 years ago above the bases of the fine Norman pillars has been lowered to its original level. The nave has been roofed and ceiled with pine, as enough was not forthcoming, unfortunately, to admit of oak being repeated. The new seating accommodation, however, is of oak. The cost of the restoration is estimated at over 1,000*l.* Mr. A. B. Plummer, diocesan surveyor, Newcastle, was the architect for the nave and tower; Messrs. Gradon & Son, Durham, the contractors; Mr. Caröe, London, the architect for the chancel, representing the Ecclesiastical Commissioners, who are responsible for that part of the scheme, and who have executed that portion at their own expense. Mr. Percy Appleby, Newcastle, was responsible for much of the carving in connexion with the scheme. —*Alnwick Gazette.*

WESLEYAN CHURCH, WEST BRIDGFORD, NOTTINGHAM.—A new Wesleyan church was opened at West Bridgford on the 21st ult. The building is situate at the junction of Lady Bay-road with Trent Boulevard. The building, which is intended for a Sunday school until the church proper can be erected, is 58 ft. in length by 31 ft. in width, and has seating accommodation for 300 persons. At the rear is a large room measuring 30 ft. by 17 ft., and two smaller rooms, 17 ft. by 17 ft. and 17 ft. by 22 ft. respectively, to serve as vestries and classrooms. On the south side are the heating-chamber, kitchen, &c. The front of the church, facing the Boulevard, is faced with Coxbench stone; the sides are of red brick. The porch is 19 ft. high by 8 ft. The interior fittings are of Columbian pine, stained and varnished. The heating has been carried out on the low-pressure hot-water system, and the lighting is by gasoliers. The contract for building the church, which was placed in the hands of Mr. T. Barlow, has amounted to over 2,000*l.* Mr. A. E. Lambert was the architect.

CHURCH, PENLEY, ELLESMERE.—The Bishop of Lichfield recently dedicated the new Church of St. Mary Magdalene at Penley. The new church has been designed by Mr. Hodgson Fowler, of Durham, at a cost of 2,500*l.* It consists of nave and chancel of local red stone, with a roof of red Ruabon tiles; the chancel fittings are of oak.

MEMORIAL CHAPEL, LEICESTER.—The new Robert Hall Memorial Chapel, Narborough-road, Leicester, has just been opened. The new building stands at the junction of the Narborough and Upperton roads. The corner of the two roads is emphasised by a tower which rises from the ground some 70 ft., and is surmounted by a lead-covered octagonal spire. The main entrances to the chapel and school are in the Narborough-road (north-east end of the buildings); the choir, deacons' and minister's entrance being in the Upperton-road. In plan the building is almost a parallelogram, with shallow transepts on either side. The rostrums are placed at the north-west end, with the baptistry underneath the upper one, which is sunk below the chapel floor. It is entered from either side of the chapel, and exit is given into the adjoining corridor, which gives access to the various vestries. The floor of the chapel is formed of pitch-pine wood blocks, and has a slope towards the rostrums. The seating is in pitch-pine, and will accommodate 850 persons. The floor of the lower rostrum is about 2 ft. 3 in. above the chapel floor, and is surrounded with a mahogany hand-rail, supported on wrought-iron brackets. The upper rostrum, which overhangs the baptistry, is approached from the lower one, and is executed in pitch-pine, with selected pitch-pine panels. At the rear of the rostrums an elliptical chancel arch rises and separates the choir stalls from the chapel. All the electric light fittings are of brass. The roof is one span of 48 ft., and is executed in Oregon pine. The chapel and the whole of the building are heated on the hot-water low-pressure system. The windows and a large number of the upper panels of the doors are filled with stained glass; and all the corridor and lobby floors are finished with Venetian marble mosaic. A ladies' vestry is provided at the north-west end; also minister's and deacons' vestries. The school, which adjoins, contains a lecture hall. At each end of the hall galleries are constructed to be used for several classes. The roof is an open timber one in Oregon pine. A large infants' classroom is placed near the school entrance (south-east end). The men's classroom, which is approached by a separate entrance, is placed at the rear on the first floor, and has an area of 500 sq. ft. The building is carried out in the Early Tudor style. The iron casements were supplied by Messrs. Hope & Sons, Birmingham; the electric light fittings by the Birmingham Guild of Handicraft; the heating work was carried out by Messrs. Ashwell & Nesbit, Leicester; the stained glass by Mr. Walter J. Pearce, Manchester; the mosaic work by Messrs. Diespeker & Co., London; and the folding partitions by Messrs. Peace & Norquoy, Manchester. Mr. Walter Brand, of Leicester, is the architect, and Messrs. J. E. Johnson & Sons the builders.

NEW PHYSICAL LABORATORY, ROYAL BELFAST ACADEMICAL INSTITUTION.—A new physical laboratory has just been completed at the Royal Belfast Academical Institution. Among the principal changes is the conversion of the house which was, until June last, occupied by Dr. Sheldon into new classrooms. The new physical laboratory, which formerly was the ground floor of Dr. Sheldon's house, has been fitted up with all the most modern requirements and fittings. The floor is laid with oak wood blocks on a solid concrete foundation, the whole of which is insulated from the walls, as is also the special stone table. Adjoining the laboratory is the lecture-hall. A raised platform has been constructed in this room, so that every pupil has an unimpaired view of the demonstration-table. The contractors were Messrs M'Laughlin & Harvey, and the architects Messrs. Blackwood & Jury.

ENLARGEMENT OF KENDRAY HOSPITAL, BARNSLEY.—Ald. Wilkinson, J.P., Chairman of the Sanitary Committee of Barnsley Town Council, laid the foundation-stone on the 28th ult. of an extension of the Kendray Hospital for infectious diseases. The enlargement will be erected at a cost of 7,541*l.*, from designs of Mr. J. H. Taylor, Borough Surveyor, and will contain twenty-eight beds, making the total accommodation of the hospital seventy beds.

MEMORIAL CROSS, CORNWOOD, DEVON.—A granite cross has been erected at Cornwood in memory of the late Lord Blackford. It is octagonal on plan, the base being formed of three steps, and the shaft tapering towards the cross. The total height is about 15 ft. Around the top step is an inscription in which Lord Blackford's services to his country for twenty-five years in the Colonial Office are referred to. The cross has been erected from the design of Messrs. Hine & Odgers, architects, Plymouth.

NEW PARISH HALL, PLYMOUTH.—The new parish hall of St. Simon's, Plymouth, has been opened by the Bishop of Exeter. Affording accommodation for about 500, it has a single-span roof with barrel ceiling, having moulded ribs, the monotonous Portland stucco of the neighbourhood being abandoned for brick and Bath stone, while the tints of the interior are governed by the green-stained woodwork. Mr. Ambrose Andrews, of Plymouth, is the builder, the architect being Mr. Harbottle Reed, of Exeter.

WORKHOUSE INFIRMARY, SUNDERLAND.—This building has been erected on ground adjacent to the local workhouse. It will, when finished, have cost about 40,000*l.*, the architects being Messrs. W. and T. R. Milburn. The new infirmary, which is designed to accommodate 200 patients, really consists of four departments—an administrative block, a pavilion for male inmates, a pavilion for females, and a maternity hospital. Externally the buildings are of brick, faced with Sherburn House bricks. The lighting is by electricity, derived from the Corporation power stations; and the heating is accomplished by means of the American Radiator Company's system. The buildings are fireproof; and fire-escape staircases have been constructed on the outside of all the premises. The contractors who have carried out the work are Messrs. D. & J. Ranken, of Sunderland. Mr. A. J. Wilkins has acted as clerk of the works.

EMPIRE THEATRE, HACKNEY.—A new theatre of varieties has been erected at Hackney, in Mare-street. The new theatre is fitted with the electric light, has a sliding roof 74 ft. above the floor, and is decorated in gold, buff, and white. The architect of the building is Mr. F. Matcham; the builders are Messrs. F. and H. F. Higgs; and the work of construction has been carried out under the superintendence of Mr. J. F. Revill.

BARRACKS, SALISBURY PLAIN.—Mr. H. Lovatt, of Wolverhampton and London, has obtained the contract for building the barracks decided some time ago to be placed on Salisbury Plain. The contract amounts to over 1,000,000*l.*, and the buildings are to contain quarters for eight battalions of infantry. A village is to be built by the contractor to accommodate the large number of men required for the works, and a railway has been constructed by the War Department from Ludgershall to Tidworth, which will be permanent.

FOREIGN.

UNITED STATES.—The conditions regulating the competition for the soldiers' monument in Philadelphia seem to be satisfactory to American architects, except that the premiums are considered inadequate, only 3,000 dols. having been appropriated to pay five prizes in a competition for a structure to cost nearly 500 000 dols. The award is to be entrusted to a jury of architects and sculptors selected by the T-square Club and the Philadelphia Chapter of the Institute.——The Commission appointed by Congress to prepare a plan for the improvement of the city of Washington has arranged for the preparation of two models, one showing the city in its present condition, and the other representing the scheme which the Commission advises, both of which are to be placed in the Corcoran Art Gallery for public inspection and criticism. ——The death is announced of Mr. Adolph Robert Kraus, a well-known sculptor, of Boston. He was in receipt of a pension from the German Government for conspicuous merit as an artist. One of his principal works in America is the Massacre Monument on Boston Common.——A valuable deposit of marble has been discovered near Fort Bowie, Arizona. Its main ledge is about 1,000 ft. in width, and is about three miles in length. The stone is of various colours, but the striking features of the discovery are a vein of pure white marble about 75 ft. in width, and a long ledge of intensely black stone. Much of the white marble is stated to be as good in quality as the Italian, and superior to that so extensively raised in Vermont.

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MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. W. B. G. Bennett, who has been for twenty-six years Borough Engineer of Southampton, is resigning his appointment in order to take up private practice, in partnership with his son, at Midland Bank Chambers, Southampton. ——Mr. S Inskip Ladds, architect, of 7, Doughty-street, Mecklenburgh-square, has opened a branch office in Market-place, Huntingdon.

OPEN SPACES AND OLD HOUSES.—The Corporation of Burnley have agreed to purchase, for 17,500*l.* the Towneley Hall estate from Lady O'Hagan, widow of the first Lord O'Hagan, Lord Chancellor of Ireland. Lady O'Hagan inherited the property from her father, Colonel Towneley, in whose family it has continued by direct descent from a very remote period. Charles Towneley formed the collections of marbles, terra-cottas, bronzes, gems, &c., bought for the nation in 1808-10.—Mr. H. H. Raphael, who bought the Gidea Hall estate, Romford, four years ago, has offered to the Urban Council 14 acres of land, together with a lake extending over 6 acres, out of the park, for dedication to the public. The estate, which covers a total area of 500 acres, is one of those in Essex with which the Liberator Building Society was at one time connected, and was withdrawn from sale at auction on July 7, 1897, after a bid of 36,000*l.* The hall, standing near the road to Brentwood, was built in or about 1720 by Sir John Eyles, Bart., on the site of the manor-house which Sir Thomas Cooke, under a licence from the Crown to build a fortified residence, began in 1467, and his grandson, Sir Anthony Cooke, completed. Thomas was elected Lord Mayor in 1462. Anthony was tutor to Edward VI. and father of the learned daughters whose classical attainments Dr. Walter Haddon eulogised in an address to Cambridge University. A view of the house was inserted in Le Serre's account of Marie de Medici's progress from Harwich to London; she stayed there a day and a night, Charles I. escorting her from Chelmsford. The bridge of three elliptical arches at Gidea Hall is ascribed to James Wyatt.—Efforts are being made to secure 22 acres at Southfields, Fulham, to be vested in the Borough of Fulham; 15 acres of land at Deptford for 30,000*l.*; and 10 acres at Southfields, Wandsworth, for 24,000*l.*, and negotiations are in progress for the opening of the churchyards of St. Giles', Camberwell; All Saints' and St. Matthias, Poplar; and of Granville-square, Clerkenwell.—A Bill will be introduced next Session for vesting (1) Petersham Common, Petersham Meadows, and contiguous lands in the Richmond Corporation; (2) Ham Common in the Urban District Council of Ham; and (3) lands on the riverside between Nightingale-lane and Richmond Ferry and Half-mile Tree Point, near Kingston, in the Surrey County Council and other local Public Authorities, so as to secure the preservation of the view from Richmond Hill and the prevention of building on those areas. The measure provides for a free conveyance of the ground by Lord Dysart and the trustees of the will of his predecessor in title, and for the extinction of lammas and other rights of common over part of Ham Fields, with compensation to Lord Dysart and the trustees in respect of similar rights, and the sale or exchange of other portions of the Ham Lammas Lands. The Bill complements the project for purchasing the Marble Hill estate, 66½ acres, on the opposite side of the river, for 72,000*l.*, to be contributed by the Middlesex (12,000*l.*), London (36,000*l.*), and Surrey (10,000*l.*) County Councils, the Corporations of London (5,000*l.*) and Richmond (5,000*l.*), and the Councils of Twickenham (3,000*l.*) and Hammersmith (1 000*l.*). Marble Hill has frontages of 2,100 ft. to the river, and 1,750 ft. to the Orleans and Richmond roads. It is said that Lords Burlington and Pembroke designed the house for Henrietta Howard, elevated Countess of Suffolk by George II., who gave 12,000*l.* towards the cost of it; it was since tenanted by another Royal favourite, Mrs. Fitzherbert. Cobbett's "Memorials of Twickenham" relates that Pope planned the gardens, and Dean Swift stocked the cellar. The house forms an interesting specimen of the stately "villa" of its day. Prominence was given to the first floor, the ground and second floors having a comparatively low altitude. Mahogany wood was extensively used in the interior, the staircase and some of the room floors also being made of it. The property was offered for sale at the Mart in August, 1888, and withdrawn after a bidding of 52,000*l.*

SHALLOW UNDERGROUND TRAMWAYS. — The London County Council have issued a Report on shallow underground tramways, which contains a joint Report by the Tramways Manager and the Electrical Engineer of the Council on the construction and working of the Boston, U.S.A. subway, and on the rapid transit subway now under construction in New York, and an addendum by Mr. J. Allen Baker, Vice-Chairman of the Highways Committee. The Report is illustrated with maps and reproductions of photographs of existing shallow underground tramways similar to that which it is proposed to construct from Southampton-row to the Thames Embankment.

REFUSE DESTRUCTORS, BRADFORD.—An inquiry has just been held at the Bradford Town Hall by Lieutenant-Colonel A. C. Smith, R.E., one of the inspectors of the Local Government Board, into the application of the Bradford Corporation to borrow a sum of 93,000*l.* to provide for the erection of refuse destructors at Greengates, Fairweather Green, Low Moor, Tong, and Southfield-lane, and for additions and new works at the present Sunbridge-road and Hammerton-street destructors, respectively. The Town Clerk (Mr. F. C. Stevens) conducted the case for the Corporation, and was accompanied by the City Surveyor (Mr. J. H. Cox), the City Architect (Mr. Edwards), the Medical Officer of Health (Dr. W. A. Evans), and the Cleansing Superintendent (Mr. J. McTaggart), and others. The only opposition offered was with respect to the Low Moor and Fairweather Green schemes.

THE CHURCH CRAFTS LEAGUE.—The second annual meeting of the League was held on Thursday, November 28, at London House, 32, St. James'-square, the Bishop of Rochester in the chair. The adoption of the annual report was moved by the Bishop of Rochester, who referred at length to the encouraging manner in which the League had gone forward during the past year. The membership had been doubled, both amongst the artists and the ordinary members, and the work done through the League had increased proportionately. The applications received for advice during the year had numbered ninety-one, and in every case this had been given free of all cost to the inquirer. Work had already been placed in twenty-six churches, while a large number of schemes were in progress, and would come into next year's statistics. Meetings of the League had been held at Oxford (through the kindness of Dr. Biggs) and at Mr. Stirling Lee's studio at Chelsea, and the results of these gatherings had been so satisfactory that it had been decided to arrange another series during the coming winter. The Committee had also taken in hand the compilation of a book of simple designs for churchyard monuments, with suggestions for the use of clergy as to the protection of churchyards from disfigurement, and it was hoped that this might help considerably towards a much-needed reform. Mr. T. Stirling Lee seconded the adoption of the report, and referred to the wide area over which the work done by the artist members had been spread, extending as it did to the Colonies. Mr. Dyer Edwardes proposed, and Mr. Henry Holiday seconded, that the Bishop of Rochester be re-elected President, and this was agreed to unanimously. The election of three ordinary and three artist members of the Committee to fill the places of those retiring under the Rules of the League was then proceeded with, and resulted in Canon Rhodes Bristow, Dr. F. D. Drewitt, Mr. J. T. Micklethwaite, Mr. R. Anning Bell, Mr. T. Stirling Lee, Mr. C. O. Skilbeck being elected, while Mr. T. Dyer Edwardes was elected treasurer for the ensuing year. An election of artist members followed, the successful candidates being Mr. Robert Marchant (architect), Mr. Robert Hilton (metal-worker), Mr. Jasper Brett (glassworker), Mr. Hilyard Swinstead (painter), and Mr. John D. Seddon (architect). At the conclusion of the business, discussion took place on the future work of the League, in which Canon Armitage Robinson, Mr. J. E. Dowson, Rev. Percy Dearmer, and others took part.

INSTITUTE OF BRITISH DECORATORS.—In connexion with the Northern Branch of the Institute of British Decorators a lecture was given at Sheffield, on the 28th ult., by Mr. G. C. Haité, on the subject "Decoration and Decorators, a survey of the past and present." Mr. Haité dealt chiefly with the domestic aspects of decoration, referring to it as the art which surrounds us during the most impressionable period of our lives—the days and hours of childhood—and which beautifies the surroundings of the greater part of our lives. Its influence for good or bad was much stronger than was generally imagined, and, in his opinion, every nursery should be decorated in such a manner as would tend to educate and elevate the infant mind. Until quite recently, decoration had been a luxury only obtainable by the rich. Since the introduction of wall-paper, however, it had become accessible to the people, and he thought that there was no longer an excuse for anyone who desired to have an artistically decorated home failing to get it. Decoration was at its lowest ebb, perhaps, at the beginning of the last century, but after the great Exhibition of 1851 a change became manifest. Decoration was not yet, however, what it ought to be. Some exponents of what is called fine art assert that there are as laws no general principles to govern art expressions, but this was wrong. The great principle which applies to all art expression, as it does to life itself, was "fitness." Let the expression of art be of our own time and our own faith, accepting, and content only with the best to be had, and rendering it capable of bearing the tests of logical reasoning. Exceptional opportunities for the decoration of public buildings and palaces were few. In a humble way, however, in domestic decoration, problems occurred that called for all the judgment, experience, and originality likely to be at the decorator's command. Substitutes for hand work were now supplied most plentifully, and in the right choice and use of these materials the decorator of to-day had great scope for the display of individuality and skill. It was no use inveighing against the use of these materials, for they were an evidence of the times, and many of them of great excellence. In fact, the manufacturer had outstripped the decorator. He had supplied media, artistic in form and colour, at a price possible for all; and it was for the decorator to apply these with skill, taste, and judgment. Some people contended that decoration was decadent; but if such were the case, it was because of the commercialism imported into its practice by the huge combinations of decoration with other trades In conclusion, he urged that decorative art was a necessity in the progress of civilisation, and should therefore be educational; that manufactured goods were not essentially antagonistic to the art of the decorator; that it was desirable that the art of the decorator should be kept apart from other trades instead of being undertaken by linendrapers and furnishing firms. He submitted as a scheme to them that the decorators of the country should appoint a council through this Institute, to organise an exhibition of decorated rooms in London, to be kept open say for three months, and that afterwards it might be sent to the larger provincial centres. He thought such an exhibition would go far to abolish what he designated as the "Tottenham Court-road" school.

ELECTRICAL RAILWAYS, LONDON AND THE SUBURBS.—Amongst the numerous projects for which powers will be sought in the course of the ensuing Session of Parliament we may cite the following schemes for electrical railways:—From Cannon-street Terminus to Southwark Bridge-road, Kennington, St. John's Hill, Wandsworth, and Hartfield-road, Wimbledon; Hammersmith to Barnes, and West Strand to Piccadilly Circus and Hyde Park Corner, with subways at Charing Cross and Hyde Park Corner; Edgware Station to Finchley-road, Hendon, and Holly Bush Hill, Hampstead; Cannon-street and Queen-street to Rye-lane, Peckham, and the Penge entrance to the Crystal Palace; Shepherd's Bush and Hammersmith to Barnes, Knightsbridge, Charing Cross, Clapham Junction, and Marble Arch; Peckham Rye Common to Gracechurch-street and Barking-road, Plaistow; and Camberwell New-road to Nelson-street, Greenwich.

PROPOSED IMPROVEMENTS IN MANCHESTER.—A Bill has been prepared to authorise the incorporation of a company for acquiring a site that lies on the west side of Corporation-street and extends southwards to Market-street, between Cannon and New Brown streets, for erecting new buildings on that area, and for making new streets—one from the junction of Corporation and Cannon streets to the junction of Market and New Brown streets, the other from the junction of Cannon and New Brown streets to the junction of Corporation and Market streets, which will furnish more direct lines of communication from the Manchester Exchange and Victoria Station to Shudehill Market. The contemplated City Circle underground railway, to be worked with electrical power, will have its chief station at the corner of Tod-street and Long Millgate, near Victoria Station and the Cathedral schools, with a generating station on the west side of the Corporation hydraulic power works, by the Rochdale Canal.

MANCHESTER HOUSING SCHEME AT BLACKLEY.—The Housing Sub-Committee of the Sanitary Committee of the Manchester City Council, after inquiry with the City Surveyor, have decided upon new plans for the model cottages to be built at Blackley for submission to the Council and to the Local Government Board. In a great degree the plans approved follow the lines adopted in the building of model cottages at Leek, in Staffordshire, and have several improvements as compared with the original design. The chief additions are a bathroom and a bedroom, the former room being placed on the ground floor immediately behind the kitchen fireplace. Access to it is obtained from the scullery, from which it can at pleasure be cut off when in use by folding doors. The bathroom is to be made available for washing purposes generally. The third bedroom is to be in the centre of the building, the floor being 3 ft. 6 in. higher than that of the other bedrooms So far as the cost is concerned, the alteration in the original scheme for the erection of 203 cottages will involve an additional outlay of 7,000*l.*, and application to borrow this sum will have to be made to the Local Government Board if the plans are adopted by the City Council.—*Manchester Guardian.*

SCARBOROUGH MASTER BUILDERS' ASSOCIATION.—The annual meeting of the Scarborough Master Builders' Association was held at the Albemarle Hotel, on the 30th ult., Mr. A. W. Sinclair (President) occupying the chair. The annual report and balance-sheet, presented by Mr. R. H. Carr, were considered very satisfactory and were adopted. The officers for the ensuing year were re-elected as follows:—President, Mr. A. W. Sinclair; Vice-president, Mr. T. B. Jowsey; auditors, Mr. W. Malton and Mr. W. Tindall; secretary, Mr. R. H. Carr. Messrs. A. W. Sinclair, Moore, R. H. Carr, and Councillor Bland were elected the four delegates to represent the association upon the National Federation of Building Trade Employers of Great Britain and Ireland at the two half-yearly meetings.

SUNDERLAND AND DISTRICT BUILDING TRADES ASSOCIATION.—The annual meeting of the Sunderland and District Building Trades' Association was held on the 28th ult. in the Grand Hotel, Sunderland. In the annual report, which was read by

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Mr. W. H. Hope, the secretary, it was stated that there was one great question looming on the builders' horizon, as it did on the horizon of employers generally, and that was the great evil which was sapping the entire business relations of employers and employed. This referred to the action of the operatives in the way they worked in the different branches of the trade. The effect of the limitation of the amount of work to be done by a workman kept up the cost and militated against the letting of contracts, and, further, was handicapping this country enormously in its struggle to maintain its commercial supremacy. Mr. J. B. Stott was elected President, in the place of Mr. J. W. White, who retired.

NATIONAL REGISTRATION OF PLUMBERS.—The first of a series of papers for the winter session arranged by the District Council for Cardiff, South Wales and Monmouthshire, in connexion with the Worshipful Company of Plumbers, was delivered by the President for the year, Mr. W. H. Dashwood Caple, architect, at the Technical Schools, Cardiff, on Tuesday, the 26th ult., when there was a representative attendance of the master plumbers and operatives in the district. The subject of the President's paper was "Plumbing Notes," and it embraced the various branches of the work of the craft. At the conclusion of the paper there followed an interesting and instructive discussion. The other arrangements for the Session are as follows:—December 17, "The Plumber's Craft and the Registration Movement," by Mr. E. B. Sawyer; January 21, "Sanitation of our Homes," by Mr. E. J. Manders; February 18, "Roof Water and how to deal with it," by Mr. C. R. Williams; March 18, "Cardiff Water Supply," by Mr. W. H. Allen; April 15, a paper by Mr. Edwin Seward; May 20, "Some Defects in our Local Sanitary System from a Plumber's point of view," by Mr. E. J. Sawyer. The meetings will be held on Tuesday evenings at eight o'clock in the Technical Schools, Dumfries-place, Cardiff.

APPOINTMENT, WALTHAMSTOW.—At the last ordinary meeting of the Walthamstow School Board, held on the 22nd ult., Mr. H. Prosser, the Board's Surveyor, was appointed Architect and Surveyor to the Board at a commencing salary of 250*l.* per annum.

A HERALDIC CALENDAR.—An exceptionally well-designed and printed calendar for the coming year has reached us from Messrs. Archibald Constable & Co. with the title of "St. George's Kalendar." Its chief feature is some very boldly drawn heraldry. It is in book form, with shields charged with the Cross of St. George, and the three lions passant of England on the cover. Opposite each month is a coat of arms with helmet mantling crest printed in colours, including, among others, the arms of Howard, Courtenay Hastings, Berkeley, Scrope, and Clifford. The last named is particularly effective. The calendar is published at the very moderate price of 1s. net.

FIRE TESTS WITH DOORS.—The British Fire Prevention Committee again undertook a series of investigations at their Bayswater testing station on Wednesday. Mr. Edwin O. Sachs, chairman of the executive, presided, and among the principal visitors were Sir Joseph Renals, Bart. (lately Lord Mayor), Sir James Weeks Szlumper (lately Mayor of Richmond), Major Fox (London Salvage Corps), Captain Dyson (Windsor), and a number of representatives from the London County Council, the Local Authorities and principal fire insurance companies. The afternoon was devoted to tests with doors, firstly, with two double deal doors and two double oak doors; secondly, with a single "Jarrah" wood door and a single "Karri" wood door, the thickness of the doors in each case being 2 in. The double oak doors appeared to have very considerable fire-resistance compared to the deal double doors, the test in each case extending to one and three-quarter hours. The "Karri" and "Jarrah" wood doors were, unfortunately, badly constructed by the makers, and, although the wood itself showed considerable resistance during a test of one hour, the fire appeared to get through where the joints had not been satisfactorily made. The full official reports will shortly appear in the usual way. It might be noted that the testing operations were somewhat hampered by the fog, all the photographs and records having to be taken by flash-light.

SEWER VENTILATION.—We have received from Mr. Joseph Aird, of Great Bridge, Staffordshire, a description of his tubular sewer-ventilating standard. The standard has a cast-iron base with an arm for connecting to the sewer branch, and the upper part is formed of wrought-iron or mild steel tubes, which can be built up to any reasonable height. The tops of the standards are fitted with cowls or wire guards. Mr. Aird claims that these standards can be utilised for the dual purpose of sewer ventilators and telegraph or telephone poles. Certainly any invention which reduces the number of poles or shafts in our streets is worthy of consideration. As a sewer ventilator, Mr. Aird's standard has advantages over cast-iron, as it can be carried up to a greater height and need not be as heavy.

WINDOW, NEWTON TRACEY CHURCH, NORTH DEVON.—A new stained-glass window was unveiled on Advent Sunday at St. Thomas a Becket's church, Newton Tracey, near Barnstaple. The window, consisting of three lights, illustrates the parable of the "Pharisee and Publican," and is dedicated to the memory of T. H E. H. Dimond Hogg, who was a warden of the parish for twenty-one years. The work is from the studio of Mr. Gilbert P. Gammon, of London

CAPITAL AND LABOUR.

THE PENRHYN QUARRY.—Since work was resumed at the quarry on June 11 the number of men employed has steadily increased. During the last three quarry months 103 employés have been admitted—namely, during September, twenty-seven; October, forty; and November, thirty-six. Notwithstanding the short hours it is now possible to work, the production of slates continues very satisfactory, and it is expected that this month will show an output at the rate of 35,000 tons per annum. The district is still unfortunately in a very disturbed state. The usual weekly mass meeting of some of those on strike was held on Saturday evening.

SLATE TRADE.—Price-lists for 1902 have just been issued by the Dinorwic, Penrhyn, and Festiniog Quarries, and the Carnarvon ones will be out in a day or two. Prices show an upward tendency, but not sufficient to encourage foreign competition, especially with the rise in American slates, caused, no doubt, by better home demand. The Mineral Statistics for 1900 showed a considerable falling in tonnage value of Welsh slates.

LEGAL.

MARYLEBONE BUILDING DISPUTE.

THE case of White *v.* Harrow—Harrow *v.* the Marylebone District Property Co., came before Mr. Justice Joyce in the Chancery Division on the 29th ult. on a motion by the applicant White for a stay of proceedings of the action Harrow had commenced against the Marylebone District Property Company, Limited.

It appeared that White was the lessee of No. 24, High-street, Marylebone, from the trustees of the Howard de Walden estate for a term of about thirty years unexpired. By a deed dated August 3, 1899, White underleased the house for a term of twenty-one years to Harrow, together with all easements and appurtenances belonging to the premises. The lease contained a covenant that the lessee would not "object to any works to adjoining premises which might be sanctioned by or on behalf of the lessor or the superior landlord." The lease also contained the usual covenant for quiet enjoyment of the premises. It seemed that the Company, having acquired an interest in property adjoining No. 24, High-street, which formed part of the same estate, proposed to erect thereon some buildings which Harrow said would obstruct his light, and brought an action against the Company to restrain the Company from obstructing his light. These proposed buildings had been approved by the surveyor of the Howard de Walden estate. Mr. White, who was also interested in the Company, then took the present proceedings to restrain Harrow from prosecuting his action on the ground that it constituted a breach of the above-mentioned covenant.

At the conclusion of the arguments of Counsel, his Lordship came to the conclusion that the covenant in question prevented the lessee from raising objection to any building works on the adjoining premises which might have been so sanctioned, and accordingly stayed the proceedings taken by Harrow against the Company

Mr. Hughes, K.C., and Mr. Wace appeared for the applicant, and Mr. Younger, K.C., and Mr. E. Ford for the respondent.

ACTION BY FOREMAN CARPENTER FOR DAMAGES AND PERSONAL INJURIES.

THE case of Simons *v.* the Birkbeck Building Society came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Matthew, on the 2nd and 3rd insts., on the application of the defendants for judgment or new trial on appeal from verdict and judgment entered at the trial before Mr. Justice Darling and a common jury in the King's Bench Division on June 11 last. The case was reported in the *Builder* of June 15, 1901.

The facts were shortly as follows: The plaintiff, a foreman carpenter, brought the action to recover damages from the defendants for personal injuries sustained through the alleged negligence of the defendants in the following circumstances. The plaintiff, prior to the accident, had earned some 55s. a week. Having saved some money and being desirous of buying a house, and not having a sufficient sum laid by he borrowed some money from the Birkbeck Building Society. The loan was repaid in monthly payments, the plaintiff's wife being in the habit of taking the money to the Society. On August 13, 1900, however, the plaintiff took the money to the bank himself, and never having been there before, and on asking the porter where he should go, understood him to say "Third floor on the lift." The plaintiff looked round and seeing the entrance to the lift walked towards it. There was no light, and the plaintiff instead of walking into the lift fell down the shaft, a distance of about 15 ft., sustaining severe injuries, for which he claimed damages. For the defendants it was contended that the lift-door was only open some 8 in. or 10 in. at most, and that the plaintiff in opening it further had been guilty of contributory negligence. In the result the jury awarded the plaintiff 150*l.* damages, and judgment was entered accordingly. Hence the present application of the defendants, who asked for judgment or a new trial on the grounds that the verdict was against the weight of evidence and that the learned Judge had misdirected the jury.

In the result their lordships allowed the appeal, holding that there was no evidence of negligence on the part of the defendants, and entered judgment for them with costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

13,363.—A MACHINE FOR ROAD-MAKING AND KINDRED USES: *F. Behmer.*—By substituting a chisel-shaped tool for the hammer, and employing an anvil, the motor-driven machine for ramming paving material will serve also for working or splitting stone. An eccentric and a rod upon the shaft, which is driven with a belt from the motor-driven shaft, work the hammer; provision is made for angular or linear adjustments with a hand-wheel that works worm and sector gearing, a bell-crank lever, and other mechanism. Rollers upon rails enable the framing to be swung round the shaft on the carriage; the fore-carriage can take a rocking movement and be turned about for steering purposes; and worm-gearing will rotate in either direction the shaft on which are mounted the drums around which the steering chains are wound.

14,015.—A DOOR-CLOSING CONTRIVANCE: *G. F. Newman.*—The inner end of the closing-spring is hooked on to a sleeve that is joined at its upper end to a ratchet-wheel, whilst the outer end of the spring is hooked on to a groove within the casing. As the wheel rotates it moves—by means of a pawl that is pivotted upon the arm—a jointed door-closing arm. For checking purposes, two face-cams upon the axis reciprocate a piston with the turning of the axis. A spring valve allows the oil in the cylinder to freely flow through a spring-valve in one direction, but its return is prevented by means of a spring-controlled valve.

14,028.—AN APPARATUS FOR WINDOWS: *F. W Collier.*—The spindles of toothed wheels carry coiled springs which balance the sashes, the wheels being in gear with racks upon the sash stiles. The springs are discarded in the case of small sashes, which can be fastened at any height desired with springs that engage with the toothed wheels or spring-pins that engage with the racks.

14,063.—A COMBINED FUSE AND SWITCH: *G. C. Pillinger and A. Vandam.*—A switch arm for use upon distributing-boards is made of some insulating material, and its contacts are disposed for engagement with the terminals, the fuse having a support fitted with plugs that will bridge the contacts. In another form the switch arm carries the fuse wire directly which is fastened with screws.

14,069.—A LIGHTNING CONDUCTOR: *A.-G. Elektricitatswerke vorm. O. L. Kummer & Co.*—The diverging spark gap horns of the conductor are fitted, near the spark-originating position, with cases of para-magnetical material having a horseshoe-shaped section, which may be carried upwards to some extent.

14,083.—MOULDING MACHINERY FOR BRICKS, TILES, &C.: *W. Wilkinson.*—The driving shaft and the eccentrical shaft of the press are in one and the same vertical plane, the latter being worked with a pinion and a spur-wheel; a geared pinion turns a pug-mill shaft, which is set at a level lower than that of the driving-shaft; across the pug-mill shaft is another shaft which carries gearing that rotates intermittently a moulding cylinder in front of the pug-mill; the rebated foundation block of the press is bolted between rebated side frames.

14,097.—URINALS: *F. Shanks.*—The inventor uses one slab, or more, for building up the back of the urinal, of which the stalls are separated with pillars which are made wider at the back, and so as to afford enough space in front of the slab for cleansing and flushing purposes. Capping blocks may be adapted to join the pillars to the back.

14,114.—REMOVAL OF PAINT, &C.: *A. Klee.*—For removing varnishes, paints, and so on the inventor devises an emulsion which is compounded of linseed oil, soda, Venetian turpentine, water, and spirits of wine.

14,152.—A COMBINED DRY CLOSET AND DESTRUCTOR FURNACE: *F. P. Smith.*—These are made in a portable form and are intended for use in camps, &c. Above a grate is a convexed plate on to which the refuse is passed through an opening, receptacles for the ashes are rocked upon cross-shafts so as to cast their contents into the grate from which they are conveyed between triangular bars to a receptacle at the base, a flue is connected to the upper portion of the furnace, and over it the closet seats are arranged; the lower portion of the furnace is joined to a lower flue by a pipe that leads into the main chimney; when the damper is

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shut the supply of air is drawn through the seats and the flue, the lower flue carries away the heated gases so as to heat the plate upon which the soil has accumulated.

14,202.—A DUST BIN: *H. Smith.*—The bin has a sloping bottom-plate and a hinged lid, the bottom constitutes a shoot for the discharge of its contents when the bin is turned upon the pivot which supports it upon a casing that is fixed in the wall, the turning of the bin is regulated with a fastening and a stop-piece.

14,208.—AN APPLIANCE FOR WINDOWS: *F. M. Chambers and W. T. Christian.*—The inventors seek to prevent sashes from rattling; to the frame and sashes they attach pins on which are fitted perforated straps joined together with elastic rings; in one adaptation a buckle of one strap takes the tongue of the other, whereby the tension of the ring is limited in its extent; in another form the loose end of one strap is inserted through the ring and a buckle.

14,219.—TILES AND FACING-PLATES FOR WALLS, &C: *F. Beer.*—That they may the better take cement or plaster the glass facing-plates and tiles are roughened with an admixture of silicate of sodium or potassium 1 part, and dry pulverised carbonate of lime 2 parts. When that is dry a backing of plaster or cement is applied, the plaster being wetted with formic aldehyde or alum to render it insoluble, infusible, and non-putrescible, or gauged or mixed with water that contains gelatine.

14,243.—VALVES OF VARIOUS KINDS: *S. E. Alley.*—The piston of a reducing-valve that has an inverted conical valve joined to a piston of greater area is provided with a flexible diaphragm fastened with a screwed washer on to the casing and enclosed with a pierced cover. A screwed spindle will serve to make the valve available for a stop-valve, or that object can be effected by the employment of a headed stud which is screwed into the end of the spindle so as to work within a recess in the valve. In another form a washer and a flanged ring retain the diaphragm between them.

14,253.—AN ATTACHMENT FOR DOOR KNOBS AND HANDLES: *J. E. Cope.*—One end of a squared spindle is screwed for taking a loose knob, and another knob is affixed to its other end; a squared hole in the loose knob takes a squared collar that will slide upon the spindle, which has an ordinary rose at one end, and at the other end a rose formed of two hinged parts kept in place with screws. For adjustment, one passes the spindle through the door, threads upon it the rose, the collar, and the loose knob, and then fixes them all in position by inserting the hinged rose, when the spindle has been forced forwards for engaging the collar and the loose knob; a metallic mounting fastened in the knob is screwed into engagement with the spindle, when the knobs are of wood, china, or glass.

14,278.—MANUFACTURE OF PORTLAND CEMENT: *H. Passow.*—The materials are melted down and granulated as oxygen, air, or gases charged with oxygen are passed through them. A cement produced by grinding blast-furnace clinker similarly treated may be added to ordinary Portland cement. The slag, &c., may be treated with air in an apparatus after the Bessemer-converter kind.

14,289.—A TUMBLER-SWITCH: *A. W. B. Pearson.*—In order that the contact-lever when in the "off" position shall rise to an almost horizontal direction it is fashioned in a short length and the operating lever is curved accordingly; for ensuring a quick break a pawl is set in engagement with the lever, and will so remain until the movement of the handle is nearly finished.

14,295.—LOCKS FOR DOORS: *J. M. Burguy.*—A follower which is worked by handles upon a spindle, and an especially shaped spring work the latch-lock for a pair of folding-doors, a lever worked by a key outside and by a stud inside controls the lock-bolt that may be shot either behind the latch-bolt or into a notch so that by keeping it drawn back the doors may serve as swing-doors. The stud also will put the lock-bolt into a midway position to lock the latch-bolt and the key will not draw it back, teeth upon a flange on the lever will engage with teeth upon the edge of the bolt by the action of a spring, whereby the lock-bolt will be held in that position. In another form a key is used on either side to turn the bolt, and when the bolt has been put into the intermediate position any one upon the opposite side is prevented from dislodging the key from the keyhole, since his attempt to turn it will be frustrated by a spring which is affixed to the bolt and engages with a notch cut in the lever.

14,317.—A FASTENING FOR WINDOW SASHES: *W. Braby.*—A bevelled latch-bolt to be shot with a spring into engagement with the catch operates in the casing upon the meeting-rail of the lower sash, and when it has been so shot is made fast with a bar that falls behind a shoulder upon the bolt. For releasing the fastener one pulls the handle, thereby the lever will raise the bar and the bolt can be moved back; as the bolt is drawn away, a small bolt upon the top of the lever becomes forced forwards and rests upon the casing, then one holds up the bar until the closing of the window forces the latch-bolt back. In order that one's two hands may be free for lifting the sash, the latch-bolt is first drawn back, and then a plate that is hinged on to a pivoted plate is thrust between the catch and the end of the bolt.

14,320.—BURNERS FOR BLOW-PIPES: *J. H. Letcher.*—Gas and air are supplied through a fixed plug, upon which rotates a sleeve which carries a radial set of blowpipe-burner tubes, and as each burner tube is turned into position for work, the gas and air are turned on automatically through ports made in the plug and the sleeve. A middle tube in the plug, and a passage (which also feeds a pilot flame) and ports convey the gases to the outside burner tube, as the air flows up the hollow of the plug and through a port into the inside tube. Another arrangement of the ports provides for the shutting-off, either wholly or partially, of the gas before the air-blast is acted upon by the turning-sleeve.

14,341.—A COWL OR TOP FOR VENTILATING PIPES, CHIMNEYS, &C.: *G. McCaul.*—The top or cowl is fashioned with a hollow conical drum having ducts of which the flared ends will take the wind and so set up a draught, whilst rain is kept out with a conical hood resting upon legs.

14,365.—BRICKS: *J. Borgar.*—The inventor devises a brick of which the face is fashioned with a rib or flange, his object being to dispense with pointing and to render the mortar invisible from without.

14,373.—AN ELECTRICAL CUT-OUT.—*H. O. Farrell.*—The fuse-wires attached to removable bridges are disposed upon the fuse-boards, and the contact surfaces are placed at right angles with the plane of the bridge-pieces; in one arrangement the bridge that carries the fuse is E-shaped, the middle projection being placed between the contacts; in another form L-shaped contacts are fitted against a dividing-bridge made upon the base; the fuse is laid in a groove and spring-contacts are set upon the upper bridge.

MEETINGS.

FRIDAY, DECEMBER 6.

Architectural Association Discussion Section.—Mr. S. Perks on "The Ethics of Dilapidations." 7.30 p.m.

Institution of Junior Engineers. (Westminster Palace Hotel).—Paper on "Street Railway Construction for Electric Traction," by Mr. F. S. Pilling. 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. R. W. A. Brewer on "Gas-Engine Construction." 8 p.m.

Birmingham Architectural Association.—Mr. H. H. Statham on "The Architectural Treatment of Bridges."

Glasgow Architectural Craftsmen's Society.—Mr. C. Ernest Monro on "Hotel Planning and Construction." 8 p.m.

SATURDAY, DECEMBER 7.

British Association of Waterworks Engineers.—Winter meeting of the Association, to be held at the Geological Society's Rooms, Burlington House, London.—1. Ballots for the Council and Officers for 1902-3, and for new members and Associates. 2. Discussion on Mr. Ingham's paper, entitled "The Design, Construction, and Cost of Open and Covered Service Reservoirs." 3. Paper, entitled "French Practice in the Manufacture of Cast-Iron Pipes," by Mr. A. G. Cloake. 4. Paper, entitled "English Practice in the Manufacture of Cast-Iron Pipes," by Mr. S. H. Terry, M.Inst.C.E. 5. An abstract, entitled "American Practice in the Manufacture of Cast-Iron Pipes" (from the *Engineer*), will be taken as read. 6. Discussion on the three papers above mentioned. 10.30 a.m.

British Institute of Certified Carpenters.—Annual general meeting, Carpenters' Hall. 6 p.m.

City of London College Science Society (White-street, Moorfields, E.C.).—Visit to the works of the Baker-street and Waterloo Railway, by permission of the contractors, Messrs. Perry & Co.

MONDAY, DECEMBER 9.

London Institution.—Mr. Francis Bond on "Mediæval Monks and Monasteries." Illustrated. 5 p.m.

Surveyors' Institution.—Professor W. Somerville on "Artificial Manures." 8 p.m.

Institution of Electrical Engineers.—Annual dinner.

Clerks of Works' Association, Carpenters' Hall.—Monthly meeting. Paper by Mr. T. Stirling, jun. 8 p.m.

Bristol Society of Architects.—Mr. Harold Smith on "Paris, Past and Present," with limelight illustrations. 8 p.m.

TUESDAY, DECEMBER 10.

Institution of Civil Engineers.—(1) Further discussion of Mr. J. A. F. Aspinall's paper on "Train Resistance;" 2) Mr. B. Donkin on "Motive Power from Blast Furnace Gases." 8 p.m.

Cardiff, South Wales, and Monmouthshire Architects' Society.—Paper by Mr. J. Coates Carter. 8 p.m.

Institution of Electrical Engineers (Glasgow Section, 207, Bath-street).—Mr. W. Murray Morrison on "Aluminium: Notes on its Production, Properties, and Use." 8 p.m.

WEDNESDAY, DECEMBER 11.

Society of Arts.—Professor Ernest Wilson, M.Inst.E.E., on "Aluminium." 8 p.m.

Institution of Civil Engineers.—Students' visit to Messrs. Maple & Co.'s New Electricity-driven Cabinet Factory in Highgate-road. 3 p.m.

Northern Architectural Association.—Mr. J. M. Carr on "Terra Cotta, &c.," with lantern illustrations and models. 7.30 p.m.

Institution of Electrical Engineers (Birmingham Local Section).—Dr. W. E. Sumpner will read short papers, "On the Power Factor of Alternate Current Circuits," "On the Workshop Testing of Dynamos and Motors." 7.30 p.m.

St. Paul's Ecclesiological Society.—Paper by Mr. Leopold G. Wickham Legg, B.A., entitled "Suggestions for the Reconstruction of the Coronation Ceremonies," illustrated by limelight lantern views of the Regalia, the Royal P ssions, and Westminster Abbey and Hall. p.m.

THURSDAY, DECEMBER 12.

Manchester Society of Architects.—Mr. Halsey Ricardo on "The Revival of Gothic Architecture," illustrated by lantern slides.

Sheffield Society of Architects and Surveyors.—Mr. A. Jeffery on "Stained Glass."

Leeds and Yorkshire Architectural Society.—Rev. H. A. Hall, M.A., on "Some Village Churches of North Devon." 6.30 p.m.

Institution of Electrical Engineers (Great George-street, Westminster, S.W.).—1. Conclusion of discussion on "The Physical Properties of Certain Aluminium Alloys and Some Notes on Aluminium Conductors," by Professor E. Wilson. 2. "Some Principles Underlying the Profitable Sale of Electricity," by Mr. Arthur Wright. 8 p.m.

FRIDAY, DECEMBER 13.

Architectural Association.—"Travelling Students Notes," by Mr. J. E. Forbes. 7.30 p.m.

SATURDAY, DECEMBER 14.

Institution of Junior Engineers.—Visit to the Croydon Combined Electric Light and Traction Works. 3.15 p.m.

Dundee Institute of Architecture.—Visit to Arbroath and Hospitalfield.

SOME RECENT SALES OF PROPERTY

ESTATE EXCHANGE REPORT.

November 20.—By DRIVER, JONAS, & Co. (at Usk).

Raglan, Mon.—Enclosures of land, 47 a. 1 r. 14 p., f.	£635
Cottage and meadows, 15 a. 2 r. 24 p., f.	505
Tregare, Mon.—Enclosures of land, 29 a. 1 r. 26 p., f.	825
Penrhos, &c., Mon.—Coed-y-felin Farm and Duke's Gorse, 53 a. 2 r. 15 p., f.	400
Llantilio-Crossenny, Mon.—Porthgwyn Farm, 13 a. 0 r. 28 p., f.	300
Tregare, &c., Mon.—Enclosures of land, 131 a. 0 r. 1 p., f.	2,045
Common Farm, 95 a. 0 r. 12 p., f.	1,130
Two cottages and 18 a. 1 r. 6 p., f.	710
Llangoven, Mon.—Cottage and 1 a. 0 r. 20 p., f.	100
Trecastle Farm, 242 a. 1 r. 38 p., f.	3,000
Enclosures of land, 21 a. 2 r. 34 p., f.	400
Cwmcarvan, &c., Mon.—Cae-Garw Farm, 254 a. 2 r. 37 p., f.	2,170
Various cottages and 34 a. 2 r. 27 p., f.	885
Various enclosures, 39 a. 3 r. 12 p., f.	662
Mitchel Troy, Mon.—Box Cottage and 10 a. 0 r. 39 p., f.	310
Redwern Farm, 9 a. 3 r. 9 p., f.	240
Freehold house and 8 a. 0 r. 35 p.	100
Various cottages and 24 a. 1 r. 2 p., f.	760
Various enclosures, 14 a. 3 r. 28 p., f.	315
Penallt, Mon.—Various cottages and 28 a. 0 r. 20 p., f.	641

November 21.—By FULLER, MOON, & FULLER (at Sydenham).

Sydenham.—2 and 3, Holmshaw-r l., with stabling, yard, &c., f.	1,730
Adamsrill-rd., plot of building land, f.	200

November 22.—By Messrs. SPELMAN (at Norwich).

Norwich.—54, Calvert-st., f.	100
73 and 75, Gladstone-st., f.	268

November 25.—By T. C. COX.

Wethersfield, Essex.—Freehold brewery premises, with fifteen tied houses and various cottages, f.	17,000

By ELLIOTT, SON, & BOYTON.

Hanwell.—Lower Boston-rd., Floral Villa, f.; also two plots of land in rear, u.t. 3 yrs., r. 14*l.*	650

By T. H. CURRIE & Co.

Chiswick.—Hogarth-lane, Hogarth House, area ¾ a., c.	1,500
Hammersmith.—8, Faroe-rd., f.	420
Shepherd's Bush.—7, Grenside-rd.; also i.g.r. 4*l.*, u.t. 66 yrs., g.r. 4*l.*	450
Askew-rd., a piece of freehold land	300

November 26.—By BELTON & SONS.

Hanley, Staffs.—Station-rd., The Grand Hotel, f. and c.	18,000

By DEBENHAM, TEWSON, & Co.

Walton-on-Thames, Surrey.—Oatlands Park, The Castle Estate, 23 a. 0 r. 28 p., f.	11,000

By ARTHUR BARTON.

Lee.—11 and 12, Bromley-rd., u.t. 63 yrs., g.r. 16*l.*	700
142, Burnt Ash Hill, u.t. 63 yrs., g.r. 15*l.*	700

By C. W. DAVIES & SON.

Stoke Newington.—34, 36, and 56, Gordon-rd., u.t. 58 yrs., g.r. 18*l.* 16s., r. 106*l.*	1,100
9, Knebworth-rd., u.t. 63 yrs., g.r. 4*l.* 10s., r. 32*l.*	320
48, Harcombe-rd., u.t. 63 yrs., g.r. 5*l.*, r. 30*l.*	325
Mile End.—33 to 51 (odd), Entick-st., u.t. 48½ yrs., g.r. 25*l.*	1,910
Bethnal Green.—35, Old Ford-rd., u.t. 38 yrs., g.r. 2*l.* 5s., r. 24*l.*	850

By H. DONALDSON & SON.

Dalston.—80, Queen's-rd., u.t. 23 yrs., g.r. 2*l.* 10s.	300
Stoke Newington.—25, Benthal-rd., u.t. 74 yrs., g.r. 8*l.*, e.r. 48*l.*	415
1 and 2, Hope Cottages, with stabling and yard, area 7,000 ft., u.t. 11 yrs., g.r. 6*l.*	230

By J. S. RICHARDSON.

Kentish Town.—7 and 9, Grafton st., u.t. 49 yrs., g.r. 14*l.*, r. 76*l.*	700

By TUCKETT & SON.

Hayes, Middx.—Dawley-rd., the Hamborough Arms p.-h., &c., f.g r. 7*l.*, reversion in 12 yrs.	1,600

By JOSEPH STOWER (at Winchester House).

Battle, Sussex.—Battle Abbey and domain, 6,118 a., f.	200,000

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Clapham Common.—Nightingale-lane, the Nightingale tavern, f., with goodwill	13,725

November 27.—By BALCH & BALCH.

Highgate.—4, St. Albans Villas, u.t. 48 yrs., g.r. 10*l.*	1,000
Camden Town.—54, St. Augustine's-rd., u.t. 49 yrs., g.r. 7*l.*, e.r. 55*l.*	590
Stroud Green.—1, Granville-rd., u.t. 77 yrs., g.r. 10*l.*, r. 55*l.*	610

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Hackney.—16, Bishops-rd., u.t. 44 yrs., g.r. 5*l.*, r. 36*l.* £310

By J. H. BULMER.

Rotherhithe.—1, 3, and 5, Paradise-st., f. 1,090
55, Paradise-st., f. 310
90, Paradise-st. (site of), area 1,900 ft., f. 320
92, 94, 96, and 98, Paradise-st., f. 1,430
Bermondsey.—222, 224, and 226, Alderminster-rd., u.t. 35 yrs., g.r. £15 555
47, Abbey-st., f. 445
17, Yalding-rd., u.t. 32½ yrs., g.r. 4*l.* 7s. 6d. 255
127, Jamaica-rd., u.t. 36¼ yrs., g.r. 6*l.*, r. 40*l.* .. 455
6, Lockwood-rd., u.t 44½ yrs., g.r. 3*l.* 10s., r. 30*l.* 390
Horselydown.—20, Gainsford-st., and 9A, Curlew-st., u.t. 49 yrs., g.r. 5*l.* 530
6, 7, 8, and 9, Curlew-st., u.t. 23 yrs., g.r. 28*l.*, r. 110*l.* 530
Rotherhithe.—424 to 430 (even), Southwark Park-rd., u.t. 47¾ yrs., g.r. 12*l.*, r. 134*l.* 8s. 1,090
20 to 23, Manor-lane, and 7, Suffolk-st., u.t. 48¾ yrs., g.r. 6*l.* 15s. 755
8, 10, and 12, Suffolk-st., u.t. 48¾ yrs., g.r. 3*l.* .. 590
Peckham.—22 and 24, Choumert-grove, u.t. 55 yrs., g.r. 6*l.* 530
Bermondsey.—37, Drummond-rd., u.t. 32 yrs., g.r. 3*l.* 235

By HERRING, SON, & DAW.

Penge.—76, Beckenham-rd., f., r. 36*l.* 650
St. George's East.—5, 6, and 7, Marmaduke-pl., f. 635

By MULLETT, BOOKER, & Co.

Portman-square.—90, Gloucester-pl., and 90, Gloucester-mews West, u.t. 11¼ yrs., g r. 145*l.* 260

By ALFRED RICHARDS.

Finsbury.—1 and 3, Clifton-st., u.t. 7 yrs., g.r. 18*l.*, r. 80*l.* 150
Tottenham.—182 and 182A, Northumberland Pk., u.t. 49 yrs., g.r. 9*l.*, r. 48*l.* 425

By R. TIDEY & SON.

Caledonian-rd.—31, Wynford-rd., f, r. 30*l.* 440
Caledonian-rd.—Nos. 192 to 200 (even), u.t. 42 yrs., g.r. 30*l.*, r. 312*l.* 10s. 3,400
De Beauvoir Town.—53, Southgate-rd., u.t. 69½ yrs., g.r. 11*l.*, e.r. 55*l.* 450

By VENTON, BULL, & COOPER.

Shaftesbury-avenue.—Rupert-st., f.g r. 360*l.*, reversion in 75½ yrs. 11,000
Lee.—Grove Park, Whitcliffe and 1 a., f. 2,100
Camberwell.—61, Camberwell-rd., u.t. 70 yrs., g r. 30*l.*, r. 65*l.*, including underlease for 19 yrs. and goodwill 750

By DOUGLAS YOUNG & Co.

Hackney.—40, Dunlace-rd., u.t. 56 yrs., g.r. 5*l.* 5s., r. 30*l.* 340
29, Dunlace-rd., u.t 66 yrs., g.r. 5*l.* 10s., r. 28*l.* 350
Bermondsey.—190 to 196 (even), Long-lane, with workshops in rear, f. 2,360

By WYATT & SON (at Chichester).

Felpham, Sussex.—Vicarage-lane, four freehold cottages 660

By A. BURTENSHAW & SON (at Hailsham).

Hurstmonceux, Sussex.—Gardner-st., the Brewer's Arms b.-h., f., r. 30*l.* 1,000

By W. BROWN & Co. (at Berkhamstead).

Berkhamsted, Herts.—The Royal Oak b.-h., f., r. 20*l.* 750
Northchurch, Herts.—Enclosures of land, 49 a. 1 r. 20 p., f. 2,250

November 28.—By BAKER & SONS.

Willesden.—Talbot-rd., f.g.r. 8*l.* 8s., reversion in 85 yrs. 195

By BALE & CAPPS.

Notting Hill.—87 to 93 (odd), Portobello-rd., u.t. 92 yrs., g.r. 42*l.* 1s., r. 157*l.* 1,600
Bayswater.—47, Ledbury-rd., u.t. 39 yrs., g.r. 12*l.* 10s., r. 55*l.* 4s. 1,600
Notting Hill.—76, Golborne-rd., u.t. 64½ yrs., g.r. 10*l.*, e r. 60*l.*, including goodwill 610
Cricklewood.—10, Carlton-gdns., u t. 90½ yrs., g.r. 7*l.* 7s., e.r. 60*l.* 600

By BROWETT & TAYLOR.

Barnes.—Castelnau, i.g.r. 20*l.*, u.t. 38 yrs., g.r. 17*l.* 2s. 230

By PERCY H. CLARKE.

Forest Gate.—37, Ernest-rd., u.t. 75 yrs., g.r. 3*l.* 3s. 170

By C. C. & T. MOORE.

Mile End.—5, Stepney-green, c., r. 50*l.* 1,020

By NOTT, CARTWRIGHT, & ETCHES.

Southall.—8, 9, 10 and 11, Spencer-st., u.t. 94 yrs., g.r. 39*l.* 16s. 200

By WM. STEVENS.

Dalston.—235 and 237, Queen's-rd., u.t. 23 yrs., g.r. 8*l.*, r. 76*l.* 520

By STIMSON & SONS.

Walworth.—138 to 144 (even), South-st., u.t. 49½ yrs., g.r. 17*l.* 10s. 1,20
117 to 123 (odd), South-st., u.t. 48½ yrs., g.r. 22*l.* 970
5, 7, 9, 11, 19, 21, 25 and 27, Inville-rd., u.t. 48½ yrs., g.r. 42*l.* 15s. 2,030
83 and 85, Inville-rd., u.t. 49½ yrs., g.r. 9*l.* 10s. 550
6, Inville-rd., u.t. 48½ yrs., g.r. 4*l.* 10s. 320
58 to 68 (even), Inville-rd., u.t. 49½ yrs., g.r. 32*l.* 1,640
1 and 3, Hopwood-st., u t. 48½ yrs., g.r. 9*l.* 530
5 and 7, Hopwood-st., u.t. 48½ yrs., g.r. 26*l.* 10s., r. 234*l.* 1,520
2 to 14 (even), Hopwood-st., u.t. 49 yrs., g.r. 31*l.* 10s. 2,030
Bermondsey.—4, 5 and 6, Alfred-st., u t. 14½ yrs., g.r 9*l.* 12s. 290
70, 72 and 74, Fort-rd., u.t. 12½ yrs., g.r. 15*l.* .. 335
38 to 48 (even), Beatrice-rd., u.t. 37½ yrs., g.r. 30*l.* 1,695
261 and 263, Lynton-rd., u.t. 41½ yrs., g.r. 10*l.* 565
Rotherhithe.—35, Plough-rd., u.t. 49½ yrs., g.r. 6*l.*, r. 35*l.* 320
Peckham.—15 to 21 (odd), Evelina-rd., u.t. 72½ yrs., g.r. 20*l.* 1,080
45, Evelina-rd., u.t. 64½ yrs., g.r. 5*l.* 250
17, Gibbon-rd., u.t. 72½ yrs., g.r. 5*l.* 260

November 29.—By EDWIN EVANS.

Westminster.—29 to 37 (odd), Grosvenor-st., u.t. 8 yrs., g r. 22*l.* 335

By C. GERRATT & Co.

Norwood.—40, South Norwood Hill, u.t. 94 yrs., g.r. 8*l.* 10s., e.r. 48*l.* 450

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 12 0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1 10 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts	1 13 0	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 6 6	,,	,, ,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 4 0	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.	
Thames and Pit Sand	7	3 per yard, delivered.
Thames Ballast	6	0 ,, ,,
Best Portland Cement	32	0 per ton, delivered.
Best Ground Blue Lias Lime	25	6 ,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. dep't.
Bath ,,	1 7	,, ,,
Farleigh Down Bath	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,,	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks	2 10	,, ,,

		s. d.	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)		2 8	per ft. super at rly. depôt
,, ,,	6 in. Rubbed Ditto	3 0	,, ,,
,, ,,	3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,,	3 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks		2	3 per ft. cube. deld. rly. depôt
,, ,, ,,	6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,,	3-in. do.	1	2½ ,, ,,

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	10 15 0	,, ,,
16 × 8 best ,,	6 2 6	,, ,,
20 × 10 best blue Portmadoc	10 18 0	,, ,,
16 × 8 best blue Portmadoc	6 0 0	,, ,,
20 × 10 best Eureka unfading green	11 2 6	,, ,,
16 × 8 ,, ,,	6 15 0	,, ,,
20 × 10 Permanent green	10 0 0	,, ,,
16 × 8 ,, ,,	5 12 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt
Hip and valley tiles	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,

PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 12 in.	0 10 0	more than battens.
⅔ in.	1 0 0	,,

	At per load of 50 ft.	
Fir timber: Best middling Dantzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 18 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (32 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
,, ,, 3 in. by 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, ,, 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 10 0	13 10 0
,, ,, ,, 3 in. by 9 in.	12 0 0	12 10 0
,, ,, battens	9 10 0	10 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
⅔ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 3 0	0 3 6

Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Fitch Plates	8 10 0	9 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

IRON.—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -

[See also page 523.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Monument as Memorial to Her late Majesty	I. of W. Queen Vic. Mem. Comte...	25*l*	Jan. 31

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*800 cube yards of 1¼-inch Quartzite	Beckenham U.D.C.	The Surveyor, Beckenham	Dec. 9
*Workhouse and Infirmary	Parish of Hammersmith	Giles, Gough, & Trollope, 28, Craven-street, Charing Cross, W.C.	do.
School, Somerset-street	Kingston-upon-Hull School Board	B. S. Jacobs, Architect, Bowlalley-lane, Hull	Dec. 10
Filter Bed, &c.	Bradford-on-Avon U.D.C.	S. Howard, Engineer, Town Hall, Bradford-on-Avon	do.
Workhouse Staircases, &c., Knutsford	Bucklow Guardians	R. J. M'Beath, Architect, Birnam House, Sale	do.
Electric Lighting Works, Vickerstown	Barrow School Board	H. T. Fowler, Architect, Ramsden-square, Barrow	do.
Street Works, Gordon-street, &c.	Amble (Northumberland) U.D.C.	Surveyor, Council Offices, Amble	do.
Road Works, Burgoyne-road	Croydon Town Council	E. Mawdesley, Town Hall, Croydon	do.
Alterations, &c., to Chapel, Downham Market		Rev. J. Needham, Bexwell-road, Downham Market	do.
Water Main, &c., Hollingdean-road	Brighton Town Council	F. J. Tillstone, Town Hall, Brighton	do.
Cast-iron Pipes (750 tons)	Brighton Corporation	do.	do.
Sewers	Southall Norwood (Middx.) U.D.C.	R. Brown, Civil Engineer, Public Offices, Southall	do.
*Making-up Street	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	do.
Surveyor's Materials	Dublin Port and Docks Board	N. Proud, Docks Office, Westmoreland-street, Dublin	Dec. 11
Bricks, Lime, &c.	Dover Harbour Board	W. Mowll, 36, Castle-street, Dover	do.
*Making-up and Paving Road	Fulham Council	Borough Surveyor, Town Hall, Fulham	do.
*Road-Making and Paving Works	Ware U.D.C.	J. Elliott Smales, New Road, Ware	Dec. 12
*Alterations, &c., to Infirmary Kitchen	Wandsworth & Clapham Guardians	C. A. Sharp, Architect, 11, Old Queen-street, S.W.	do.
Chapel, &c., Threlkeld, Penrith		J. F. Curwen, Architect, Highgate, Kendal	do.
Six Almshouses, Almondbury, Huddersfield		J. Kirk & Sons, Architects, Huddersfield	do.
Paving Setts, Shipquay-place	Londonderry Corporation	City Surveyor, Guildhall, Londonderry	do.
Cast-iron Mains, Margate	Isle of Thanet Gas Company	J. Dougall, Engineer, The Dane, Margate	do.
Street Works	Ware (Herts) U.D.C.	J. E. Smales, Surveyor, New-road, Ware	do.
Cast-iron Pipes, &c.	Birmingham Corporation	E. A. Lees, 44, Broad-street, Birmingham	do.
*Stores and Materials for 12 months	Nottingham Corporation	City Engineer, Nottingham	do.
Farm Buildings, Dearnley	Rochdale Guardians	T. Townend, jun., Architect, Fleece-street, Rochdale	Dec. 13
Paving Deepdale-road and Dove-street, Preston		Borough Surveyor, Town Hall, Preston, Lancs	do.
Sewers, &c.	Devonport Corporation	J. Diggle, Civil Engineer, Heywood, Lancs	do.
Stoneware Conduits	Maidenhead Town Council	Burstall & Monkhouse, Engineers, 14, Old Queen-street, S.W.	do.
Electricity Station, Dunnikier-road	Kirkcaldy (N.B.) Corporation	W. Williamson, Architect, 220, High-street, Kirkcaldy	Dec. 14
Engineering Shop, Dockside, Goole		F. Chambers, Architect, Goole	do.
Road Stone, Newcastle-on-Tyne	Northumberland County Council	County Surveyor, Moot Hall, Newcastle	do.
Waterworks	Longtown R.D.C.	J. Little, Civil Engineer, Viaduct Chambers, Carlisle	do.
Pile and Timber Quay	Poole Harbour Commissioners	H. F. J. Barnes, Architect, Towngate-street, Poole	do.
House, Ulting, Essex	Mr. H. N. Falkner	P. M. Beaumont, Civil Engineer, Maldon	do.
Stores Buildings	Blackpool Corporation	Borough Surveyor, Town Hall, Blackpool	do.
Farm Buildings, Cavenham Hall, Suffolk	Mr. A. B. H. Godschmidt	P. M. Beaumont, Civil Engineer, Maldon	do.
Three Houses, Churston Ferrers, Devon	Mr. T. B. Bolitho	W. F. Tollit, Architect, Totnes	do.
*Erection of Show Yard, Leeds	Yorks Agricultural Society	Society's Office, Blake-street, York	Dec. 16
*New Pavilions and Alterations to Infirmary	Hull Royal Infirmary Board	T. Worthington & Son, Architects, 46, Brown-street, Manchester	do.
Additions to Public Baths, Davenport-street	Macclesfield Corporation	Borough Engineer, Town Hall, Macclesfield	do.
Water Supply Works, Gayton	Towcester District Council	J. B. Williams, Moot Hall, Daventry	do.
Sewerage Works, Rectory-road, &c.	Sutton Coldfield Corporation	W. A. H. Clarry, Civil Engineer, Town Hall, Sutton Coldfield	do.
Broken Granite (1,500 tons)	Romford R.D.C.	G. Lapwood, Surveyor, North-street, Romford	do.
Additions to Infirmary Buildings	Hull Infirmary Board	J. Watson, Surveyor, Bowl Alley-lane, Hull	do.
Hospital	Sevenoaks U.D.C.	W. H. Ansell, Architect, 11, Gt. James-street, Bedford-row, W.C.	do.
Street Works, St. Mary's-road	Eastbourne Corporation	R. M. Gloyne, Civil Engineer, Town Hall	do.
Clock Tower, Mallock Memorial, Torquay		J. Donkin, Architect, Bournemouth	do.
Sewers	East Preston Guardians	Taylor & Co., Engineers, 27, Great George-street, S.W.	do.
*Construction of Strong Rooms	Bromley U.D.C.	Council's Surveyor, Bromley, Kent	Dec. 17
*New Public Baths	Sutton (Surrey) U.D.C.	Council's Surveyor, Sutton, Surrey	do.
*Additions, &c., to Ashburton House, Penge		The Secretary, 76 Beckenham-road, Penge	do.
*Heating Apparatus	Algernon-road Congregational Ch.	Secretary, care of Chapel Keeper, 8, Algernon-road, Lewisham	do.
Road Works, Cemetery-road, Hemel Hempstead		W. E. Locke, Borough Surveyor, Hemel Hempstead	Dec. 18
*Isolation Hospital, Great Stanmore	Hendon R.D.C.	J. A. Webb, Surveyor, Great Stanmore	do.
Steel Rails (4,000 tons)	Glasgow Corporation	J. Young, 86, Renfield-street, Glasgow	Dec. 20
*Underground Convenience	Walthamstow U.D.C.	Council's Engineer, Town Hall, Walthamstow	do.
*Corrugated Iron Hospital	Bedwellty U.D.C.		Dec. 21
*Erection of Buildings for Electrical Power Station	Reading Corporation	Borough Engineer, Town Hall, Reading	do.
*New Bridge across River Ash at Littleton	Middlesex County Council	H. T. Wakelam, County Engineer, The Guildhall, Westminster	Dec. 31
Refuse Destructor, Lifford	King's Norton U.D.C.	A. W. Cross, C.E., 23, Valentine-road, King's Heath, Birmingham	Jan. 6
*Laying Second Line of Pipes, Thirlmere Aqueduct	Manchester Corp. Waterworks	G. H. Hill & Sons, 3, Victoria-street, Westminster, S.W.	Jan. 7
Rebuilding Crown Bridge, Griffithstown, Wales	Panteg U.D.C.	D. J. Lougher, Engineer, Pontypool	Jan. 10
Three Houses, Cemetery-road, Porth		Mrs. S. A. Edmunds, Cornwall-road, Williamstown, Rhondda	No date
Alterations to Premises, Ironbridge, Salop	Co-operative Society	A. B. & W. Scott Deakin, Architects, 12A, Pride-hill, Shrewsbury	do.
House, near Wombwell Station, Yorks		J. Robinson, Architect, Wombwell	do.
Eight Houses, Wombwell Main, Yorks		do.	do.
Two Houses, Sutton, Co. Dublin		G. F. Beckett, Architect, 97, St. Stephen's-green, South Dublin	do.
School, Templeborough	Rotherham School Board	G. E. Knight, Architect, College-street, Rotherham	do.
Three Houses, Burgate-street, Canterbury		W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	do.
Church, Shaftesbury-crescent, Derby	Mrs. Francis Ley	E. R. Ridgway, Architect, Long Eaton	do.
Additions to Warehouse, Church Bank, Bradford		H. Hardaker, Architect, Ivegate Chambers, Bradford	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Surveyor	Fulham Council	200*l*	Dec. 10
*Three Clerks of Works	Willesden District Council	4*l.* 4s. per week each	do.
*Superintendent of Outdoor Work	Royal Borough of Kensington	250*l.* &c.	Dec. 16
*Assistant Surveyor	Hanley Corporation	150*l.*	do.
*Senior Sanitary Inspector	Hampstead Council	250*l.* per annum	do.
*Second Assistant in Surveyor's Department	Leyton U.D.C.	100*l.*	Dec. 17
*Junior Building Surveyor	London County Council	2*l.* per week	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, p. iv. *Contracts*, pp. iv. vi. viii. x. & xxi. *Public Appointments*, pp. xviii. xix. & xxi.

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PRICES CURRENT (*Continued*)

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	. . .
,, ,, 22 g. and 24 g.	17 0 0	. . .
,, ,, 26 g.	18 10 0	. . .
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	. . .
,, ,, 22 g. and 24 g.	13 0 0	. . .
,, ,, 26 g.	14 0 0	. . .
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	. . .
,, ,, 22 g. and 24 g.	13 5 0	. . .
,, ,, 26 g.	14 5 0	. . .
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	13 10 0	. . .
Pipe in coils	14 0 0	. . .
Soil Pipe	16 10 0	. . .
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	. . .
Silesian	24 0 0	. . .
COPPER—		
Strong Sheet per lb.	0 1 0½	. . .
Thin ,,	0 1 2	. . .
Copper nails ,,	0 1 2	. . .
BRASS—		
Strong Sheet ,,	0 0 11	. . .
Thin ,,	0 1 1	. . .
TIN—English Ingots ,,	0 1 3	. . .
SOLDER—Plumbers' ,,	0 0 6½	. . .
Tinmen's ,,	0 0 8	. . .
Blowpipe ,,	0 0 9	. . .

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
,, ,, fourths	2¾d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, ,, fourths	3½d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, ,, fourths	4¼d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, ,, fourths	5¼d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, ,, 21 ,,	4¼d. ,, ,,
Hartley's Rolled Plate	2¾d. ,, ,,
,, ,, ,,	3¼d. ,, ,,
,, ,, ,,	3¾d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 10
,, ,, ,, in barrels ,,	0 2 11
,, ,, ,, in drums ,,	0 3 1
Boiled ,, ,, in pipes ,,	0 3 0
,, ,, ,, in barrels ,,	0 3 1
,, ,, ,, in drums ,,	0 3 3
Turpentine, in barrels ,,	0 2 3
,, in drums ,,	0 2 6
Genuine Ground English White Lead ...per ton	21 10 0
Red Lead, Dry ,,	21 10 0
Best Linseed Oil Putty per cwt.	0 8 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	per gallon. £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS

"Estimates."—(If you will send name and address we may be able to consider the subject further). A. E.—J. B. Amounts should have been stated). F. W. P. (Belowour limit.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

DEVONPORT.—For additions to infectious diseases hospital, North Prospect, for the Town Council :—

Matcham & Co.	£1,298 0 0	Paynter	£1,046 12 7
T. May	1,197 0 0	Steer & Pearce	994 12 2
A. N. Coles	1,117 10 0	Ambrose	993 16 3
Pearce Bros.	1,098 5 0	Allen & Tozer*	992 0 10
Blake	1,065 17 9	[All of Plymouth.]	

HOUNSLOW.—For the erection of twenty-two houses, for the Heston and Isleworth Urban District Council. Mr. P. G. Packman, C.E., Town Hall, Hounslow :—

Wallis	£6,620 9 8	Westbrook	£5,373 18 3
Pitt	6,390 0 0	Macklin	5,337 0 0
Soole & Son	6,000 0 0	Hiscock	5,291 0 0
Emmett	5,983 15 0	Christie	4,855 0 0
Lock Bros.	5,829 18 0	Beach & Co., Woodford*	4,575 0 0
Barkers, Ltd.	5,575 0 0		

LONDON.—For constructing three workshops, Cassland House, Cassland-road, N.E., for the Governors of the Hackney Institute. Mr. A. W. S. Cross, architect, 58, Conduit-street, Regent-street, W. Quantities by Mr. A. G. Cross, 6, Old Queen-street, Westminster :—

S. Kind	£2,939 0 0	Voller & Goodfellow	£2,292 0 0
Cordell & Sons	2,662 6 0	J. S. Robey	2,289 0 0
Gray Hill	2,546 0 0	Dolman & Co.	2,277 0 0
Castle Bros.	2,519 0 0	J. Jerram	2,263 0 0
J. Christie	2,493 0 0	Killby & Gayford	2,259 0 0
Roome & Co.	2,449 0 0	Smith & Co.	2,249 10 6
Geo. Barker	2,433 0 0	Gibb & Co.	2,239 0 0
Perry Bros.	2,397 0 0	W. Shurmur	2,196 0 0
General Builders	2,397 0 0	Foster Bros.	2,192 0 0
T. E. Mitchell	2,395 0 0	Viney & Stone	2,147 0 0
Chessum & Sons	2,386 0 0	W. Pearce	2,082 0 0
Wilson Bros. & Lamplough	2,379 0 0	Pollard & Brand, 32, Summerhill-road, South Tottenham*	2,040 0 0
G. Parker	2,360 0 0		
Sabey & Sons	2,315 0 0		

LONDON.—For the erection of four workshops in the rear of Nos. 35 to 41, Clark-street and Nos. 118 to 122, Rutland-street, Mile End, E., for Mr. Charles Martin. Mr. Ernest H. Abbott, architect, 6, Warwick-court, Gray's Inn, W.C. :—

Henry Hood	£998	A. E. Symes	£850
R. & E. Evans	925	George Wales	837

LONDON.—For the erection of two workshops in the rear of Nos. 50 and 52, Lindley-street, Mile End, E., for Mr. H. Anschel. Mr. Ernest H. Abbott, architect, 6, Warwick-court, Gray's Inn, W.C. :—

J. F. Holliday	£395	Cone & Smith	£310
J. Gibbs, jun.	308		

LONDON.—For the erection of seven workshops in the rear of Nos. 24 to 32, Philpot-street, Mile End, E., for Mr. C. D. Taylor. Mr. E. H. Abbott, architect, Warwick-court, WC. :—

R. & E. Evans	£1,758	George Brown	£1,398
Henry Hood	1,449		

LONDON.—For the erection of an iron mission church, New Cross, S.E. :—

Smith & Co., Stratford* £204

LOSSIEMOUTH (N.B.).—For alterations and additions to the Stotfield Hotel. Mr. R. B. Pratt, architect, Town and County Buildings, Elgin :—

Masonry.—Cruickshank, Aberlour ....
Carpentry.—Ritchie & Son, Lossiemouth ....
Plumbing.—Ross Bros., Elgin ....
Slating.—G. Murray, Lossiemouth .... } £2,374
Plastering.—E. Gray, Elgin ....
Painting.—McGilleray, Lossiemouth ..
Ironwork.—Anderson & Youie, Elgin ..
Grates and Mantels.—Bannochie & Son, Aberdeen ....

MIDDLETON (Lancs).—For paving, &c., Highfield-street and others, for the Corporation. Mr. W. Welburn, Borough Surveyor, Town Hall, Middleton. Quantities by Borough Surveyor :—

J. Dalty	£2,382 14 5	A. Williamson	£1,755 11 6
T. Roland	2,165 15 0	R. Heard	1,710 8 4
Etheridge & Clarke	2,054 17 7	Cordwall, Wilson, & Lunt.	1,700 14 4
French & Clough	1,962 7 0	Partington & Son, Middleton*	1,663 15 4
Snape & Son	1,960 19 3		

ROMFORD.—For the execution of sewerage and drainage works, Hare-street, for the Urban District Council. Mr. J. Turvey, surveyor, Market-place, Romford. Quantities by surveyor :—

W. & C. French	£2,071 8 6	D. T. Jackson	£1,522 0 0
T. W. Pedreth	2,226 2 6	Johnson & Langley, Brockley*	1,230 8 7
Wilson, Bordder, & Co.	1,760 0 0	W. Manders	1,287 0 0
W. Poel, jun.	1,274 15 4		

[Surveyor's estimate, £1,275.]

RUABON (Wales).—For the erection of a house, &c., Newbridge. Mr. W. H. Johns, architect, Vroncyssyllte, Llangollen. Quantities by Mr. W. J. Gregory, Boothstreet, Manchester :—

Evans & Roberts	£654	John Carden	£545
Evans & Sons	618	R. Hopley	520
Isaac Roberts	595	Jabez Higgins, Oswestry*	487
Price Williams	575		

SOUTHEND-ON-SEA.—For providing and fixing 7,000 ft. lineal Norway kerb, &c., for the Essex County Council. Mr. P. J. Sheldon, C.E., Duke-street, Chelmsford :—

A. & B. Hanson	£1,431 4 0	Bonnett & Co.	£1,386 10 0
Nowell & Co.	1,393 11 10	W. Iles	1,200 0 0
Griffiths & Co.	1,374 19 6	Buxton & Jenner, Southend-on-Sea*	1,197 10 1
Lawrence & Shacker	1,359 13 2		

SUNDRIDGE PARK.—For erecting house for Mr. Sayers, Garden-road, Sundridge Park. Mr. T. Merrison Garrood, architect and surveyor, 172, Fenchurch-street, E.C. :—

P. Duthoit	£1,312	Senerford	£1,110
J. Podger	1,267	Pinnane	1,075
Graty	1,297	L. Evans*	979
Lawe	1,117		

WEST HAM.—For the erection of thirty-six double tenement-houses in Invicta- and Rendel-roads, Canning Town, E., for the Corporation of West Ham. Mr. John G. Morley, Borough Engineer :—

Spencer, Sanito, & Co.	£21,000 0 0	Gregar & Son	£15,930 0 0
Calnan & Son	20,063 0 0	Barker & Co., Ltd.	15,816 0 0
W. Irwin	19,215 18 11	Haines & Co.	14,656 0 0
H. L. Holloway	18,370 0 0	Herbert Bros.	14,247 0 0
Martin, Wells, & Co.	17,999 0 0	G. Wise (Manager, Corporation Works Department)*	13,955 0 0
W. E. Davey	17,275 0 0		
Hardy Bros.	16,565 0 0		
Shelbourne & Co.	16,542 0 0		

[Borough Engineer's estimate, £15,000.]

WOOLWICH.—For the erection of a cottage, Cemetery-road, Plumstead, for the Woolwich Guardians. Messrs. Church & Co., architects, William-street, Woolwich :—

Foster Bros.	£562 0 0	Thomas & Edge, Anglesea-av., Woolwich*	£447 0 0
C. Kitley	533 8 7		
Stevens & Son	498 0 0		
G. G. Page	483 10 0		

LONDON SCHOOL BOARD TENDERS

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's architect :—

The interiors of the following schools will be cleaned between December 14, 1901, and January 4, 1902 :—

ACKMAR-ROAD (all Buildings) :—

W. Hammond	£330 0	Chinchen & Co.	£269 0
J. & M. Patrick	328 0	C. Curd*	220 10
W. Hornett	310 0		

ALDENHAM-STREET :—

T. Cruwys	£235 0 0	Marchant & Hirst	£166 0 0
C. & W. Hunnings	216 17 6	W. Chappell	139 0 0
Stevens Bros.*	175 10 0		

ANN-STREET :—

Stevens Bros.	£223 0	Johnson & Co.	£220 0
W. Chappell*	£158 10 0		

BELLEVILLE-ROAD :—

R. S. Ronald	£270 0	E. B. Tucker	£209 5
Martin, Wells, & Co.	263 0	Lorden & Son	177 15
Johnson & Co., Ltd.	223 0	Garrett & Son	165 0
		E. Flood*	162 0

BUCKINGHAM-TERRACE :—

Brown & Sons	£270 0 0	F. Chidley*	£166 11 6
T. Cruwys	230 0 0	Chinchen & Co.	159 0 0
W. R. & A. Hide	205 0 0	W. Chappell	149 0 0
Bristow & Eatwell	179 10 0		

BUCK'S-ROW :—

J. F. Holliday	£178 0	W. Shurmur	£144 0
J. T. Robey	177 0	G. Barker*	142 10
Haydon & Sons	176 10	Vigor & Co.	142 0
F. & F. J. Wood	150 0		

CARLTON-ROAD :—

Balfour & Co.	£579 5	Stevens Bros.	£378 0
R. S. Buckeridge	425 0	Bristow & Eatwell*	295 10
Wall & Co.	394 0		

CRANBROOK-ROAD :—

Collis Willmott & Son	£368	G. Barker	£291
W. Hornett	337	Corfield & Co.	265
Barrett & Power	323	Silk & Son*	253

CRAWFORD-STREET :—

Holloway Bros.	£368 0	H. Line	£243 0
W. Downs	329 13	Maxwell Bros., Ltd.	237 0
J. F. Ford	304 0	Garrett & Son*	199 0
Rice & Son	263 0		

DEPTFORD PARK :—

W. J. Howie	£285 0 0	S. Musgrove	£176 18 0
W. Banks	245 17 6	H. Groves*	175 0 0
Hayter & Son	230 0 0		

EARL-STREET :—

W. J. Howie	£259 0 0	E. Proctor	£178 0 0
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VOL. LXXXI.—No 3671. DECEMBER 14, 1901.

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A National Monument to British Heroes ..... Designed by Mr. E. B. Lamb, Architect.
Manchester Fire Station Competition: Second Premiated Design ..... By Mr. G. Watson.
Design for a Dining-room; a Corner in the Hall, "Woodcote," Church Stretton; Sketch for the Hall for a House at Buxton ..... Messrs. Barry Parker and Raymond Unwin, Architects.

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Students' Designs at the Royal Academy.

THE annual exhibition of the designs made in competition for the prizes offered by the Royal Academy is an event of considerable interest, for it is from this exhibition mainly that we can learn what is the tendency of Academical teaching in art, and what prospect there is of the arising of any new men of genius to fill ultimately the place of those who are gone.

Something depends, in such a competition, on the choice of subjects made by the Academy for their students to work on. Subjects for treatment in sculpture and painting are in one sense innumerable, but it is not so easy to select a number which will offer a stimulating interest to the student; a difficulty obviously felt at the Ecole des Beaux-Arts as well as at the Academy. "France Giving Algeria Artesian Wells," which the French students had to work on one year, for instance, was hardly a subject calculated to evolve an interesting picture; and the Royal Academy has not always been more happy. This year however, the Council, or whoever selects the subjects, may be congratulated on having been more successful than usual. In architecture, "A Town Hall for One of the New London Borough Councils" is not only an excellent subject in itself, but one which is calculated to interest the students in an actual architectural requirement of the moment. "Boadicea Exhorting her Troops," and "The Expulsion of Adam and Eve from Paradise," are subjects well worn in painting, but not often treated in sculpture. "Saul and the Witch of Endor" offers considerable opportunities for expression and effect to the painter, and "One of the Bridges over the Thames in London" we should have thought an ideal subject for the Turner gold medal, though we must admit that it does not seem to have inspired the competitors very much. For the Creswick prize it is always difficult to define a subject; what is wanted is simply a good landscape, and that is a vague want difficult to define. "Cumulus Clouds over a Fen Country" serves, however, to indicate the main character of a landscape, so as to keep the competitors in a certain path and render comparison easier. But the best stroke in the way of selection of subjects is that for the decorative painting for a public building—"The Maske of Cupid" from the "Faërie Queene" (Book III., canto 12), the wondrous procession which Britomart sees file through the hall, the personifications of vices and passions, and Cupid riding on a lion among them; a subject certainly to stimulate the imagination, and giving every opportunity too for fine and effective colouring. It is not surprising that so suggestive a subject should have brought out a larger and better competition than usual.

In these pages we must take the architecture first, though architecture has never been the most flourishing of the arts at the Academy, partly because a good deal of the best youthful talent goes to compete for the Institute of Architects' prizes. We have some doubt whether the gold medal for architectural design has been rightly awarded. Mr. Hugh Webb's perspective view is probably mainly what has gained him the medal; it is a sensible and well-balanced Renaissance design of thoroughly municipal character; there is some originality in the treatment of the cupola, and the sculpture figures are well put in. The sectional design of the large hall is not very interesting, and the plan is faulty in principle as well as in some of its details. A principal entrance and vestibule should never lead up to the *side* of the principal apartment; there is an anticlimax in such an arrangement; and the cloakrooms are absurd—two small square rooms facing each other, quite inadequate in size and with no lavatories attached. No hall for public gatherings could be satisfactory, or workable at all, with no better provision for the convenience of the audience than this; planning of this kind is merely evading an important practical point. On the other hand, the corridors are well lighted, and the official lavatories well isolated; but we cannot call this a plan to give a medal to, and we fear plan is not considered at the Academy as much as it ought to be on these occasions.

The two next best designs also make the entrance to the large hall at the side, but No. 197 is a fine plan on the ground floor, and the hall and staircase dignified, but all the entering audience are led to one door only, for the door at the end would be practically only an exit. The design is somewhat too busy and pretentious, but it is effective; the treatment of the end cupolas shows French influence. No. 199 is a very clever and original design, and we are almost disposed to think that it merited the medal. In the exterior there is a fine and effective contrast of masses of masonry with sculptural decoration; the low block in front in the centre is perhaps a little too plain and unadorned, but the whole is original; the large hall is effectively designed, and the cloakrooms are far better planned than in the medal design. The other designs are crude attempts which need not occupy us.

The 25*l.* Upper School prize for "A Set of Architectural Designs" (not quite an accurate description, for here, as in other cases, there is only one design shown by several drawings) has been won by Mr. F. Winton Newman with a design for a pulpit to be executed in marble. This is in a style of detail of the latest fashion, somewhat too thin and rigid in line and proportion, but it has the merit of being exceedingly well suited for marble, and the decorative details are well sketched in. No. 209, a design for the same object, has also merit, and No. 208, a design for a riverside warehouse, is good, though perhaps a little weak in character for a warehouse. How are the subjects for this prize chosen? Two competitors have, as we noticed, sent in designs for the same object, the others for objects widely different. It would seem better to have a selected subject; it is difficult to compare things so diverse as a cathedral pulpit and a riverside warehouse; they have no common denominator, so to speak.

The 10*l.* prize in the Lower School has been well merited by Mr. T. G. Davidson for a "Design for a Country House" with a

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very clever and unusual plan, consisting of a centre block chiefly occupied by entrance hall and dining-room, with wings projecting forward on each side in a kind of horn shape, enclosing the forecourt between them. It would perhaps not altogether do to have one of the drawing-room windows looking across the court at the kitchen offices; but nevertheless the plan is a very clever one; the small side windows opening immediately on the kitchen range are a good feature (kitchen ranges are often deficient in lighting), and the planning of the dining-room, with its two doors and its semicircular bays at the opposite ends, is very effective. The treatment of the exterior is quiet and rather deficient in character as compared with the plan.

Although as we think, plan is not generally sufficiently considered in the architectural awards, the Royal Academy has during the last few years recognised the importance of plan in another way, by offering a 10*l.* prize for a plan of a building. There is only one competitor this year (the subject is evidently not an attractive one), Mr. L. U. Grace, who has made a plan of a Casino and Grounds—*i.e.*, a building with dining rooms and a theatre, with a large formal garden laid out around it. The plan would be a very effective one; the entrance especially is finely conceived; but to have the entrance facing north and both the dining-rooms facing full south is a fatal error, notwithstanding the verandah or colonnade in front of the windows. Aspect is an important point in planning, and those dining-rooms would be very hot in summer. Something larger in the way of a drawing-room seems to be required than the small salon opening out of the end of one of the dining-rooms. Though a fine plan in the effective sense, it is not a very practical one, and the question of aspect seems to have been overlooked, as it often is by the Academy architectural students, though we are assured that it is duly brought before them by their instructors.

The silver medal for architectural drawing has been awarded to Mr. Palmer for a very good set of measured drawings of the Trinity House, and the silver medal for perspective drawing (for architects only) to Mr. A. C. Bossom for a drawing of Lord Burlington's villa at Chiswick. He has also submitted a tinted perspective drawing of the front and central vista of the Temple of Theseus, as a study in sciography. The very useful medal for perspective drawing in outline open to painters and sculptors only has this year, we are glad to see, attracted three competitors; it would have been well if there had been more, for that many painters have never properly learned to handle a building in perspective is a point of which one has evidence in almost every picture exhibition. The prize is in this case taken by a lady, Miss Ada Fuller, who we have no doubt will find the knowledge gained in this competition useful to her in future.

There can be no question that the prize work in sculpture composition—the Boadicea subject before referred to—is far away the best of those sent in; it is by Mr. S. N. Babb, who has treated the subject with great dramatic vigour and at the same time entirely with the proper limits of bas-relief sculpture. The relief is in a rather flat monumental manner, perhaps a little influenced by Donatello, though not so obviously so as in the case of No. 176; who, however, has captured nothing of Donatello but his habit of undercutting low relief figures. No. 177 shows sculpturesque feeling, but is hardly sufficiently worked out. In the competition for a sculpture design (or rather sketch) in the round, "The Expulsion of Adam and Eve," it is noticeable that the first and second prizes have gone to almost the only two competitors who have contented themselves with the human element and omitted the expelling angel. That angel has evidently been a great temptation to most of the competitors, and has led them into sensationalism. The author of the first prize group, Mr. Chrisfield, has shown the two figures walking side by side, their heads bowed, with a consentaneous movement which seems to combine the two into one design with a common *motif;* nothing could be simpler, but its simplicity is its success; it is an admirable design, and we should like to see it worked out life size.

The prize for the cartoon of a draped figure has been taken by a lady student, Miss Gregory, whose figure, in a long black cloak the folds of which are carefully studied, seems to fulfil best the title of the subject—"A Mourner;" but there is a great deal of merit also in the classically draped figure by No. 89; the competition as a whole is a good one. Coming now to the highly interesting mural picture competition, there can be no doubt that the best painting is that by Mr. Eastman to which the prize has been awarded; the colour scheme is fine as a whole, and every figure has been carefully studied. Yet we are not sure whether the second prize design, by Mr. W. E. G. Solomon, does not come nearer to the right way of treating the subject, in the very fact that the figures are less highly-finished, less realistic, more abstract. Spenser, it is true, describes his figures very fully; but after all, they are allegorical personages, and in allegory a degree of detail which can be expressed in words without destroying the poetic element is apt to become too realistic when expressed in painting. One or two of the competitors have fallen into this snare completely, and their pictures only suggest a drawing-room masquerade; there is no glamour about them; and Mr. Eastman's design is just on the verge of the same defect. It merits the prize for its fine and conscientious execution, but we do not know whether Mr. Solomon's is not the more poetic type of treatment, and there is a fine tumult of colour in it too. Mr. Eastman has made a good point in composition by representing his Cupid not riding astride of the lion, as the others have done (and we may add, as Spenser obviously intended), but reclined along the animal's back, and with one of his wings forming a sweeping line above the group; this is a fine element of design, and adds very much to the effect and movement of the whole composition. Among the best of the other designs are those numbered 96 and 99.

The competitors for the "Design in Monochrome for a Figure Picture" (subject, "The Sacrifice of Manoah") are as usual very numerous, and the greater number of them pretty equal in merit and not very remarkable in conception. The one to which the prize has been awarded was not one of the most striking at first sight, but it is certainly the best composed in the relations of the angel and the two other figures; and composition is the main object of this competition. The Historical Painting competition seems (as usual) to support the view that painting of this class is the most difficult of all the arts; it is rarely that, in the students' competition in this class of work, we come upon any work which can be regarded as a satisfactory picture in itself; it is only the best out of so many attempts. Mr. Murray's picture is exceedingly stagey and melodramatic in colour and treatment, but his witch is good; Mr. Appleyard gets a *proxime accessit* for a painting in which he has represented the witch under the exceedingly improbable semblance of a young and nearly nude woman, whose figure shows good treatment, but the picture as a conception of the scene in the Old Testament is absurd. Mr. Osmond Pittman may be congratulated on having obtained both the landscape prizes, the Turner and the Creswick, and both we think deservedly—certainly at all events as regards the Turner medal. He has selected Putney Bridge as his subject, choosing low water for the sake of the shore and the craft lying on it; as a whole it is a very good landscape, though the bridge is sadly maltreated; of course in a landscape one does not expect a bridge to be architecturally made out, but something more of its real character might be given than Mr. Pittman has given, and of its real colour too, for it is a bridge which, on every occasion that we have seen, always looks *white* in the scene, not the colour it is shown here. In the Creswick competition Mr. Pittman's is unquestionably the most finished work, but it does not exactly meet the terms of the subject, "Cumulus Clouds over a Fen Country"; it is not a fen country. The picture numbered 25 has more power of pictorial effect and is more in keeping with the terms of the competition, but it must be admitted that it is somewhat crude in execution. In neither the Turner nor the Creswick competition was the general average of work good; and it seldom is.

The address which was delivered by the President at the distribution of the prizes was full of wise and thoughtful criticism, especially directed against the present craze for originality (or what is thought to be such) at all costs. Sir E. Poynter specially warned the students against the idea that originality could be produced by throwing aside all the best traditions of art. To adopt the pattern of design or colour or the startling methods of execution of some eccentric painter in vogue, showed no whit more originality than to follow in the steps of the great men of the past. "Such aping of eccentricity might be good for the comic journals, but for serious art never. . . . . Let them get at the heart of their theme, and they would find that they had been original without knowing it:" a sentence which we are glad to see was received with much applause. We earnestly hope the art-students of the Royal Academy will act upon this teaching.

NOTES.

Contracts with the Government.

The case of the Attorney-General *v.* Steward & Co., which reached the last stage of litigation in the House of Lords last week, makes one despair of business men, for on the one side was the Admiralty, on the other a limited company, the owners of the Portland quarries, two contracting

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parties who, one would have supposed, would have been able to make arrangements in plain language. The Admiralty sent out tenders for stone in such quantities and at such times as may be required by the Admiralty. The company tendered to supply the stone—approximate amount "about two million tons"—and the Admiralty accepted the tender for the supply "of about two million tons or such quantity as may be required." Before the two million tons was taken the Admiralty gave notice that they needed no more, having given up the work to a contractor. The Court below the House of Lords gave judgment for Steward & Co.; the latter tribunal have reversed these findings, and have held that the contract was not for a specific quantity. The truth is that no two men will construe loose language of the kind alike; each will look at it differently. But the whole of this expensive litigation would have been avoided had the contracting parties said in clear terms what the contract was. No doubt the Admiralty officials merely meant that two millions was the limit required, not necessarily the amount to be taken. Steward & Co. equally genuinely imagined that they had made a contract to supply a definite amount of material. To the ordinary mind it must be confessed the contractors' view seems the most reasonable, but the moral of the affair is that parties to such a contract as this ought to have made their meaning clear in the first instance, and it says little for the business capacity either of the Admiralty or the contractors that they did not put the terms of the contract into less ambiguous language.

Electrical Traction, Underground Railway.

THE arbitrator's award in the dispute between the Metropolitan and the Metropolitan District railway companies, in regard to the system to be employed for electrical traction, has been given in favour of the "continuous" or "direct" current system advocated by the Metropolitan District Company. We regret the decision, as it will probably delay the application of electrical power to working long-distance railways. As Professor Ewing pointed out, the cost of the copper required by the direct-current system to work a long-distance railway would be absolutely prohibitive. The Ganz scheme for working the Underground Railway was a most attractive one. Circle trains, composed of six cars, the first and last of which were motor-cars, were to give a two and a half minutes' service on the circle, and other trains were to change steam for electric motor-cars outside the circle. The primary motors were to take current at 3,000 volts from two overhead trolley wires on the three-phase system, the rails forming the third conductor. The safety devices that were described by the able engineers of the Ganz Company were excellently designed, and so far as safety from shock is concerned, the advantage, in our opinion, lay with the polyphase system. The motors were to be used as brakes, as they are in the Valtellina line in Italy, where 30 per cent. of the energy expended in braking is recovered, as the motors act as dynamos during the process. By the ingenious method of working the polyphase motors "in cascade" various speeds could be obtained without the use of the complicated "series-parallel" controller which is necessary with direct currents. The speed at which the trains would run would enable them to get round the circle in fifty minutes, the maximum speed being twenty-five miles an hour. The weak point in the direct-current system is the necessity of using polyphase currents at the start, and then transforming down by means of rotary converters, introducing an immediate loss of 8 per cent. of the power generated. No one questions that the Underground Railway can be worked by direct currents, but if this system is adopted we shall be surprised if the question of the electrolytic corrosion of gas and water pipes does not demand attention in the immediate future.

The New York Subway.

COMMENDABLE progress continues to be made towards the completion of the New York Rapid-Transit Subway. This important and difficult work was commenced about February, 1900, and the contract stipulates that it must be finished in August, 1904. Amongst the incidental difficulties of construction there are some of particularly troublesome character. Starting at the busiest centre of traffic in the city, the subway runs for no inconsiderable part of its twenty-mile course beneath many important thoroughfares, in close proximity to the surface. As an essential feature is that street traffic may not be interrupted, it was necessary, before starting the work of actual excavation, to construct a complex system of falsework for supporting the roadways and electric tram-lines, as well as to provide suitably for the network of gas, water, electric, and other conduits. Bearing these things in mind, it would be by no means surprising if the present state of work were to foreshadow a deferred date for completion. To find, on the contrary, that the contractors are several months ahead of their time is as satisfactory as it is unusual. The quantity of earth excavated amounts to 800,000 cubic yards out of the estimated total of 1,700,000 cubic yards; 366,000 cubic yards of rock have been removed out of the total of 1,300,000 cubic yards; and 9,700,000 dols. out of 35,000,000 dols. total had been expended up to November 1 of this year. A site for the power house has already been selected of sufficient area to provide, not only for the extensive plant at present ordered, but for considerable additions that may be required for future development of the subway system. Even at the start the power station will be larger than the 70,000 h.p. plant of the Metropolitan Street Railway, and even larger than the 100,000 h.p. power station of the Manhattan Elevated Railway. Contracts have recently been settled for the boilers, engines, and electric generators, and it is anticipated that the whole undertaking will be in operation in the early months of the year 1904.

Bridge Painting.

VISITORS to Scotland frequently notice the difference of tint between one part and another of the Forth Bridge, but only those who take the trouble to inquire into the matter know the exact cause of the phenomenon. The fact is that since its completion the bridge has been continually in the hands of the painters, who commenced work at the southern end, and on finally reaching the northern extremity, at the expiration of about three years, once more resumed operations at the original starting point with the same goal in view. Three such laborious and snail-like journeys have been performed, and the fourth is at present in progress. The Resident Engineer has instituted a complete system of ladders, cradles, and platforms for the painters to work from, motive power being provided by a number of steam hoists and winches. Ladders are attached to the larger struts and ties, and permanent elevators are installed for furnishing access to the loftier parts of the structure. The under side of the roadway is reached from platforms suspended on wire cables stretched at each side of the bridge, and the platforms are drawn along the wires from point to point. Paint is mixed in houses built near the elevators, so that it may be distributed conveniently for use. The satisfactory manner in which the work has been performed is evidenced by the fact that not the slightest sign of deterioration has yet been discovered. Under the present system every detail of the structure is bound to be painted, whether it appears to want it or not. Thus, there is no risk that any out-of-the-way parts can be forgotten, as would certainly be the case if a piecemeal system of work were adopted. There is a weird contrast between modern and ancient bridges. The most magnificent of modern steel structures, the Forth Bridge can only endure by the aid of paint. Stone bridges last for ages without such adventitious aids, as, for example, the bridge built by Trajan at Alcantara, 650 ft. long and 140 ft. above the river, which still survives after braving the elements for 1,800 years.

The New Delaware Breakwater.

A GREAT engineering achievement is the new breakwater in Delaware Bay, now on the point of completion. This important undertaking affords material for a most striking comparison between old and new methods of construction. The old breakwater, about one mile in length, occupied seventy years in building, and contains about 1,231,587 tons of stone, of which the greatest quantity deposited in any one year was 32,000 tons. Its total cost was 2,807,000 dols., and the accommodation was limited to a comparatively small and shallow harbour, now used by nothing larger than coasting and fishing vessels. The new breakwater, one mile and a half long, was designed in 1892, and has already been practically finished. It contains 1,464,410 tons of stone, laid at the average rate of 32,000 tons per month, the maximum monthly rate being 62,719 tons, and the maximum yearly rate 450,000 tons. Its total cost will not exceed about 2,239,334 dols., and the area of the harbour is 789 acres, of which 552 acres have a minimum low-water depth of 30 ft., and 237 acres a similar depth of 24 ft. In point of time the saving has been very remarkable, especially if we assume that methods of work on the older structure were periodically improved: in material the saving has been nearly 400,000 tons at the original rate per mile, and much more if we take into account the greater depth of the new structure; whilst from a financial point of view the saving is no less than 1,971,166 dols. The reduction of time and cost is due to the employment of powerful machinery both at the quarries and the breakwater, and also to the improved method of construction which has so largely reduced the amount of stone

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required. The method in question consists in adopting for the submerged portion of the breakwater a cross-section determined by the action of the sea itself, instead of a much flatter slope, such as was previously believed to be essential. Whilst giving every credit to the engineer responsible for using this form of design, we do not quite concur with the American Press as to its novelty, for the principle is well known to our own marine engineers, who have for many years recognised the desirability of designing their structures in harmony with the working of waves and tides.

The Profitable Sale of Electricity.

WE hope that the lengthy paper read on Thursday by Mr. Arthur Wright (the Electrical Engineer to the Brighton Corporation) to the Institution of Electrical Engineers will enable electricians to fix upon some standard system of charging consumers for electric light. The prevalence of hazy ideas on the subject is shown by the great diversity of systems in use. Some companies begin by having as many as seven or eight bases for making out their consumers' accounts, which entails great clerical labour, and soon leads to general dissatisfaction. Others, as Mr. Wright says, discourage the use of lamps, and thereby the employment of their own capital, during the time most people require light, by quoting a high evening rate and a low day rate. The cost of supplying electrical energy divides itself into two classes—the cost of getting ready to supply energy, and the cost of continuing to supply energy. Methods of separating the two costs were given, and stress was laid on the importance of only considering the annual costs. In Mr. Wright's opinion, the reason why the present electricity consumers are not so profitable in proportion as ordinary gas consumers is due to the imperfect systems of tariff in vogue, to the practice of only running distributing mains in wealthy neighbourhoods, and to the great initial cost of wiring. He points out that supplying the middle-class districts is the most profitable, as the number of users is so much greater per square mile. The tariff he favours is the maximum demand system in use at Brighton, and it certainly seems to us to be the most equitable one. The opposition to a high initial rate only comes from the unprofitable consumer.

Baker-street Station.

THE Metropolitan Railway are taking in hand the enlargement of Baker-street Station none too soon. For it is intended to apply to Parliament in the approaching Session for powers by Bill to take the necessary property. It has long been little short of a scandal that a terminal station should have no vehicular outlet but the open street, and that passers-by and passing traffic should be inconvenienced by the railway traffic. The enlargement of the terminal station will, it is to be hoped, improve the circle station, which is altogether too small for its traffic. We are glad to note a considerable improvement in the lighting of some of the stations on the District line, and we are confident that lighter stations would attract traffic, for no one, if he can possibly avoid it, will descend into dark and positively dangerous underground stations.

The Church of St. Bartholomew, Little Moorfields.

THE Ecclesiastical Commissioners announce that the freehold site and the fabric of the church will shortly be offered for sale at the Auction Mart. The site has frontages to Tenter-street, Moor-lane, and New Union-street, and extends over an area of about 6,300 superficial feet. The benefice is now united with that of St. Giles, Cripplegate Without, and a new church to be dedicated to St. Bartholomew will be erected with the proceeds of the sale. On October 5 last we gave an account of the reinstatement in St. Giles's Church of some of the interior fittings at St. Bartholomew's, which was built by Professor Cockerell, who used much of the materials—comprising the tower, with its singular top-stage—and fittings of Wren's church of St. Bartholomew-by-the-Exchange, pulled down in 1840 for a widening of Threadneedle-street at the building of Tite's Royal Exchange.

Mr. Weedon's Landscapes.

THE Fine Art Society has on view a collection of water-colour drawings by Mr. A. W. Weedon, of more than average excellence. Mr. Weedon is one of the water-colour artists of the old broad school of handling, and in his best work there is much affinity between his style and that of the late Mr. Wimperis; see "Waste Ground near Lymington" (16), for instance, with its grand clouds floating over a barren moor. Among others of the same type of excellence are "Fittleworth Common" (9), an exceptionally fine little landscape both in composition and in the treatment of the sky; "On the Dunes, Holland" (3); "Coast Road, Bosham Creek" (13); "Peat-bog, Poolewe" (50); and "The Borders of the New Forest" (62). The largest work, which fills the centre space at the end of the room, is "Launching the Boat" (35)—an expanse of flat shore and a great space of windy sky; the boat and figures surrounding it form an incident concentrated at one point in the scene, so as to produce what may be called a strong accent in a scene where all else is sky and shore, in a very fine and effective manner. Other types of subject are well treated; "Richmond Park" (34) is a fine tree picture; there is a fine view of Salisbury (48) from the same point as Turner's "Liber Studiorum" sketch, with the same long low hill in the background; and "Martello Towers near Eastbourne" (55), a work unlike the others, is a beautiful bit of bright sunshine effect. The whole collection is the work of a conscientious and genuine water-colour artist.

Decorative Paintings for a Church.

THE pictures of Mr. Frederick Shields, now on view at Messrs. Dowdeswell's gallery, painted for the chapel of the Ascension in Hyde Park-place, can only be strictly called decorative in regard to the four single figures of Faith, Hope, Love, and Patience; the larger subjects, in regard to style, are easel pictures, though intended no doubt, in a sense, to constitute church decoration. We cannot say that they are very striking either in conception or colour (so far as the latter quality can be judged of in the artificial light under which they are exhibited); that representing "The Cleansing of the Temple" is very weak, the figure of Christ being totally without energy of expression or action. In "The Lesson of Forgiveness" there are higher qualities of expression. The four single figures are treated symbolically, and combined with symbolical attributes; these require a certain degree of explanation in the catalogue, which is a weakness in a work of art; the only symbolism fit for painting is that of which the meaning is obvious without literary explanation. The finest and most effective of these figures is "Faith"; but the whole give rather the impression of being painted for their moral significance than for artistic impressiveness. It may be argued that this is the right aim for church paintings, and we do not say that it is not so; only works painted in this spirit must be estimated from the religious and not from the artistic point of view.

The Date of Stonehenge.

MR. F. C. PENROSE and Sir J. Norman Lockyer have been engaged during the past summer in taking observations at Stonehenge, more particularly with the object of ascertaining the date of the erection of the stones, and of investigating the actual or supposed orientation of the remains. We gather that in the result they are inclined to consider that the stones were set up about seventeen hundred years before the Christian era, upon the prior assumption that the structure constituted a solar temple.

MAGAZINES AND REVIEWS.

THE *Architectural Record* contains a very interesting and significant article by Mr. Montgomery Schuyler on "Monumental Engineering." The article is partly suggested by the results of a recent competition for a bridge across the Potomac from Washington to Arlington. It constitutes an exceedingly thoughtful criticism on the æsthetic treatment of bridges. The "accepted design," by Mr. Burr (engineer) and Mr. Casey (architect), is somewhat like the Vauxhall Bridge, in so far as the actual construction is a steel-braced one, and the facing a masonry arch with rusticated voussoirs—of better proportions, however, than the Vauxhall design. The competition, says the writer of the article, should have value in bringing about an increasing attention to the appearance of bridges, and in forcing engineers to consider the artistic element in design. "This competition shows us that eminent engineers may be entirely helpless when the element of design is introduced. It is not beyond hope that the looks of municipal bridges may come to be regarded as of as much importance as the looks of other municipal erections, and even that railways will come to consider the appearance of their bridges as well as of their stations. For these works the engineers cannot resort to the architects, but must rely on themselves. When this happy state of things comes about, the question of the artistic training of engineers will settle itself by resolving itself into a question of supply and demand. And then it will be no longer possible for a professed vandal to remain an eminent engineer." It is gratifying thus to find that the movement which is taking place in England in favour of the artistic designing of bridges has its counterpart on the other side of the Atlantic.

The *Berliner Architekturwelt* contains an article on "The Berlin High-level Bridge from an artistic point of view" ("als Kunstwerk"), but the illustrations given show more of eccentricity than art. The new building for the Berlin Handselgesellschaft, by Herr Alfred Messel, is a fine and dignified piece of architecture of the Classic school, with some touches of originality.

In the *Art Journal* Mr. Claude Phillips continues his critical essay on the contents of the Wallace collection, dealing in this number chiefly with the works of Fragonard and Greuze. A short article on the Castle of Neuschwanstein, by Mrs. James Douglas, with illustrations by her husband, introduces us to

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a Bavarian castle of singularly romantic beauty of design and position. Under the title "An Artist in Floral Design," Mr. Lewis F. Day introduces us to the work of Mr. Lindsay P. Butterfield, whose designs for tapestry and cretonne, illustrated here, are excellent examples of the application of foliage forms to conventional design.

The *Magazine of Art* contains an article on the later work and studies of Adolf von Menzel, who appears to have taken largely to pencil work in his latter days. Miss Helen Zimmern contributes a short article on the "Trend of Modern Italian Art," which, from her account, appears to be rather largely influenced by northern art, not excepting what is called the "Glasgow School"—not, apparently, with very happy results. An imaginary conversation on "Impressionism: Con. and Pro," is worth reading; and there is an article on the work of "A German Artist in Metal," Herr Albert Reimann, the illustrations of whose work show a great deal of piquant fancy and invention.

The *Artist* includes an article on "The Influence of the Pre-Raphaelites in France"—an influence which we should imagine to be purely imaginary; one on "Auguste Rodin," in the usual spirit of adulation which is fashionable at present; and one on "Two Bohemian Painters," F. Jennewein and E. Holarek. These painters, judging by the illustrations of their works that are given, are possessed of no little power, though they illustrate the present-day tendency to the worship of ugliness and morbidity in art. What is the meaning or charm of the two ridiculous little chromo-lithographs of houses at Samer (near Boulogne) we fail to comprehend.

Under "The Field of Art" Mr. Russell Sturgis contributes to *Scribner* an article on "Art Societies and Societies of Artists," and the special good they may do or should aim at doing. An article on American portraiture of children, by Mr. Harrison S. Morris, shows in its illustrations some very charming examples of the treatment of children in art. "A Miniature," by Margaret Kendall, showing a little child in his shirt wading in a stream, with a hedge as a background, is something quite original, and there are other very good examples among the illustrations.

The *Century* has an article by Mr. C. Dexter Allen on "The Appeal of the Book-Plate, Antiquarian and Artistic." The illustrations are of course all from American book-plates, of which the best are two by Mr. E. D. French, who appears to be considered the leading American designer in this class of work. That of the New York Yacht Club Library shows a decorative treatment of the stern of a seventeenth-century ship, with decorative water and the name of the club on a panel; the mistake of the design is that you see an anchor and a distant view of the sea through the centre stern window, so that the ship is reduced to a skeleton frame, though a mast and sail are seen above this vacuum. A certain probability should pervade even conventional decorative design. The other we refer to is that of the Grolier Club. In the same artist's design for the Union League Club the decorative detail is admirable, but the perspective view of the interior of the club in the centre of the plate seems out of place. A book-plate should be symbolical, not realistic. The author of the article notes that originally all book-plates were heraldic, and that "the question of the use of the family coat of arms vexes the American very seriously;" not however, as we should have expected, because Republican America despises such vanities (at least it is not so stated), but because of the difficulty of acquiring certainty about the "right to arms," or of getting the "coat" well drawn when this initial difficulty has been got over. "Heraldry is too exact a science to admit of liberties, and it is no small achievement to draw the coat of arms with absolute correctness, and yet with artistic feeling." This is quite true, but one is surprised to read the sentence in an American magazine. The same issue contains some rather striking and effective chromo-lithograph illustrations to Milton's "L'Allegro," by Mr. Maxfield Parrish.

Harper contains an important article by Dr. Waldstein, "New Light on the Parthenon Sculptures." This seems to be substantially the paper which he read before the Hellenic Society last year, in which he drew attention to the photographs of two statues purchased almost accidentally in Rome in 1892 (they are said to have been merely "thrown in" along with other articles supposed to be more important), and now in the Dresden Sculpture Museum, one of which is so like the general attitude of the Parthenon Kephissos figure, as as to leave no doubt of its having been a copy of it. The other is a complete half-draped female figure, which corresponds in many of its lines with draped female figures at the Parthenon of which only portions remain, and which Dr. Waldstein therefore takes, with great probability, as being a copy of a figure by Phidias of which we have lost the complete original. The same number contains a most interesting article on Rosa Bonheur, by M. Jules Claretie, and one on Snow Crystals, by Mr. Wilson Bentley, accompanied by illustrations of forms of the most beautiful and elaborate symmetry from actual snow crystals, suggesting a new field for the student of decoration.

The *Pall Mall Magazine* contains an article on "London Bridge" as it is and as it will be, by Mr. Hugh B. Philpott, with illustrations by Mr. Hedley Fitton. The author has the sense to perceive that we may be paying too high a price for any convenience which the widening of the bridge may bring us: "the 100,000*l.* is a trifle to the city of London; but we have to pay a heavier price in the permanent disfigurement of one of the few great monumental structures our city possesses." That is what many other people will probably discover—after the mischief is done.

The *Engineering Magazine* contains an article by Mr. A. Lazenby on "Advanced Methods in a British Engineering Workshop," the "workshop" being the Victoria works of Messrs. Willans & Robinson. Among the advanced methods it is mentioned that the firm have for a long time been in the habit of standardising their principal productions, and making all corresponding parts of the same size interchangeable. In order to ensure this, the different parts are invariably made in quantities, and an elaborate system of gauges and templates is maintained and a special department forming part of the machine shop is set aside for their manufacture and storage. The following statement as to the relations of the firm with their employees is of interest at the present moment:—

"In dealing with their workmen the company have adopted the premium system so far as is possible. Every standard part has a certain 'reference rate' as a basis of payment, and if the workman produces it more cheaply the difference is divided in equal proportions between himself and the company. Certain regulations are in force for preventing the arbitrary cutting down of rates and so depriving the workman of his reward for increased skill, and the arrangement has been found to work satisfactorily to both sides. In the great engineers' strike of 1899 not a single man left the company's employment, and the only trouble experienced was from the difficulty of obtaining raw material. Most of the members of the staff received a contingent salary, dependent upon the general profits, in addition to the fixed stipend."

Feilden's Magazine has an article by Mr. J. H. Dales on "high-speed" engines; not locomotives, but stationary engines working at high speed, and their advantages in economy and safety. The subject is a very interesting one to all who have an interest in machinery at all, and is to be continued. There is also an article on "The Design and Construction of Groynes" by Mr. R. G. Allanson-Winn. The most important point in the paper is the author's advocacy of slanting groynes, rather than groynes at right angles to the sea line; and his reasons for the recommendation, and his experience as to the action of slanting groynes, should be considered.

The *Gentleman's Magazine* contains an interesting historical and archæological article on "The Three Towers of Grasse," by Mr. F. G. Dunlop-Wallace-Goodbody (we reproduce conscientiously both the hyphens), and in the same number is a paper on "Jewelry (*sic*) and Gems" by Miss Emily Hill, which contains some information and also some sensible remarks on the æsthetic side of the subject.

In *Knowledge* Mr. W. F. Denning's article on "The Real Paths of Fireballs and Shooting Stars" may assist ordinary observers of these beautiful phenomena to form a clearer conception of the actual scientifically ascertained facts in regard to their flight and distance.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. Arthur Evans having, for reasons of health, been obliged to postpone his paper on "The Palace of Knossos in Crete," the general meeting of the Institute fixed for Monday, December 16, will not take place.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE third meeting of the Discussion Section was held at 56, Great Marlborough-street, W., on the 6th inst., Mr. R. H. Weymouth presiding.

The minutes of the last meeting were read and confirmed. During question time several questions were asked and answered by the members.

The Chairman then called upon Mr. Sydney Perks to read a paper entitled "The Ethics of Dilapidations." The discussion was commenced by Mr. Geo. H. Smith, who proposed a vote of thanks to Mr. Perks for his interesting paper, in which the somewhat dry subject of dilapidations had been exhaustively treated. The vote of thanks was seconded by Mr. Trent Brown, who advocated the preparation of a schedule of dilapidations at the commencement of tenancy.

The following gentlemen joined in the discussion, which was of a most instructive nature, viz.:—Messrs. Nicholson, F. G. Buss, C. H. Brodie, W. B. Hopkins, and Louis Jacob.

Mr. Douglass Mathews, who had kindly consented to be present as Special Visitor, then proceeded to sum up the discussion in a practical manner by giving the members the benefit of his experience.

The vote of thanks was carried with acclamation. Mr. Perks having replied, the meeting terminated.

It was announced that the next meeting would be held on Friday, December 20, when Mr. Howard Humphreys will read a paper on "Cement and Cement Testing."

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—There was a crowded attendance at the meeting of this Institution on December 6th, held at the Westminster Palace Hotel, the Chairman (Mr. Percival Marshall) presiding, the paper read being on "Street Railway Construction for Electric Traction," by Mr. F. S. Pilling (member), of Devonport. In introducing the subject, the author pointed out how necessary it was in laying out a tramway scheme to keep well in mind the object of such an undertaking, viz., to attract the largest possible number of passengers. Unless the engineer were familiar with the working of the system from the traffic-manager's point of view, there would ultimately be failure somewhere, preventing the lines from being worked at their full earning capacity. Reference was made to the arrangement of termini as affecting the car mileage, and to the mistake often committed of constructing double junctions between main and branch lines with no provision on the main line at the junction for transferring a car from one line to the other, with the result that when the cars were being distributed in the morning and were returning in the evening, they frequently had a profitless run of perhaps 300 or 400 yards to the nearest cross-over in order to be transferred to the right line outwards or inwards. The objections to constant radius curves were dwelt upon, and the writer showed that the application of railway practice to permanent-way construction for tramways on public highways was a mistake. In considering the construction of the track the difficulty was to make and maintain it in an absolutely rigid condition. The weakness arose in the jointing of the rails, the most satisfactory type of which at present, to meet British requirements, was the girder with a weight of not less than 90 lbs. per yard. Considerations affecting the design of rail section for electric traction purposes were then entered into, and the chemical composition touched upon. In treating the question of rail-joints, and to show the necessity of perfect rigidity in them, the author theoretically investigated the problem of a loaded car meeting with obstruction through an imperfect joint, proving that the defacing force of the blow upon the joint would be equal to that given by a steam hammer, the head of which weighed 4,000 lbs., falling at a velocity of practically 3 ft. per second at the moment of impact. Sole plates were not to be commended. The adoption of a deeper rail section with a very much wider sole than is usually employed, together with the use of deep-ribbed fish-plates secured by means of six pairs of bolts, would probably be found advantageous, the bonds taking the form of copper rivets of large area, compressed into holes

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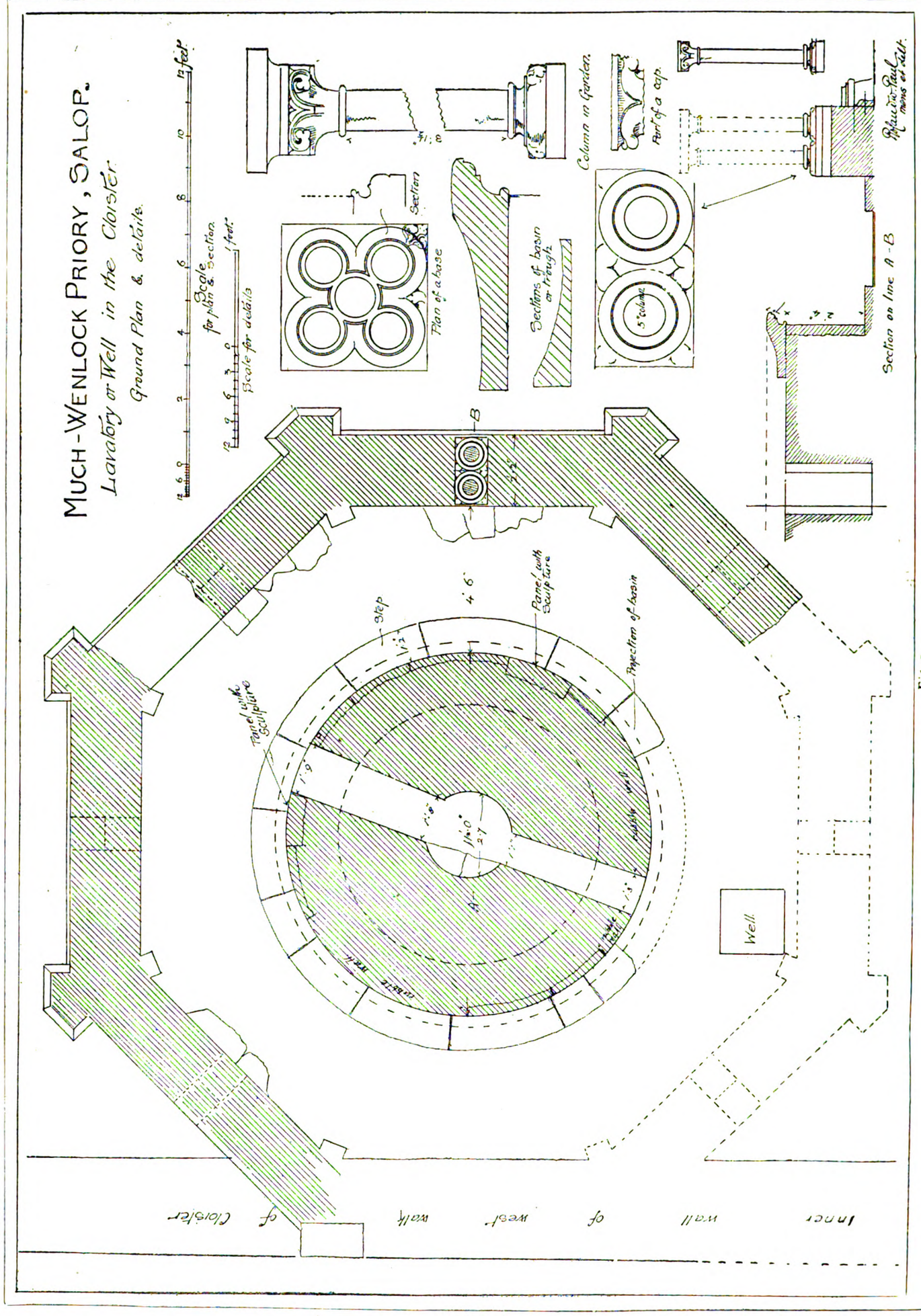

drilled through both plates and the web of the rail. Reference was made to the Falk system of cast weld solid jointing, it being stated that the joint produced was an expensive one and liable to fracture, though the percentage of failures was claimed to be extremely low. The processes in connexion with rail-laying were then dealt with, and the very great importance of good bonding was emphasised. Points and crossings having been considered, questions relating to the preparation of the concrete forming the bedding were treated, and in conclusion the best materials to employ in the laying of the paving were considered, the use of all kinds of wood-block paving being regarded as unsuitable. In the discussion which followed, Messrs. A. F. Gatrill, A. H. Stanley, H. Stevens, A. H. Tyler, V. H. Chabot, W. J. Tennant, T. C. Morewood, K. Gray, L. H. Rugg, C. J. McNaught, T. E. Moorhouse, and the Chairman took part, and the proceedings

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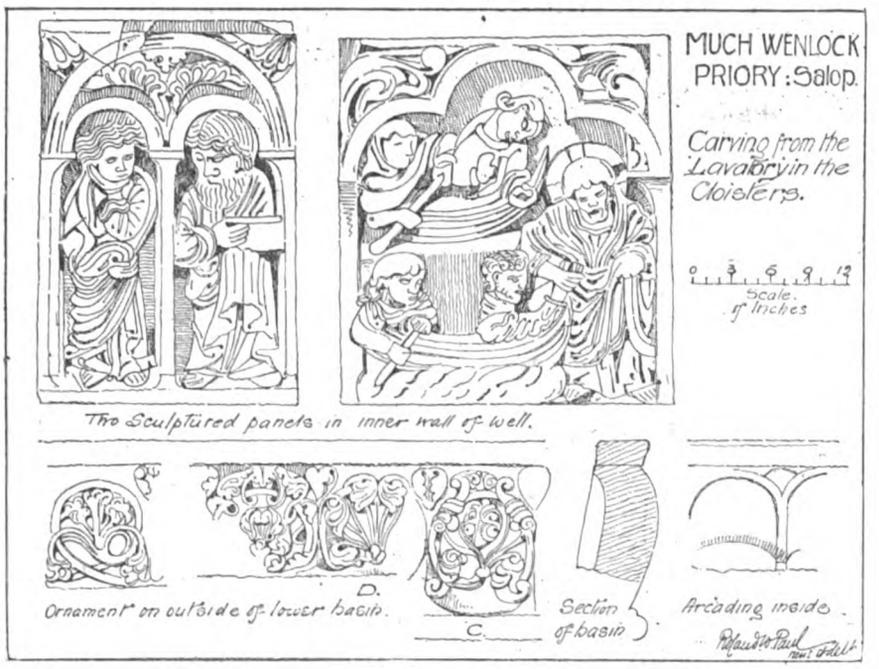

Fig. 2.

closed with the announcement of the visit on Saturday afternoon, December 14, to the Croydon Corporation Combined Electric Light and Traction Works.

SOCIETY OF ENGINEERS.—The forty-eighth annual general meeting of the Society of Engineers was held on December 9, at the offices of the Society, 17, Victoria-street, Westminster. The chair was occupied by Mr. Charles Mason, President. The following gentlemen were duly elected by ballot as the Council and officers for 1902, viz.:—As President, Mr. Percy Griffith; as Vice-Presidents, Messrs. James Patten Barber, David Butler Butler, and Nicholas James West; as ordinary members of Council, Messrs. Joseph Bernays, G. A. Pryce Cuxson, George A. Goodwin, W. H. Holttum, R. St. George Moore, Henry Sherley-Price, Joseph W. Wilson, and Maurice Wilson; as hon. secretary and treasurer, Mr. George Burt; as hon. auditor, Mr. Samuel Wood, F.C.A.

NORTHAMPTON INSTITUTE, CLERKENWELL.—On Friday, the 6th inst., the Marquis of Northampton presented the prizes and certificates awarded to students at the Northampton Institute (City Polytechnic, St. John-street-road, Clerkenwell) during the last session. In his address to the students the Marquis said that in these days of keen foreign competition the provision of a higher standard of technical education was absolutely necessary, and it was the duty of those to whom such opportunities were afforded to make the utmost use of them. They should remember that the true object of education was not merely self-advancement, but the general welfare of the nation, and if it were true that foreigners were ahead of us in the matter of technical education, he was heartily glad the fact was being emphasised, for it would stimulate our efforts to maintain and improve our position.—During the evening the workshops and classrooms of the Institute were open to visitors to view the exhibits and witness demonstrations of the students' ability. In the artistic crafts' department were shown some specimens of decorative metal work for architectural and general purposes. These were executed by instructors and students, and comprised chandeliers, lamps, electroliers, screens, and general fittings of good design and finish. An exhibition of building materials contained examples of plasterers' work and brick arches of varied style at different stages of construction, and a demonstration showed that the work is done with care and accuracy. The permanent exhibits are very interesting, and include a large number of models illustrating the principal styles of architecture, some delicately carved panels and ornaments of French and Flemish origin, and several plaster casts of lock plates belonging to the fifteenth century.

PARISH HALL, COALBROOKDALE, SHROPSHIRE.—This hall has just been completed by the contractor, Mr. T. Pace, of Shrewsbury. Due regard in designing has been paid to its wooded hill surroundings, the materials employed being Ruabon bricks with Grimshill stone dressings and red Lightmoor tiles. The main hall has a semi-octagonal roof with carved and traceried trusses. Mr. Harbottle Reed, of Exeter, is the architect.

MUCH WENLOCK PRIORY, SALOP.

IN the cloister court of the ruined Cluniac monastery at Much Wenlock are the foundations of a building which, when perfect, seems to have been a fountain well and lavatory (fig. 1). It consists of a circular centre 11 ft. in diameter, the sides about 2 ft. 4 in. in height, enclosed at a distance of 4 ft. 6 in. by a wall 2 ft. 2 in. thick, octagonal in shape, with the bases of pilaster buttresses and vaulting shafts at the angles. The west side of the octagon coincides with the inner wall of the west alley of the cloister, from which it was evidently approached. The outer octagonal wall exists only for a height of about a couple of feet above the ground line, but from various details now placed on the walls, each side appears to have had an arcade of two bays supported in the centre by the coupled columns, of which a perfect example still exists in the garden near the cloister. A base showing a group of five columns may have formed the central shaft of the west entrance from the cloister.

The face of the circular well or fountain consists chiefly of slabs of stone, 2 ft. 4 in. in height and about 4 in. in thickness, and rubble walling of more recent date. On the east and north sides are two sculptured panels, one with

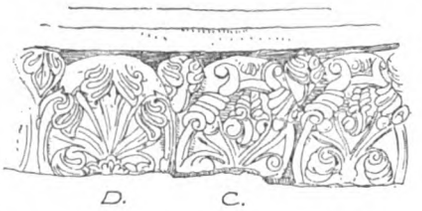

Fig. 3.—Ornament (reversed) from a Rock Dwelling Illustrated in Mrs. Bishop's Book, "The Yangtze Valley and Beyond."

two saints under a Norman arcade, and the other apparently of slightly later date, with a representation of what appears to be Christ walking on the water. The space between the lower boat and the bottom of the panel is occupied by fishes. Arranged on the walls of the well are several fragments of the lower trough or basin; there are remains of more than one of these. In one example, the outside is covered with elaborate carving of a conventional type (fig. 2), and the inside is arcaded. Most of these details are here illustrated, and also a ground plan given of the foundations and walls remaining. A ground plan of the abbey (made by Mr. T. L. Worthington) was given in the *Builder*, May 23, 1885, and the position of the well is shown, although the line of the west walk of the cloister is omitted. Its position, however, is easily shown by the doorways in the north and south walls of the cloister, from the church and frater respectively.

Within a few days of making the drawings of the well at Much Wenlock, I happened to see Mrs. Bishop's book entitled "The Yangtze Valley and Beyond" (John Murray, 1899). On page 468 a stone frieze from a rock dwelling on the banks of the Min River is described and illustrated, the conventional ornament on it (fig. 3) being identical with that on some of the fragments of the well at Wenlock. The carved stones at Wenlock have all the appearance of having formed part of the building on which they are now placed, and I have so far been unable to get any evidence that they have been brought from abroad.

If the work at Wenlock originally belonged to the well, the exact similarity of pattern is remarkable.

In the carved frieze shown in Mrs. Bishop's book the pattern is the reverse of that at Wenlock. In the tracing here given it has been inverted so that the comparison between the two can be more easily made.

ROLAND W. PAUL.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Strike at Horton Asylum.—Mr. Beachcroft asked the Chairman of the Finance Committee if he had anything to report with reference to the strike which took place at Horton Asylum about three weeks ago, and which caused a number of bricklayers, labourers, and others to be without employment.

Lord Welby said the Works Sub-Committee had received a deputation that day, and had had a full conversation as to the disagreement between the bricklayers and tilers. He hoped the matter would soon be settled.

Overhanging Structures.—Several petitions were presented against the proposed by-laws as to height and weight of shop blinds, lamps, &c., overhanging the footways, and at a later stage of the sitting Mr. Goddard Clarke, Chairman of the Building Act Committee, stated, in reply to Mr. Pomeroy, that the proposed by-laws had been circulated in draft for the observations of Local Authorities, but would not be presented to the Council for discussion until next year. Meanwhile, he might say that the public need not fear any such drastic proposals as had been rumoured.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Battersea Borough Council 10,000*l.* for electric light installation and 3,815*l.* for street improvements; the Hackney Borough Council, 35,800*l.* for electric light installation and dust destructor; the Kensington Borough Council, 14,400*l.* for street improvement; the Lewisham Borough Council, 1,325*l.* for laying out an open space; the St. Pancras Borough Council, 18,210*l.* for electric light installation and meters; the Shoreditch Borough Council, 5,300*l.* for the erection of lodging-houses; the Westminster City Council, 24,000*l.* for alterations to the Town Hall; the Mile End Old Town Guardians, 1,575*l.* for paving works at workhouse; and the Wandsworth and Clapham Guardians, 1,270*l.* for alterations at the workhouse.

Improvements.—The Improvements Committee recommended, and after discussion it was agreed—(*a*) That the estimate of 2,614*l.* submitted by the Finance Committee be approved, and that a contribution be made on the usual conditions of two-thirds of the net cost of the widening of King's-road, Chelsea, at Nos. 157 to 165, Nos. 204 to 230, and Nos. 303 to 341, proposed to be undertaken by the Council of the Metropolitan Borough of Chelsea. (*b*) That the estimate of 428*l.* submitted by the Finance Committee be approved, and that a contribution be made on the usual conditions of one-half of the net cost of the widening of Beaufort-street to 50 ft. proposed to be undertaken by the Council of the Metropolitan Borough of Chelsea. It was also agreed: That the estimate of 7,550*l.* submitted by the Finance Committee be approved, and that a contribution be made on the usual conditions of one-half of the net cost of widening Brompton-road between Brompton-square and No. 186, Brompton-road, proposed to be undertaken by the Council of the Metropolitan Borough of Kensington.

Tramways.—The Parliamentary Committee recommended, and it was agreed, that the London County Council (Tramways and Improvements) Bill be approved, that the seal of the Council be affixed to a petition for leave to

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bring in the Bill, and that the Bill and petition be deposited pursuant to the Standing Orders of Parliament, with such necessary alterations (if any) in the Bill as the Parliamentary Committee may consider desirable.

The Council seek power to construct the following tramways :—

Seven Sisters-road (existing lines), via Amhurst Park, to Upper Clapton-road (existing lines).

Chelsea Bridge (north end), via Grosvenor-road, to a point near Lambeth Bridge.

Hampstead-road, across Euston-road and along Tottenham Court-road, to a point near Oxford-street.

Edgware-road (from a point near the Marble Arch), to the County boundary at Cricklewood.

Hammersmith Broadway, via Queen's-street, Fulham Palace-road, High-street, Fulham, and Putney Bridge to the Lower Richmond-road.

Along the Victoria Embankment from a point near Westminster Bridge to a point near Blackfriars Bridge.

Along Elgin-avenue, from Malda-vale to Harrow-road.

Clapham Common, south side (existing tramways), via Clapham Common, Battersea-rise, Wandsworth Common, north side, East-hill, and West-hill, to the County boundary in Kingston-road.

Deptford (existing tramways), via Blackheath road and hill, Shooter's Hill-road, to the Herbert Hospital, and from thence via Woolwich Common-road, the road to the west of St. George's (garrison) Church into New-road, and Thomas-street and Green's End to Beresford-square, Woolwich, and returning along New-road and Mill-lane to a point in Woolwich Common-road near Nightingale-place.

New Cross-road to High-street, Lewisham.

Streatham High-street via Streatham High-road, to the County boundary at Norbury.

Camberwell-green via Denmark Hill, Champion Park, Grove-vale and Lordship-lane, to a point near the intersection of that thoroughfare with Crystal Palace-road.

Trafalgar-road, Greenwich, via Blackheath-lane, to a point near the southern approach to the Blackwall Tunnel.

Herbert Hospital, via Wellhall-lane, to Eltham.

The Bill also seeks powers to run necessary omnibus services, and also to widen various thoroughfares.

The Highways Committee recommended, and it was agreed :—

"That the underground system of electrical traction, submitted by the Highways Committee, be approved for use on the London County Council Tramways between—(*a*) Kennington-road, at its junction with Westminster Bridge-road, and St. George's Circus; (*b*) the Elephant and Castle via New and Old Kent-roads, and New Cross-gate; (*c*) the Elephant and Castle and St. George's Church, Borough, and thence to the junction of New and Old Kent-roads; (*d*) the Elephant and Castle, via Walworth-road and Camberwell-road, and New Cross-gate; (*e*) Camberwell Green and the terminus near Vauxhall Bridge; and (*f*) Kennington Park-road and Brixton-road."

The Underground Tramways Scheme.—The Parliamentary Committee also brought up a draft, which they recommended the Council to adopt, of the London County Council (Subways and Tramways) Bill, which proposes the construction of a shallow underground tramway from the Victoria Embankment to Holborn.

The Council approved the Bill.

View from Richmond-hill.—The London County Council (General Powers) Bill combines a large variety of subjects, including the purchase of three properties for addition to public parks, the Marble-hill scheme for the preservation of the view from Richmond-hill, and common lodging-houses.

Lord Monkswell, Chairman of the Parks Committee, stated that the option of purchase by the Council of the Marble-hill estate had been extended to June 30, 1902.

The Bill was approved.

The Electric Supply Bill.—This measure deals with the purchase of electric supply undertakings by Local Authorities, and proposes also to give the County Council power to supply electricity in bulk to Borough Councils desiring it.

The Council approved the Bill.

The Water Purchase Bill.—The Parliamentary Committee submitted a resolution for a Bill for the purchase by the Council of the undertakings of the eight metropolitan water companies, on similar lines to the rejected projects of previous Sessions.

The Council adopted the recommendation of the Committee to proceed with the Bill.

Rules for Theatres Licensed by the Council.—The Theatres and Music Halls Committee submitted a revised code of rules and regulations for theatres licensed by the Council. The following are the rules which principally affect our readers :—

5. All doors and barriers must open outwards.

6. All gangways, passages, and staircases must be kept entirely free from chairs or any other obstructions, whether permanent or temporary.

7. All exit and other doors or openings used by the public for the purposes of exit must be indicated by notices clearly painted to the satisfaction of the Council in 7-in. letters. Such notices must be painted over such doors or openings at a height of at least 6 ft. 9 in. above the floor. The words "No Exit" must be clearly painted to the satisfaction of the Council in 7-in. letters at least 6 ft. 9 in. above the floor, over all doors or openings, which are in sight of the audience, but which do not lead to exits.

8. All doors used for purposes of exit must, if fastened during the time the public are in the building, be secured during such time by automatic bolts only, of a pattern and position to be approved by the Council, and the management must allow the public to leave by all exit doors.

9. All curtains covering doors or in passages must be hung so as not to trail on the ground.

10. An ample water supply, with hose and pipes, shall be available to all parts of the house, where possible on the high-pressure main.

11. All fixed and ordinary gas burners on or about the stage must be furnished with efficient guards; movable and occasional lights must be, where possible, protected in the same manner, and put under charge of persons responsible for lighting, watching, and extinguishing them.

12. All gas pipes must be made of iron or brass.

13. An additional means of lighting for use in the event of the principal system being extinguished must be provided in the auditorium, corridors, passages, exits, and staircases, and if oil or candle lamps are used for this purpose they must be of a pattern to be approved by the Council, properly secured to an uninflammable base out of reach of the public. Such lamps must be kept alight during the whole time the public are in the premises, and no mineral oil must be used in them.

14. The rows and lines of lights and gas burners in the wings must commence 4 ft. at least from the level of the stage, and be protected by fixed iron wire guards.

15. Blankets or rugs, and buckets filled with water must be always kept on the stage and in the flies, scene docks and immediate passages approaching the dressing-rooms, ready for instant use, and attention must be directed to them by placards legibly printed or painted and fixed immediately above them. Some person must be held responsible by the management for keeping the blankets or rugs and fire appliances ready for immediate use.

16. Hatchets, hooks, ladders, and other appliances for taking down hanging scenery in case of fire, where such scenery is in use, must be always kept in readiness for immediate use.

17. Information of any outbreak of fire, however slight, must be at once communicated to the Metropolitan Fire Brigade.

18. The corridors must not be used as cloak-rooms, and no pegs for hanging hats and cloaks shall be allowed therein.

19. No decoration, or construction for the purpose of decoration must be employed in dressing-rooms which does not adhere without any cavities to the surface of the wall.

20. All open fireplaces or stoves must be protected by strong fixed iron wire guards and fenders, part of which may be made to open for all necessary purposes.

21. All gas burners within reach of the audience must be protected by glass or wire globes.

22. All gas taps within reach of the public must be made secret.

23. The fire-resisting screen fitted in the proscenium opening must be worked daily in the presence of the audience so as to ensure the arrangements being in proper order.

27. All hangings, curtains, and draperies must be rendered non-inflammable.

30. No structural alteration must be made in the theatre without the sanction of the Council. Plans and particulars of such proposed alterations must be sent to the Clerk of the Council.

31. The manager is held solely and entirely responsible for the carrying out of the above regulations, for the management of the theatre before and behind the curtain, and for the safety of the public and the employees in the event of fire or panic.

33. The following notice to the public shall be printed on the programme of the performance or legibly exhibited in every part of the theatre :—

In accordance with the requirements of the London County Council—

(1) The public may leave the theatre at the end of the performance by all exit doors.

(2) The fireproof screen to the proscenium opening is lowered at least once during every performance to ensure its being in proper working order.

The Report was adopted, with an additional rule, taken from the Lord Chamberlain's regulations, as to the counterweighting of drop scenes and the testing of the apparatus.

The Proposed American Building in the Strand.—Mr. Hubbard, Chairman of the Corporate Property Committee, stated, in reply to Mr. R. Williams, that the offer of the American syndicate to lease a large portion of the proposed crescent site in the Strand had been referred to the valuer and the solicitor.

Tender.—It was agreed to expend 261*l.* on repairing portions of the wood paving of the carriage-way of Westminster Bridge.

Houses of Historic Interest in London.—The Historical Records and Buildings Committee brought up the following Report :—

"Many houses in London are of considerable interest owing to the fact that they have been associated with historical events or distinguished individuals, and, in our opinion, one of the most important matters in which the Council, under the powers of the two Acts of Parliament authorising such work, can with advantage take action, is to arrange for some suitable indication being given of the associations connected with such houses. As a matter of fact, the Society of Arts has for some time past been engaged in work in this direction, and has affixed memorial tablets on thirty-four houses which have been the residences of celebrated men and women. We take this opportunity of expressing our appreciation of the public-spirited action of the Society in the matter, and we think that, if carried out systematically, a very valuable work could in time be accomplished all over London. Unfortunately the Society are not able to give that attention to the work which is desirable, and they have intimated to us that they would very gladly see the work performed by the Council. We have accordingly been in communication with the Society on this latter point, and have now received a letter, in which they express their readiness to place at the Council's disposal whatever information they have collected on the subject, and to afford the Council in the future any assistance in their power. In these circumstances we have no hesitation in recommending the Council to take over the work. In the event of the Council agreeing with our recommendation, we do not propose to incur any expenditure in connexion with the work during the present financial year, but the necessary provision will of course be made in next year's estimates, and we would observe that this would not extend beyond a sum necessary to purchase the required number of wall plates. We recommend—'That, subject to the passing of the annual maintenance estimates for 1902-3, the work of indicating houses of historical interest in London be undertaken by the Council, and that it be referred to the Historical Records and Buildings Committee to make the necessary arrangements for the execution of the work.'"

Shops and Dwellings, Shoreditch.—The Housing Committee recommended, and it was agreed :—

"That the sketch plans submitted by the Council of the Metropolitan Borough of Shoreditch of the shops, with dwellings over, proposed to be erected on plots 6, 8, and 10 of the area cleared under the Moira-place and Plumber's-place scheme, be approved, subject (*a*) to the details of planning as to the water-closets and sculleries, and as to the size of the bedrooms being amended to the satisfaction of the Council's architect, and (*b*) to any necessary approval under the London Building Acts being subsequently obtained."

The Council adjourned shortly after seven o'clock.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The members of the Liverpool Architectural Society met at the Law Library, Castle-street, on the 2nd inst., when Mr. C. E. Bateman delivered an address on "Castle Bromwich Church." He dealt in detail with the construction of the church and its chief architectural features, his remarks being illustrated by lantern slides and plans.

YORK ARCHITECTURAL SOCIETY.—The members of the York Architectural Society held their annual dinner in the White Swan Hotel, Pavement, recently. Mr. C. H. Channon, F.R.I.B.A., member of the Council of the Royal Institute, presided. The loyal toasts having been honoured, Mr. A. B. Burleigh proposed "The Archbishop of York, the Clergy, and Ministers of all Denominations." There was, he said, a bond of union between architects and the Church, and there was, or should be, mutual good feeling existing between them. The holy men of yore were architects. Our minsters, our abbeys, which, he was sorry to say, were now in ruins, were the work of those men. They were not only architects, but were builders too; they knew how to erect as well as to design. In speaking of the Dean, he said he had a great work in hand—the restoration of York Minster. That building had withstood the ravages of time. Others had

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gone to decay, like St. Mary's Abbey, Rievaulx, and Fountains, but York Minster stood to-day the same as when it was completed. Unfortunately, decay was shown in the exterior, and in Mr. Bodley they had one of the ablest men engaged in its restoration; he was not only an architect, but he was an artist. The Dean should have the support of every man in Yorkshire in the great work he had undertaken to restore the Minster.—The Rev. G. H. Hewison responded, and expressed the belief that as fine buildings could be built in the present day as in the Middle Ages if we only had the money to spend on the work of erection.—Mr. A. Pollard proposed "The Royal Institute of British Architects and Allied Societies." Though the parent society was not an educational society, he expressed the hope that the day was not far distant before it would be able to see its way to helping the members to gain a thorough grounding in their profession.—Mr. W. J. Locke, secretary of the Institute, in responding, said that the President and Mr. Alexander Graham, honorary secretary of the Institute, regretted very much their inability to be present. He went on to say that the Royal Institute thoroughly recognised the great aid which the allied societies had given to the Institute. He had heard, and he supposed all present had heard, rumours and complaints perhaps that the Institute existed chiefly for London men and did not pay sufficient attention to the interests of provincial men. He did not think that was the case; they regarded it as a matter of great importance that they should gain the co-operation of their brethren in the provinces. The question of professional status was a very burning one. He supposed that it was the same in York as in other provincial centres. The one cry was, "Our professional position is not recognised by the public." Those at the headquarters of the Royal Institute thoroughly appreciated the fact, and would do all they could to remedy it. One remedy proposed was a matter of vital importance, and that was registration. It was looked on as the panacea for all disabilities under which architects suffered. The Institute had been accused in many quarters of standing in the way of the great principle of registration, but as long as any registration is put forward in which sixty years of strenuous work and diplomas of the Institute were not recognised as the basis, as it were, of the closure to the profession, the Institute would not act. He said that whilst so many qualified members of the profession in England did not join the Royal Institute it would not be in a position to come before Parliament with a cry for registration. He urged the necessity of as many qualified members of the profession as possible coming into the ranks of the Institute. Their professional status needed strengthening and the public needed education in architecture, not only on the artistic side, but on the professional side. Every day brought forward some curious instance of the public ignorance in this respect. It seemed the absolute duty of the profession and the societies which they represented to do all they possibly could to raise the status of the profession.—Mr. Butler Wilson also replied, and spoke of the enormous amount of work which was done at the Royal Institute. He contended that the Institute showed a willingness to help in every way the formation of allied societies, and if those societies took advantage of what was offered to them by the Institute he felt certain that their membership would increase, and the importance of the Royal Institute would increase also. He spoke on the matter of competitions, and expressed himself in favour of the present mode of the President of the Institute appointing assessors. In arranging competitions, it was exceedingly important that the public should be educated to understand that in competitions fair play must be given all round. The Rev. H. Mayall proposed "The York Architectural Society," which was replied to by the President. "Prosperity to the City of York" was proposed by Mr. H. Perkin, and replied to by Alderman Purnell, and this concluded the toast list.

ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY, NORTHAMPTON AND OLDHAM.—The fifty-sixth annual meeting of the Architectural and Archæological Society for the Archdeaconries of Northampton and Oldham was held at the Society's rooms, Sheep-street, Northampton, on Monday morning. Previous to the meeting a committee meeting was held, when new members were elected and books presented to the Society were acknowledged. At the annual meeting the chair was taken by the Rev. A. W. Pultney, and Mr. Wentworth Vernon was elected vice-president in the place of Sir Charles Isham resigned. The committee was re-elected with the addition of the Rev. F. Churchill, and the hon. secs., Mr. C. A. Markham and the Rev. A. K. Pavey, were also re-elected. Mr. J. A. Gotch then read a paper on "Renaissance Architecture in Northamptonshire." Mr. Gotch said that to many people the word "renaissance" conveyed different meanings, but he desired that it should indicate that period of architecture which was in effect the transition from the Gothic to the Classic. So far as Northamptonshire was concerned, the Italian forms did not seem to have obtained a very great footing except in the matter of tombs. The first example of this work was a piece of panelling and chimney-piece at Deene Hall; and Italian forms affected to a more or less extent church architecture, but they had not very many examples in the county of churches affected by the earlier work of Italian ornaments. Mr. Gotch showed photographs and plans of houses of this period, which included Dingley Hall, Holdenby House, Kirby Hall, Apethorpe House, Canons Ashby Hall, Burleigh House, and other well-known examples in the county.

ARCHITECTURAL ASSOCIATION OF IRELAND.—At an ordinary general meeting of this Association, held at 20, Lincoln-place, Dublin, on Tuesday evening, December 3, Mr. G. F. Sheridan in the chair, two short papers were read. The first, by Mr. E. Bradbury (one of the Honorary Secretaries), dealt with Northamptonshire as a field for sketching and study for architects, and in it the lecturer described briefly, and in some cases illustrated by sketches, a large number of churches and old houses in the villages and towns of Northamptonshire. In proposing a vote of thanks to the lecturer, Mr. F. G. Hicks suggested that it might be possible to arrange that a party made up of members of the Association should, during the ensuing summer, visit some of the places described, a proposal which met with considerable approval. Mr. T. E. Hudman also gave a short lecture on "Architectural Odds and Ends," in which he described a few strange experiences he had had whilst on sketching trips, and also some interesting, but very little known, facts in connexion with matters of an architectural nature.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At the meeting on December 6, the President, Mr. W. H. Bidlake, in the chair, Mr. H. H. Statham read a paper on the "Architectural Treatment of Bridges." He said the question was quite a recent one, for in the Mediæval period bridges were only regarded as utilitarian structures and not built to be picturesque, though we might think them picturesque now; and in the modern period bridges till recently were considered almost entirely as practical engineer's work, and in some respects rightly, since foundations in deep water were out of the scope of an architect's experience and education. Recently it had begun to be perceived that bridges in large cities might have an important effect on city architecture, and engineers had got an idea that bridges should be "handsome," but their attempts in the way of design had been exceedingly unfortunate. The question, therefore, had now arisen, whether in England, as in France, architects ought not to be commissioned to take part in the design of such structures. Bridges might be classed under three heads; those entirely of masonry; those of masonry piers and steel spans; and those of steel entirely. The latter were best treated as pure construction, with no attempt at ornament; the structural lines giving the interest to them. Bridges entirely of masonry were among the most fascinating of structures, and had so much of the element of architectural effect in them that even if left quite plain they could not but be fine objects. In a city, however, it was not only legitimate but desirable to treat a monumental bridge so as to connect the architecture on the two banks, carrying the architectural effect across the river. And in such bridges it appeared to him that the superstructure was really more architectural than engineering work; and that instead of an engineer being commissioned to build a bridge with an architect to assist him in the architectural details, it might be more rightly put that an architect should be commissioned to build it, with an engineer to lay the foundations. If an architect could not build a large arch, what was the good of him? The treatment of masonry bridges might be considered under the heads of the pier, the arch, the spandrels, and the horizontal or nearly horizontal lines of cornice and parapet. The pier was generally brought out beyond the line of the arch-plane, both for real and apparent solidity; and this projection should be treated as what it really was—a buttress, not as a place for columns or pilasters, especially not such absurd over-grown stumpy columns as they had seen in Blackfriars Bridge and other recent engineering works. The lower portion of the pier, subjected to the stress of the water, should rightly be treated differently from the upper portion, as it had a special function. In a tidal river it should be formed on both faces as a cut-water, but in a stream only the up-stream face should take that form; a certain rounding off on the down-stream side was desirable, but not to make both sides the same, which was like designing the stem and stern of a ship on the same lines. As to the form of the arch, a semi-circular arch, though it looked very well, was impossible in these days, as it did not allow a sufficiently wide waterway. They had the choice of the elliptical or the segmental arch. The former was the finest in appearance, and had the advantage that it gave a higher headway near the piers, and sprung from them tangentially, whereas a wide and shallow segmental arch made a harsh angle with the pier, and had the appearance of being jammed between the piers instead of springing from them. An elliptical arch would be somewhat flatter in the crown than a segmental arch of the same span and rise, and hence required more careful construction. The system of building the soffit of the arch in a series of parallel ribs, often used in mediæval bridges, added an appearance of power to a moderate sized bridge, but in a bridge on the largest scale perhaps it was not so fine as the sweep of the flat unbroken soffit. The treatment of the spandrels of the arches would depend a little on the treatment of the arch. If, as in London Bridge, the rustication of the voussoirs was on the same plane with that of the spandrel masonry, the latter was best left quite plain. If, on the other hand, the voussoirs were strongly accentuated so as to leave a well-defined spandrel, then the spandrel might be a field for decorative treatment, either by the introduction of a medallion or an escutcheon in the centre, or, in the case of a comparatively small bridge, by filling up the space with bas-relief sculpture. On a bridge of the largest size this would hardly do, as the sculpture would have to be on too large a scale, and moreover filling up so large a space with ornamental treatment would destroy the severe and monumental character proper to a great bridge. There was at all events one thing *not* to do with the spandrel—not to fill it up with a panel following the bounding lines of the space. To do that was at once to destroy its masonic character and reduce it to a piece of joinery. In regard to the cornice and parapet lines, if the roadway of a large bridge could be kept perfectly level, as in Waterloo Bridge, then a massive cornice could be used, which would break round the projections of the piers; but where, as in most cases, the roadway had to be a raking line, a heavy cornice should be avoided—it was a feature too rigid for such a position; there should in that case be only a small cornice or corbel-table; and the raking lines of this and of the balustrade should not be carried round the piers, but should stop against them. To mitre the raking cornice and parapet round the piers was a common mistake, and was an illogical and unworkmanlike proceeding; the piers were vertical abutments, and any lines or string-courses on them should be truly horizontal; they should interrupt the rake of the balustrade and not partake of it. A number of lantern slides of various bridges were shown in illustration of the various points mentioned in the paper.

CHURCH, MARGATE.—The Archbishop of Canterbury consecrated recently the new district Church of St. Augustine of Canterbury at Margate. The church, which has been built from the designs of Mr. Dalby Reeve, of Margate, has been erected at a present cost of 5,000*l*. It is of brick, with Bath stone dressings, and consists of nave and aisles, to which it is intended to add an apsidal chancel at a further cost of 2,000*l*.

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ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE. — At the general meeting on Wednesday, December 4, Mr. Emanuel Green in the chair, Mr. Alfred C. Fryer read a paper on "Fonts with Representations of the Seven Sacraments," and exhibited ninety-one lantern slides in illustration of his paper. There are twenty-nine fonts known upon which sculpture representing the seven sacraments have been carved. Sixteen are in Norfolk, eleven in Suffolk, one in Kent, and one in Somerset. The sacrament of Baptism is usually portrayed by the priest immersing a nude infant in an octagonal font. and he is accompanied by acolytes holding the open book of the ritual and the casket of holy oils. The bishop is generally depicted in these fifteenth century fonts vested in his long rochet and mozetta or tippet when giving Confirmation.

In every instance infants are being presented to the bishop and the child is held by the godfather or godmother according as it is a boy or a girl. In the panel representing the Holy Eucharist the sculptor has usually depicted the moment when the priest, standing before the altar, is elevating the chalice or the sacred Host. Candlesticks are found upon four of the altars, and acolytes holding tall flaming torches are depicted on five of the sculptures. At Woodbridge and Great Glenham the priest is communicating a man and a woman who hold a houseling-cloth before them, while at Farningham the priest is genuflecting after the consecration. The sacrament of Penance is depicted by a priest seated in a chair shriving a kneeling penitent, and is frequently accompanied by an angle with wings spread widely over both priest and penitent. The evil spirit with horned head and dragon wings is departing crestfallen and confounded. When the plaster was removed from the font at Gresham, in Norfolk, the evil spirit is said to have represented so dreadful an appearance that his figure was chipped away, and now only the outline remains. The sacrament of Extreme Unction is administered by a priest who is represented dipping his thumb in the holy oil and anointing the dying person. The sculpture at Gresham shows a circular object placed on the bed, which is doubtless the dish on which four lumps of cotton-wool are placed in the form of a cross, with which the priest wiped the places he had anointed. Holy Orders is portrayed by either the ordination of a priest or deacon. The bishop is generally vested in alb, tunicle, dalmatic, chasuble, and mitre, and, holding his pastoral staff in his left hand, he lays his right hand on the head of the kneeling candidate. If a sub-deacon is being ordained a deacon he is vested in a dalmatic, but if a deacon is being raised to the priesthood he is robed in a chasuble. Several ecclesiastics accompany the bishop; one holds the open book of the ritual, another the casket of holy oil, while another is doubtless the archdeacon, whose duty it was to present the candidate or ordination. At Nettlecombe, in Somerset, while the bishop is ordaining a candidate, a barber, dressed in a short tunic, hosen, boots, and round hat, is shaving a tonsure on the head of a figure seated on a low bench. The sacrament of Holy Matrimony is usually depicted at that crucial point in the ceremony when the priest is joining the hands of the couple and blessing them. At Brooke we find a woman standing behind the bride holding in her arm a red veil, probably intended for the pall which was held over the newly-married pair from the Sanctus in the celebration of the Holy Eucharist until the conclusion of the nuptial benediction after the Paternoster. At Woodbridge the bridegroom is depicted as placing the ring on the thumb, forefinger, middle finger, and finally leaving it on the third finger of the bride, while the acolyte has partially closed the book, because the priest would say the words for the bridegroom to repeat in English. The eighth panel in these octagonal fonts is devoted to various subjects: the Crucifixion, Baptism of our Lord, the Last Judgment, the Assumption of the Virgin, &c. These fonts having representations of the seven sacraments upon them were made about the middle of the fifteenth century. The one at East Dereham was carved in A.D. 1468, and the church accounts state that it cost 12*l.* 13*s.* 9*d.*; but the one at Walsoken was a gift to that church in A.D. 1544. The women are represented in horned head-dresses on many of the fonts, showing that they were made about the period of Edward IV. The bridegroom in the panel for Matrimony at Badingham has a round turban cap of the date of about 1485, and at Great Glenham and Woodbridge the women appear in the butterfly headgear, so that these fonts may be dated about A.D. 1483. The Rev. H. Bedford Pim made some interesting remarks in the discussion on this paper.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The third meeting of the session was held on Wednesday, December 4, Dr. W. de Gray Birch, Hon. Treasurer, in the chair. A paper was read by Mr. A. R. Goddard upon "The Underground Strong-Room at Richborough," which was well illustrated by carefully drawn plans and conjectural sections of its possible construction. Notwithstanding the numerous explorations that have been made in the *Castrum Rutupiæ*, and all the theories suggested by antiquaries as to the reason for and the meaning and purpose of the vast work of masonry near the centre of the *Castrum*, discovered by Mr. Boys in 1792, it still preserves its secret intact; at once the hope and the despair of all who are interested in the Roman chapters of our national history. The recent explorations of Mr. Garstang have fixed the position of the missing wall of the *Castrum* to seaward, and have determined the area enclosed to have been about six acres; and near the middle of this enclosure is situated the remarkable vast platform of concrete, 145 ft. by 104 ft. and 5 ft. in thickness, with its super-imposed cross strips, the broader strips 47 ft. long by 22 ft. wide, about in a line with the Decuman Gate of the station, and the longer strip 87 ft., but only 7 ft. 6 in. wide at right angles to it. The thickness of these strips is 4 ft. 6 in., and they end abruptly, each at an equal distance of about 29 ft. from the edge of the platform. In 1822 the researches of Mr. Gleig revealed the fact that beneath this vast platform there existed a massive building, which he probed to a depth of 21 ft. from the underside of the platform, when water stopped his sinking further. This building is set far back from the outer edges of the platform to an extent of 10 ft. on the north and south sides and 12 ft. on the east and west sides, and thus it escaped the observation of Mr. Boys. In 1843 Mr. Rolfe excavated a passage, some 5 ft. in height and 3 ft. in width, round two sides and partly round the third side of this block, using the overhanging platform as a ceiling, and Mr. Dowker and the Rev. R. Drake in 1865 completed the passage and formed the underground gallery by which the four external sides of the building can now be explored. Mr. Goddard himself remeasured the block last October, and found it to be 126 ft. by 81 ft. What was the purpose of this singular building? Is it solid or is it hollow? No sign of any opening has as yet been discovered. Probing holes, with great labour, have been made in the walls to a depth of 20 ft. at various periods, but none have succeeded in penetrating any sealed enclosure, and the mystery remains unsolved. The platform is entirely covered with a rough coat of mortar 6 in. thick, thus effectually hiding any probable access from the top to any concealed chamber, and this mortar seems to have been intended to receive a marble pavement, as a small portion, *in situ*, was met with by Mr. Garstang. Mr. Goddard exhibited an enlarged drawing of the Castrum at Gamzigrad, from Kanitz's "Servia," which has much in common with the station at Richborough, and possesses a massive substructure nearly in the same relative position, very solid and conspicuous and still unexcavated. Having reviewed the various theories which have from time to time been set forth by antiquaries as to the purpose of this strange work, Mr. Goddard suggested two other possibilities of its use from the very necessities of the case; first, that it may have been for the storage of water for the use of the garrison and the fleets—a great piscina or reservoir, in fact, and he submitted a conjectural plan and section showing how the water could have been stored in various vaulted chambers, communicating with one another, similar to those at Fermos on the Adriatic, and near Baiae, and similar to such a piscina connected with one of the aqueducts near Rome, of which he showed a section. The second possibility is that it may have been the strong room of the station, its *Aerarium. Rutupiæ* was a very important centre, as the great point of connexion with Gaul. Some kind of strong room must have been needed for the bullion or moneys awaiting transport, and there is evidence also of a mint having been established at Rutupiæ. An interesting discussion took place, in which the chairman, Mr. Mill-Stephenson, Mr. Gould, Mr. Compton, and others, took part.

THE ROYAL ACADEMY PRIZE LIST.

THE following is the list of Royal Academy prize-winners in the Students' Competitions for this year :—

Historical Painting (Saul and the Witch of Endor —I. Samuel, xxviii. 7-14)—Gold medal and travelling studentship (200*l.*), George Murray; *proxime accessit*, Fred. Appleyard.

Landscape Painting (One of the Bridges over the Thames in London).—Turner Gold Medal and Scholarship (50*l*), Osmond Pittman.

Landscape Painting (Cumulous Clouds over a Fen Country).—Creswick Prize (30*l.*), Osmond Pittman.

Painting of a Figure from the Life (open to male students only).—Silver Medal—1st, Frank Samuel Eastman; 2nd, Jas. P. Sidney Streatfield.

Painting of a head from the life.—Silver medal, 1st, Gertrude Lindsay; 2nd, Frederick Dallas Barnes.

Painting of a draped figure (open to female students only).—Silver medal, 1st, Lizzie Hands; 2nd, Annie Margaret Page.

Cartoon of a draped figure (A Mourner).—Silver medal and prize (25*l.*), Elsie Gregory.

Design in monochrome for a figure picture (The Sacrifice of Manoah—Judges xiii., 19-20).—Armitage Prizes—1st (30*l.*) and bronze medal, Ernest Board; 2nd (10*l.*), Alfred William Sangster.

Design for the decoration of a portion of a public building (the Maske of Cupid—Spenser's Faërie Queene," book iii., canto 12, v. to xxvi.).—Prize (40*l.*), Frank Samuel Eastman; *proxime accessit*, William Ewart Gladstone Solomon.

Set of six drawings of a figure from the life (open to male students only).—1st prize (50*l.*) and silver medal, Walter Ernest Webster; 2nd (25*l.*), William George Simmonds; 3rd (15*l.*), Jas. P. Sidney Streatfield; 4th (10*l.*), Frederick George Swaish. (Mr. Streatfield and Mr. Swaish were disqualified owing to having received a superior prize in the same competition before).

Drawing of a head from the life.—Silver medal—1st, Walter Percy Day; 2nd, John Hodgson Lobley.

Drawing of a statue or a group.—Silver medal—1st, John Hodgson Lobley; 2nd, Arthur Bentley Connor.

Perspective drawing in outline (open to painters and sculptors only).—(The Entrance-hall of the Royal Academy).—Silver medal, Ada Gladys Fuller.

Composition in sculpture (Boadicea urging the Britons to avenge her outraged daughters).—Gold medal and travelling studentship (200*l.*), Stanley Nicholson Babb.

Model of a design (The Expulsion of Adam and Eve from Paradise). 1st (30*l.*), Frederic Charles Chrisfield; 2nd (10*l.*), Frank Ransom.

Set of four models from the life (open to male students only).—1st (50*l.*) and silver medal, Alexander James Leslie; 2nd (20*l.*), Arthur Charles White.

Design for a medal (In Commemoration of the Death of Queen Victoria, with a head of the Queen on the obverse).—Silver medal, George Gilbert Walker.

Model of a bust from the life (open to female students only).—No competition.

Model of a statue or group.—Silver medal—1st, Louis Richard Garbe; 2nd, Elsbeth C. P. Rommel.

Designs in architecture (A town hall for one of the new London Borough Councils).—Gold medal and travelling studentship (200*l.*), Bernard Hugh Webb.

Set of architectural drawings (The Trinity House).—Silver medal—1st, Charles Thomas Palmer; 2nd, Percy Ion Elton.

Set of architectural designs (Upper school).—Prize (25*l.*), Francis Winton Newman.

Set of drawings of an architectural design (Lower school).—Prize (10*l.*), Thomas Gerard Davidson.

Plan of a building (A casino and pleasure grounds on the borders of a lake). — Prize (10*l.*), Lionel Upperton Grace.

Original composition in ornament.—No competition.

Perspective drawing in outline (open to architects only) [Lord Burlington's villa at Chiswick (published in Kent)].—Silver medal, Alfred Charles Bossom.

The Landseer scholarships in painting and sculpture, of 40*l.* a year each, tenable for two years, have been awarded—in painting, to Frank Samuel Eastman, Alfred William Sangster, and Frederick Dallas Barnes (extra); in sculpture, to Charles James Pibworth and Frank Ransom.

THE ART UNION OF LONDON.—The Art Union have produced for their presentation plate this year an etching by Mr. W. L. Wyllie of his large picture of the naval funeral procession of the late Queen, which was exhibited at the last Royal Academy. The etching is a fine reproduction of the picture, though, like all the Art Union's plates, it is of an unnecessary and inconvenient size.

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APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Norwood †—Three houses, with shops on the ground floor, on the west side of Knight's Hill-road, Norwood, at the corner of St. Julian's Farm-road (Mr. H. Blackbourn).—Consent.

Hampstead.—A timber-framed porch to a house in course of erection on the south-west side of Kidderpore-avenue, Hampstead (Mr. W. A. Burr for Mr. G. Estcourt).—Consent.

Deptford.—A one-story addition in front of a factory building at Crown Wharf, Grove-street, Deptford (Mr. A. G. Scott for Messrs. A. G. Scott & Co., Ltd.).—Refused.

Width of Way.

Norwood.—A one-story coachhouse and stable on the west side of Knight's Hill-mews, West Norwood (Mr. F. G. Baxendale for Mr. Agate).—Consent.

Formation of Streets.

Lewisham.—That an order be issued to Mr. A. W. Osborn, sanctioning the formation or laying out of two new streets for carriage traffic in continuation of Staplehurst-road and Fernbrook-road, Manor Park, Lee (for Messrs. Johnson & Aldridge).—Agreed.

Lewisham.—A deviation from the plan sanctioned for the formation of new streets for carriage traffic out of Laleham-road, Catford, on the site of the Catford sports ground, so far as relates to the position of the street to be named Engleheart-road, in continuation (Messrs. H. and G. Taylor).—Consent.

St. Pancras, North.—A deviation from the plan sanctioned for the formation of a new street for carriage traffic to lead from Highgate-road to Gordon House-road, St. Pancras, so far as relates to the position of the northern portion of such street (Messrs. Boehmer & Gibbs for Mr. A. W. Armstrong).—Consent.

Formation of Street, Space at Rear, and Height of Buildings.

Hampstead.—That an order be issued to Messrs. Palgrave & Co., sanctioning the formation or laying-out of a carriage-drive on the west side of West End-lane, Hampstead, and the erection on one side of such drive of four blocks of residential flats to exceed in height the width of such drive and with irregular open spaces at the rear of two of the blocks (Messrs. H. Reeves & Co.).—Consent.

The recommendation marked † is contrary to the views of the Local Authority.

Correspondence.

To the Editor of THE BUILDER.

"QUESTIONS" IN COMPETITIONS.

SIR,—Will you kindly favour us with space to draw attention to a matter which deserves the serious consideration of the profession generally, and particularly of those members of it whose practice includes competitive work. The conduct of competitions has often formed the subject of comment in your columns, but we do not remember that the point we have in mind has been discussed.

We refer to the opportunity frequently given to competitors to question the promoters upon points not made clear in the conditions issued. So long as questions are confined to this, the legitimate object of the arrangement, perhaps no harm is done, and there is probably no better way of clearing up doubts and ambiguities due to the loose way in which the conditions are frequently drawn up.

But the matter does not end there. In more than one instance recently the opportunity has been taken advantage of by some (whom the nature of the questions asked clearly shows to have been quite incapable of dealing with the design in question at all) to obtain *advice* upon the disposition of the plan, character of the elevations, and other points upon which each competitor should be left to exercise his discretion. The advantage to which the experience of capable architects entitles them is thus extended to all competitors alike, and ceases to be an advantage.

One competition now in process of being carried out furnishes a case in point. In answer to the promoter's invitation one hundred and thirty-seven questions were submitted for the decision of the assessor. Advice and information were solicited upon every conceivable problem presented by the design, and with the utmost courtesy and impartiality the assessor placed his experienced opinion at the disposal of all alike, in fact rendered it almost unnecessary for competitors to think for themselves at all.

We may, in passing, say that so well were the conditions drawn up in this case, that we ourselves did not find it necessary to ask a single question; and the sole point on which our plans were affected by the replies to queries involved a definite and distinct breach of the original conditions.

The net result of this convenient arrangement has in this instance been the waste of nearly two months out of the period allowed for completion, and the complete rearrangement of the plans of some who were quite content to adhere to the original conditions.

We hold the opinion very strongly that assessors should either not invite questions at all, or should confine themselves strictly to elucidating points upon which the wording of the conditions admits of more than one interpretation.

We should be glad to hear the opinions of others upon the subject.

We enclose our name, but, as interested parties, prefer for the present to remain INCOGNITO.

*** We quite agree with our correspondent in his general position. An assessor ought to decline to admit frivolous and unnecessary questions, or such as argue professional ignorance on the part of the questioners. Questions should, in short, be confined to the object of understanding fully the requirements of the promoters of the competition.—ED.

"THE DIRECT EMPLOYMENT OF LABOUR."

SIR,—In view of the immense increase in cost of all building operations during the last few years, it is not to be wondered at that people are casting about in their minds as to the best means of reducing it; nor that the possibility of doing work "without the intervention of a contractor," as the L.C.C. loves to phrase it, should be one of the more plausible advocated.

It is not surprising that "One from the Bench" should be found among these. The British workman dearly loves a "soft" job, and, as a rule, there is no softer billet than one under a County Council, in some Government establishment, or with some rich brewery or landed proprietor. As recent illustrations of this I can call to mind from my own observations the spectacle of five men working a steam-hammer, four of them with pipes in their mouths; five men with a ganger using strenuous efforts to haul an empty 10-gallon oil-drum out of a dock; twenty-seven men in a fitting shop, only two of whom were making any pretence at doing anything; a timber shed erected by a brewer the labour alone on which cost 3s. per cubic foot; a piece of boundary wall built by a gas company which cost for labour only 10*l.* per rod, &c.

I am, however, a little surprised to find Mr. Blashill seemingly advocating the same theory. One would have thought he would have had more insight into the practical aspect of the matter. Some time ago, you will remember, there was a great outcry against the "middleman," who was supposed to interpose between the manufacturer and the consumer, and pocket the whole of the profits. Seeing, however, that he fulfilled the not altogether useless purpose of taking goods from places where they were not wanted and placing them where they were, he has been permitted to survive, and I have no doubt the contractor will, as Mr. Blashill puts it, be in evidence for some little time to come, if only because he possesses the one thing absolutely essential to the successful carrying out of any enterprise—experience.

It seems very remarkable to me, who have been in the business since my school days, and still find constant occasion to deplore my lack of experience and foresight, how lightly this is esteemed by architects, journalists, county councillors, and others. They seem to argue thus: You have a building to put up; all that is necessary is to engage a foreman or clerk of works, give him carte-blanche as to plant, materials, and money, and the building will find itself erected. And so it will, but at what cost? I am convinced, and act upon the conviction in my own business, that there is no getting away from the fact that work of whatever description is most economically and efficiently performed by those whose lives and energies have been systematically devoted to the particular description of work required to be done, and that any departure from this rule is most unlikely to result in saving.

When the L.C.C. Works Department was started, the Radical journals informed their confiding readers that a saving of 25 per cent. was the least that would be effected. Their tone nowadays is rather apologetic than otherwise. As a matter of fact, I suppose any contractor who clears a net 5 per cent. on the balance of his good and bad jobs is well satisfied. I have seen it stated that the profits of the late Mr. Brassey averaged no more than 3½ per cent., and surely the services rendered by a contractor, the advantages derived from his experience, and discernment in the selection, organisation, and management of men; provision of ample and suitable plant; foresight; knowledge of prices and value of labour, are well worthy this moderate remuneration. The building owner or his architect, lacking this experience, are as little fitted to carry out a building operation of any size as an amateur yachtsman—however clever a navigator—to command the Channel Fleet.

Nor does it follow that one result of dispensing with the contractor will be more satisfactory work. I have noticed that architects are less stern in dealing with the building owner than with builders. I know of one building erected with bricks no builder would have been permitted to use. This, of course, was in opposition to the wishes of the architect, but shows that they—the architects—do not feel themselves so freehanded in dealing with the one as the other. Per contra, on the same job, the very best joiners' deals were being used as scaffolding.

No, Sir, the remedy is rather to be looked for in the direction indicated by the writer of the articles in the *Times*, which, I am glad to see, are causing some amount of stir. I fancy the object of your correspondents "Mondamin" and "Provincial" is rather to confuse the issue. No builder would complain if he got an "average" of 400 bricks per day, including labours. The complaint is that this number is not approached in common work, by which, as I take it, your correspondents know well enough, is meant work without face in walls 14 in. thick and upwards. My own experience is that when the job is situated in a district where the Union is non-existent practically twice the amount of work is actually done as in towns where the Union is powerful. WM. F. WALLIS.

Maidstone.

SIR,—Referring to the letter of Mr. Thos. Blashill appearing in your last issue on the above subject, there are a few points upon which I venture to think contractors as a body would like to be enlightened, *i.e.* :—

1. "The contractor may, if he likes, have his yard and workshops, his dead stock and live stock, his machinery and the clerical staff of a large manufacturing establishment; he probably will keep up this system more or less. But it is no more necessary than it is for a joiner to have the old-fashioned box of tools."

2. "There is the saving of the contractor's profit, of his heavy payments for interest."

3. "The owner with money in hand can buy as well as—indeed, I have been told, better than—the contractor who takes even the shortest credit."

4. "He may not unreasonably hope to come out of the business better than he would do if it had been done by contract."

Now, with regard to paragraph

1. I venture to suggest that without his machinery, workshops, &c., the poor contractor would very soon find his business on the decline, and it does not follow that because advertisements for "ready-made joinery, &c.," appear in great variety the various workmen would be content to "simply fix it on the building." I know of cases where a contractor has tried the experiment with disastrous results; the workmen and their leaders are not fond of "imported goods," as they are pleased to call them. Have there not been many cases of friction between contractors and employees over "worked York stone" being sent into London for the London mason to "fix only?"

Again, I maintain that at no time has there been greater necessity for an efficient (owing to the ever-increasing difficulties the contractor has to contend with) and large clerical staff in his office than the present.

2. I challenge this statement; it is the old story, but proofs are wanting. There may have been individual cases of saving, but, on the whole, facts point to the contrary being the case.

3. Is there not some misunderstanding here? Surely a merchant is unlikely to supply a "casual buyer" at lower prices than a "regular one."

4. My opinion is that were one told this by a friend and tried the experiment of "direct employment," the result of experience so gained would mean that "coolness might possibly exist between them ever after."

With the greater part of the latter two paragraphs in Mr. Blashill's letter a good many will no doubt agree; still it does occur to me, "Do not people enter into contracts to save money?" If such is not the case, why obtain so many tenders? Is not the main idea generally of so much competition to obtain the lowest possible figure?

GEORGE H. CHAPPELL.

BOOKS RECEIVED.

THE ROCK TOMBS OF SHEIK SAID (Archæological Survey of Egypt). By N. de G. Davies. (Kegan Paul & Co.)

THE ART OF BUILDING (Weale's Series). By Edward Dobson. Fifteenth edition. Revised by T. P. Allen. (Crosby Lockwood & Son.)

WOHNHÄUSER. Von K. Weissbach. (A. Kröner, Stuttgart.)

THE LAW RELATING TO FACTORIES AND WORKSHOPS. By William Bowstead. (Sweet & Maxwell.)

MANCHESTER FIRE STATION COMPETITION.—In the plates of the First Premiated design for the above, published in our last issue, the architects' names should have been given as "Messrs. Woodhouse & Willoughby and John Langham," instead of "Messrs. Woodhouse & Willoughby" only.

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Illustrations.

DESIGN FOR A MEMORIAL TO BRITISH HEROES.

THIS design was the outcome of a suggestion made a few months ago by a daily paper that the nation should subscribe and erect a memorial to our soldiers lost in the war. A Classic design was submitted by me to the Editor, but, owing doubtless to the death of the late Queen, and other matters probably, the scheme is still in abeyance.

This, my second design, consists of a very lofty tower and spire, with a great hall on the ground floor, 100 ft. square, surrounded by smaller chapels, vestibules and ante-chambers, &c. The central tower stands upon the walls of the great hall, and contains a continuous spiral of steps, arranged in flights of six or seven risers, low and broad, with a landing 15 ft. square to each flight. On (and in) the walls all round would be built the monuments and tablets to the memory of our great and worthy dead—scientific, artistic, literary, musical, and naval and military heroes.

The stairway would be supported on each side by an arcade of marble columns and arches, and would be clear of the walls about 3 ft., which space would be arched over at convenient corners for constructional purposes. There would be left in the centre a space of about 50 ft. square, tapering up with the batter of the walls. In a large chamber at the top of the tower, about 340 ft. from the ground, would hang a peal of bells, with one large one for tolling. Outside galleries and corridors would be arranged at the base of the spire, among the pinnacles.

In the chapels below, of which there are eight, burial and memorial services would be held when required. A large organ would be built in the central hall, where the public would be admitted. They could also ascend into the spire, by lifts and staircases, to the topmost stone, which is 550 ft. from the ground. This stone would be hollowed to sufficient capacity to hold four or five persons, with windows or openings all round, from which a magnificent view could be obtained.

The site is, of course, a matter for consideration. I have had in my mind the square enclosed grass plots on the north side of Westminster Abbey; but as good or better might be found in one of the parks. Of the cost it is very difficult, if not impossible, to speak. Many smaller schemes might be added to the interior, which would increase the amount. For instance, a record-room could be arranged beneath the hall. Sacred concerts might be held in the hall, with a little modification of the plan; and rooms for public use, museums, libraries, &c., might be added, if thought fit. Fountains for display and drinking would be arranged outside, and small trees, shrubs, and seats laid out where the architectural features of the building would allow.

E. B. LAMB.

MANCHESTER FIRE STATION COMPETITION.

SECOND PREMIATED DESIGN.

WE give this week the elevations and the two principal plans of the design by Mr. George Watson, of Edinburgh, which received the second premium in the competition for the new Fire Station at Manchester.

We commented at some length on the design in the review of the competition in our issue of November 30, to which we may refer our readers.

SKETCHES FOR HOUSE INTERIORS.

THESE sketches for interiors are by Messrs. Parker and Unwin, whose book on "The Art of Building a House" was recently noticed in our columns.

The sketches were made partly to try the effect of a room before finally completing the plan of the house; and the architects suggest that such a method may often be very usefully employed in order to realise better the effect which the plan of a room will have. In some cases their plans have been modified as the result of such sketches. This seems a good suggestion, worth consideration in working out the design of a house.

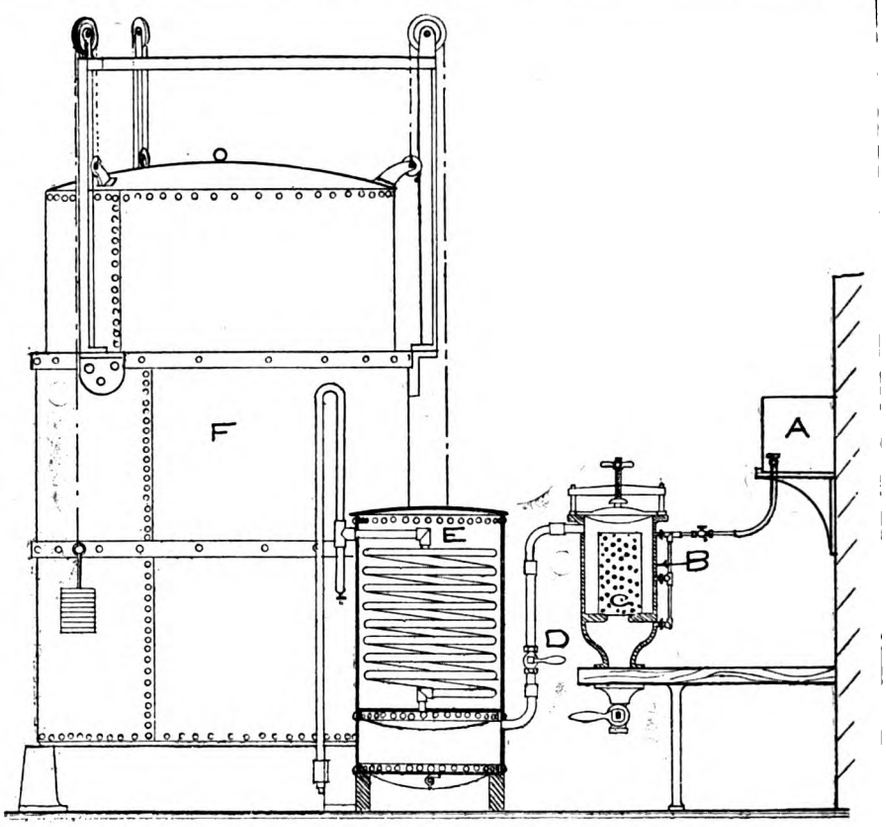

Fig. 56.—Non-Automatic Water-to-Carbide Generator.

COMPETITIONS.

CAMBERWELL PUBLIC BATHS.—These baths are to be erected in Old Kent-road, and will comprise two swimming-baths, 130 warm baths, a Turkish bath, and a public wash-house with fifty compartments. The competition was open to the profession generally, Mr. A. Saxon Snell being appointed as assessor. Fifty-two designs were received early in October. The assessor's award (which has been adopted by the Council) is as follows, viz.:—First premium, No. 18, Mr. Harding Payne; second premium, No. 7, Messrs. S. B. Russell and C. E. Mallows; third premium, No. 32, Mr. Dighton Pearson. Mr. Harding Payne has been appointed architect to the building, which is estimated to cost 50,000*l*. The whole of the designs will be on exhibition at the Camberwell Public Baths, Church-street, Camberwell Green, S.E., up to and including Wednesday next.

The Student's Column.

GAS AND GAS-FITTINGS.

23.—SOME ACETYLENE GENERATORS.

ACETYLENE generators may be divided into two classes:—

1. Non-automatic generators;
2. Automatic generators.

In the first class a gas-holder is provided of sufficient capacity to contain all the gas which can be evolved from the largest charge of carbide which can be placed in the generator; whilst in the second class the rate of generation is dependent upon the rate of consumption, the gas-holder is not usually of sufficient capacity to contain all the gas generated from a charge of carbide, and the supply of water to the carbide, or carbide to water, is automatically stopped when the gas is generated at a more rapid rate than that at which it is being consumed.

During the last six years several hundred forms of apparatus for generating acetylene by the action of water upon carbide, or carbide upon water, have been patented. Of these only a small proportion are now on the market, but the number of survivors is nevertheless too large to admit of a description of each in these columns. A description of four of the different forms of generators in general use at the present time must suffice to illustrate the general principles of generator construction. Of these the first two are non-automatic, and the last two are automatic generators. In some forms of generator the carbide has to be used in a granulated condition, but as granulated carbide seldom yields so large a volume of acetylene as lump carbide, owing to the loss of gas which occurs when the carbide is crushed and stored, these generators are not, as a rule, economical.

The advantages of non-automatic generators over those of the automatic description are greater simplicity and safety, but they have the disadvantages of being more costly owing to the necessity of providing a gasholder of comparatively large capacity, and of occupying a larger area of ground. When cost is not a primary consideration, non-automatic generators are, in the opinion of the writer, preferable to those of automatic form; but it is an indisputable fact that many automatic generators of a simple description are in operation in many parts of the country and are giving complete satisfaction to their owners.

When selecting a generator, attention should be given to the following points:—

i. Excessive heating should not occur during the decomposition of the carbide. The lime sludge left after decomposition should not contain yellow compounds, tarry matter, or soot.

ii. The air space in the generating chamber should be as small as possible, in order to prevent the formation of an explosive mixture of acetylene and air when gas is first generated after recharging.

iii. No undecomposed carbide should be found in the generator when it is cleaned out.

iv. All parts of the apparatus should be well constructed in strong and durable material. Generators constructed with old salmon tins by amateur mechanics are liable to lead to disaster. Brass pipes or apparatus should be avoided, but stopcocks of brass may be used.

v. Not less than 4½ cubic feet of gas should be obtained from every pound of good commercial carbide placed in the generator.

vi. The gas pressure within the generator should at no time exceed 12 in. of water.

Non-Automatic Generators.—The generating apparatus known as "The Ideal" (fig. 56) may be regarded as a type of the simplest and safest class of generators. It is non-automatic, since the admission of water to the carbide is regulated by the manual operation of a cock, and the generator is connected to a gasholder of sufficient capacity to contain all the gas which can be generated from a maximum charge of carbide.

Water from the tank (A) is admitted to the generator (B), in which is situated a perforated basket (C) partially filled with carbide. The basket is introduced into or removed from the

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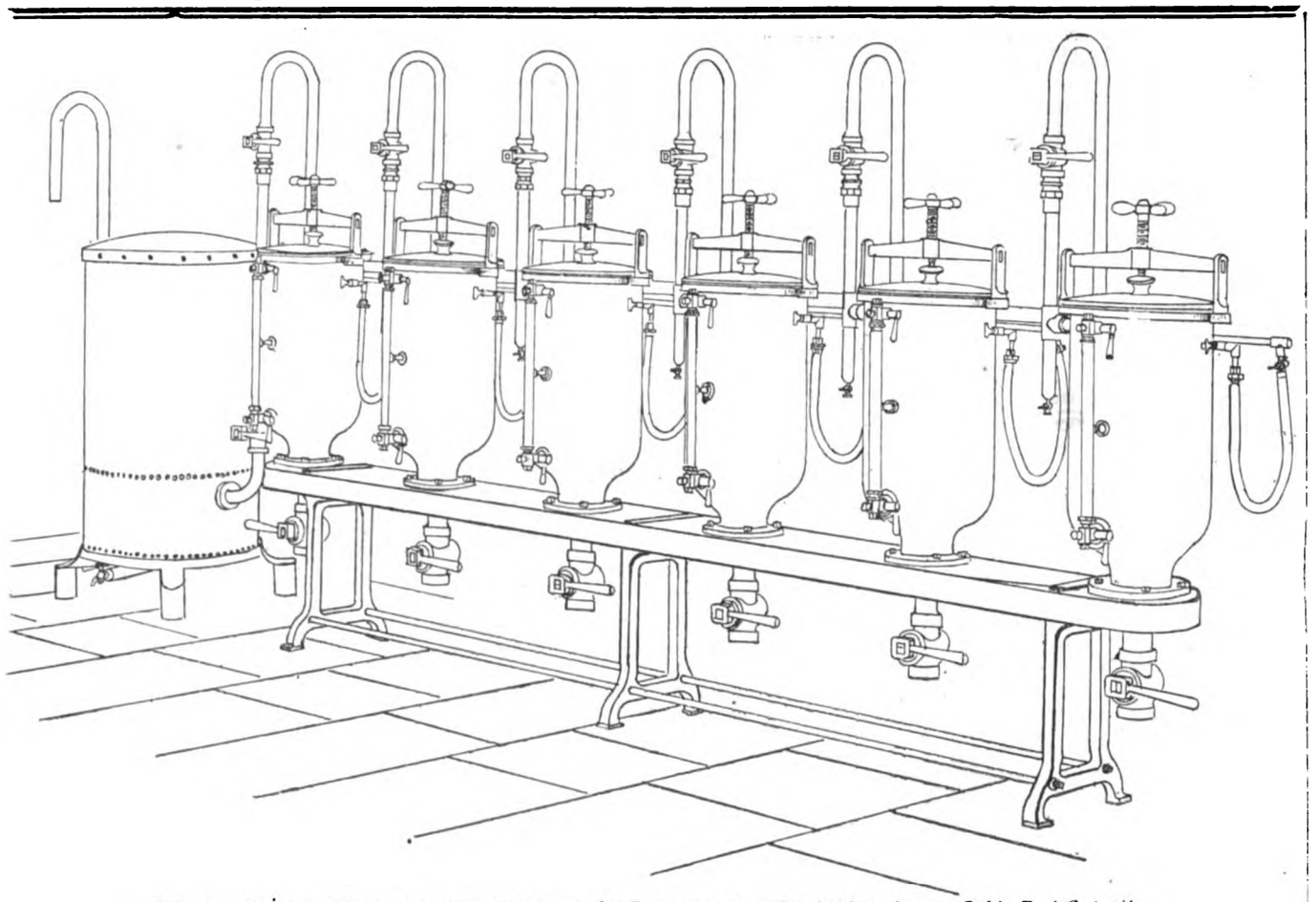

Fig. 57.—Battery of Generators with Condenser for Connexion to a Gas-holder of 4,000 Cubic Feet Capacity.

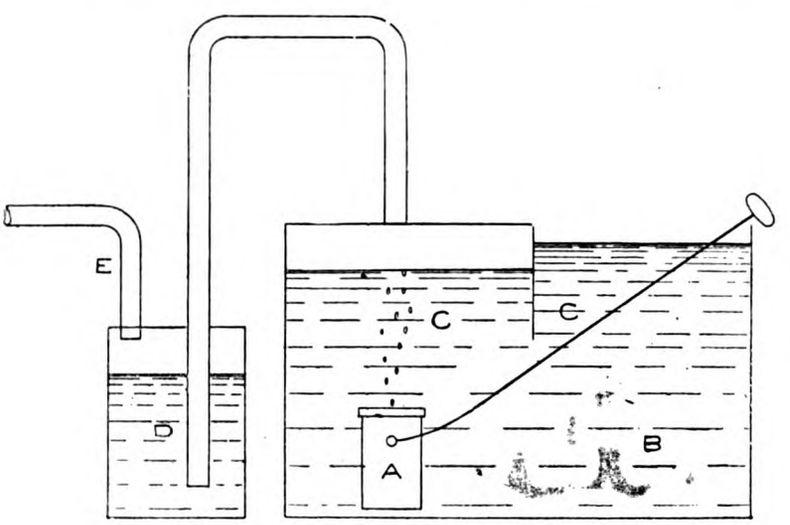

Fig. 58.—Non-Automatic Carbide-to-Water Generator.

generator by taking off the cover, which is held in position by a screw and cross-piece as shown in the illustration. The water slowly rises within the generator, and soon comes in contact with the lower portion of the carbide. Acetylene gas is immediately generated, and passes through a condensing coil (E), from which condensed water is from time to time drawn off. From the condenser the gas passes into the gas-holder (F), or may be passed first through a purifier and then into the gas-holder. When the carbide basket is completely flooded with water, and gas ceases to be evolved, the water-supply cock and the cock (D) between the condenser and the generator are closed, the sludge in the generator is removed by opening the lever cock at the base, the carbide basket is removed and its contents discharged, and the apparatus is then ready to be re-charged.

The water-tank is only slightly raised above the generator, and the gas outlet pipe from the generator is carried up higher than the top of the tank, so that it is impossible for the water to flow over into the condenser. The pipe which admits water into the generator is of very small bore, so that water cannot flow into the generator very rapidly, and in the event of any obstruction occurring in the outlet pipe from the generator the pressure of the gas within the generator drives back the water from the carbide before the pressure has become considerable.

The illustration (fig. 56) shows a plant intended to supply sixteen acetylene flames, each consuming ½ cubic foot per hour, for a period of five hours without refilling the holder.

When the quantity of acetylene to be manufactured is large, a number of these small generators are connected in the form of a battery to one large gasholder (fig. 57).

This is preferable to making one large generator to contain all the carbide to be decomposed, because in decomposing a large bulk of carbide in this manner the heat accumulated within the generator during the period of decomposition is apt to be excessive. The generators are sometimes provided with water-jackets, but this is quite unnecessary, since no harm is done if the temperature of the generator does not rise above that which the hand can bear without discomfort, and there is no difficulty in decomposing the whole of the carbide without exceeding this temperature if the flow of water to the carbide is stopped when necessary. The battery of generators shown in fig. 57 is connected to a suitable condenser, and is adapted to fill a holder of 4,000 cubic feet capacity.

Another form of non-automatic generator is that manufactured by the British Pure Acetylene Gas Syndicate (fig. 58). This apparatus also has the merit of extreme simplicity. The carbide is placed in an iron pot (A) having a lid with a central perforation. This is plunged through a tank (B), which is open to the air, into a water chamber (C) which is closed (by C1) from the open air. The water slowly enters the carbide pot through the perforation, and the gas generated bubbles up through the water, and passes through a washer (D), and from thence passes through a pipe (E) to a gas-holder. When employing an apparatus of this type, a certain proportion of acetylene is lost owing to its solubility in water, and the water soon emits a disagreeable odour owing to the solubility of sulphuretted hydrogen, ammonia, and other impurities in the water. The foulness of the water is not, however, a matter of importance when the generator is situated at some distance from the dwelling supplied with acetylene, and the fact that the water removes a considerable proportion of the impurities from the gas is some compensation for the loss of acetylene which occurs.

Automatic Generators.—In Strode's "Simplicity" generator (fig. 59), which is manufactured for installations not exceeding twenty lights, water rises to carbide, the supply of water to the carbide being automatically controlled by the rise and fall of the bell of the gasholder. In the illustration, A is the gas-holder tank, B is a tapered gas bell, C the lip for filling the tank with water, D a cylinder for holding the carbide container, E the carbide container attached to D by a bayonet joint F are trays in which the carbide is placed, G is the gas outlet pipe, H the lid for introducing or removing the carbide container, and J is a trap for condensed water.

Each tray is half filled with carbide and placed in the generator. When the generator cover has been closed, the gasholder tank is slowly filled with water until sufficient gas has been generated to cause the gas bell to rise about 6 in. More water is then added until the water level mark is reached. The apparatus will then work without attention

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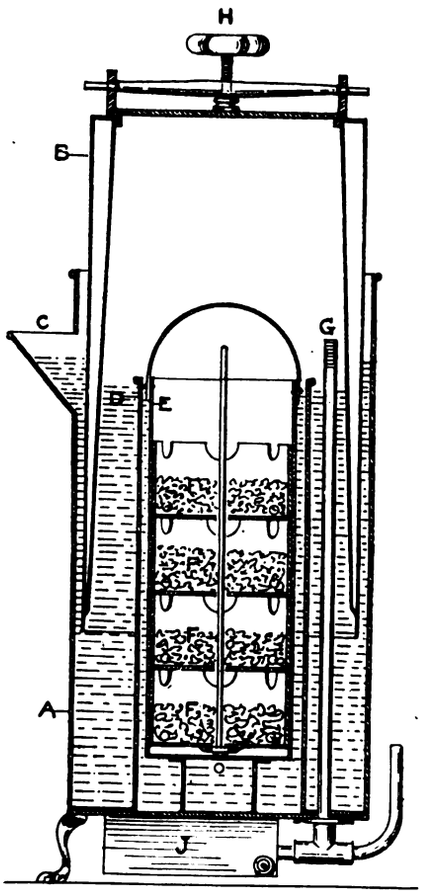

Fig. 59.—Automatic Water-to-Carbide Generator.

in consequence lowered, and water ceases to flow into the generating chamber; while if the consumption is more rapid than the generation the bell descends, and, owing to its tapered form causes the displacement of a comparatively large volume of water which flows over into the generating chamber and increases the rate of decomposition of the carbide.

Strode's "Perfect" (fig. 60) generator is another form of automatic generator, but in this case the carbide is dropped into a large volume of water, instead of water being allowed to rise around the carbide. The carbide container (C) is situated above a revolving cone having a spiral chamber into which the carbide falls by its own gravity. The cone is actuated by a water-wheel (D) which discharges carbide into a wire-gauze chamber or strainer (F), which is immersed in the water contained in the generator-tank.

When water is discharged into one of the pockets of the water-wheel until the pocket is filled, the wheel turns a quarter revolution. The discharge of water into the pocket is regulated by the rise and fall of a tapered gasholder bell (M), the walls of which displace the water in the gasholder-tank when the bell descends, and causes it to overflow and be discharged upon the wheel. The water employed to actuate the wheel falls subsequently into the generator-tank (I), which is provided with a suitable overflow.

In order to maintain the necessary quantity of water in the gasholder tank, a water regulating tank fitted with double ball-valves and an overflow, and connected with the water main, is provided. A box-shaped cover (B) slips over the carbide container and water-wheel, and dips some distance into the water, thus forming a gas-tight seal. The container can be charged with carbide by removing the cap (A), water is conveyed from the gasholder tank and discharged over the wheel through the pipe (G), the gas produced passes from the generator to the gasholder through the pipe H.

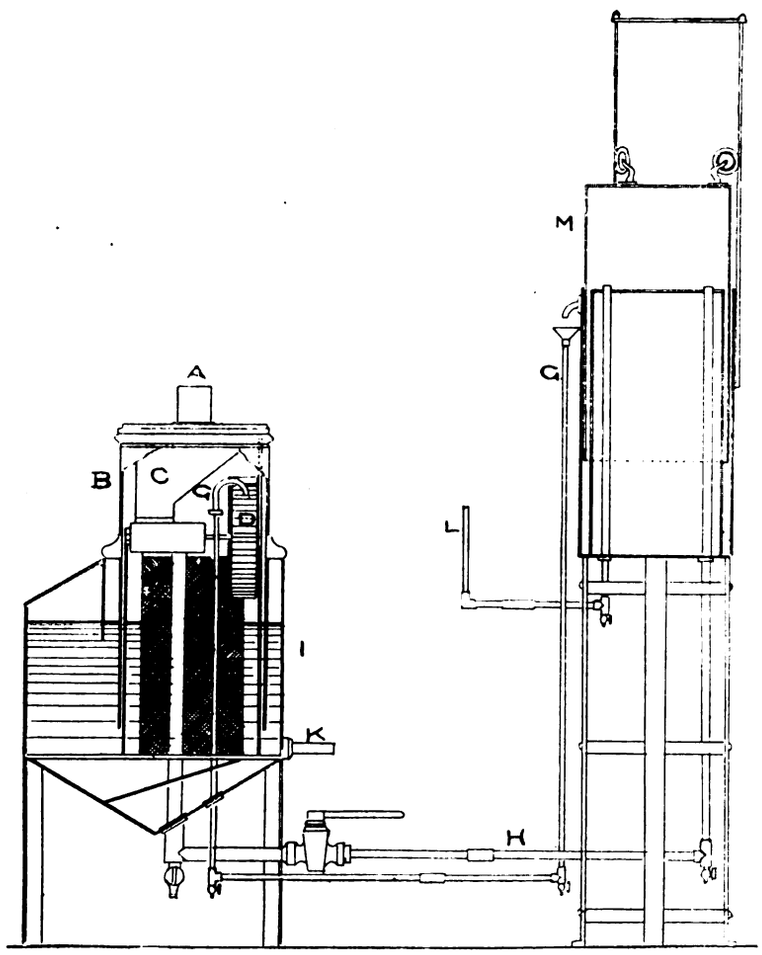

Fig. 60.—Automatic Carbide-to-Water Generator.

until the whole of the carbide has been decomposed, because when the gas is generated at a faster rate than it is consumed the bell rises and the water level in the tank is while K is the pi e employed for filling the generator tank w h water, and L the pipe which conducts the acetylene from the gasholder to the burners.

Location of Generators.—Acetylene generators should never be fitted in the basement or any other part of a dwelling, for the operation of cleaning and recharging is always accompanied by the evolution of a disagreeable odour, which is so penetrating that it soon becomes disseminated through the whole building. The generator should be situated in a detached building, and should never be exposed to the action of frost, as the freezing of the water in the gasholder tank or supply cistern would put the apparatus out of action. The carbide may be stored in the generator house on platforms or shelves raised above the floor level, so that if a bucket of water is accidentally upset the water cannot come in contact with the vessels in which the carbide is stored. The generator should be charged in daylight, and no flames should be allowed in the generator house.

The waste sludge should never be passed directly into a sewer, but should be discharged into an open intercepting pit, so that the evolution of gas from any portion of the carbide which may have escaped decomposition in the generator cannot result in the formation of an explosive mixture in a confined space.

OBITUARY.

MR. INNOCENT.—We regret to announce the death on November 30, at his residence, No. 18, Wellesley-road, of Mr. Charles John Innocent, of No. 22, High-street, Sheffield, in his sixty-third year. Mr. Innocent became an Associate of the Royal Institute of British Architects in 1865; he was elected Fellow in 1889, and for some period was member of the Council. He was a Fellow of the Surveyors' Institution, and had served as President of the Sheffield Society of Architects and Surveyors. He formerly practised in co-partnership with Mr. Thomas Brown, who had been his brother-pupil in the offices of Messrs. Hatfield, Son, & Garland, successors to the late firm of Weightman, Hatfield,, & Goldie—both of Sheffield. Together with his former partner, Mr. Innocent found and made his opportunity in the passing of W. E. Forster's Elementary Education Act of 1870; they were the architects of a large number of public elementary schools in Sheffield and around, and in 1874 they published a volume, "Illustrations of Public Elementary Schools," containing drawings of schools designed by them. Amongst Mr. Innocent's architectural works we may instance the following:—Sunday schools, with other buildings, at Carbrook, Sheffield (1887); superintendent's house, offices, probationary home, cottage homes, and children's hospital upon the Goddard Hall estate, at Crabtree, for the Union Guardians, Sheffield (1893-4); alterations and enlargement of the Gleadless-road Schools, Heeley, with a new girls' department and separate cookery and manual instruction departments—opened on February 6, 1899—for the Sheffield School Board; additions and improvements, with two large assembly-rooms for the young men's and young women's institutes, classroom, infants' schoolroom with gallery, &c., at St. John-street Methodist Church, Sheffield (1897); a Methodist church at the corner of Fulwood-road and Nether Green-road, Ranmoor, begun in October of last year; and a Methodist church and schools at Nether Green, for the Sheffield New Connexion. In August, 1894, Mr. Innocent was awarded the second premium for his plans and designs, out of fourteen sets submitted, for the Tinsley Park-road Board Schools. Only a few days before his death he had taken his son, Mr. C. Francis Innocent, into partnership. We may add that Mr. Innocent had been from an early period an enthusiastic member of the local auxiliary forces, and more than forty years ago, with some of his fellow-students at the Sheffield School of Art, took an active share in the establishment of the Engineer Volunteer Corps.

GENERAL BUILDING NEWS.

EMMANUEL CHURCH, SPARKBROOK, BIRMINGHAM.—The growth of population in Christ Church parish, Sparkbrook, has necessitated the erection of a chapel of ease at the corner of Walford and Golden Hillock roads, on a site presented by the trustees of the Birmingham Churches Fund, and on the 23rd ult. the edifice, which is named Emmanuel Church, was consecrated. The church, which is in the Decorated style, has been built by Messrs. Moffatt & Son, of Camp Hill, in accordance with plans prepared by Mr. W. Hawley Lloyd, architect, of Bennett's Hill, but the whole of the original scheme has not yet been carried out. The site is of sufficient extent to allow of the erection at a future time of other parochial buildings. The church is a brick erection, with stone dressings, and has a bell turret for the accommodation of three bells, and is surrounded by a minaret of stone. When completed the church will accommodate over 700 worshippers, but the present building, which consists of chancel, organ-chamber, vestry, chancel aisle, and two bays, the latter with traceried win-

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dows, will seat about 430 persons. The present cost is about 5,000*l.* At the east end there is a traceried window.

WESLEYAN CHAPEL AND SCHOOLS, WORCESTER.—A new Wesleyan chapel is being erected in Pump-street, Worcester. At the rear, on property acquired for the purpose, schools will be placed. The school buildings will include an assembly-room and five classrooms, vestries, and a lady's parlour. Beyond will be a yard for the boys and girls. The total outlay is estimated at 8,000*l.* The architect is Mr. Jameson Green, of Liverpool, and the contractors, Messrs. Hopkins & Son, of Birmingham.

REPAIRS, &C., ST. JOHN'S CHURCH, WOODBRIDGE.—St. John's Church, at Woodbridge, was reopened recently upon the completion of a scheme of internal improvement. With the exception of the gallery, the whole interior has been reseated. The new benches are in teak. The floor is laid with pitch-pine blocks, resting on cement concrete. The floor of the porch is tiled. Two cast-iron columns which supported the front of the organ have been removed, and an oak arching substituted, the heads of the bays being filled in with carved and cusped tracery. The stone pulpit has been lowered about 18 in., while the former small stone shafts of red stone are replaced with others of polished Connemara green marble. New leaded lights have been inserted in all the windows; the gas is now laid on—the church having been hitherto lighted by oil lamps—and the burners are on wrought-iron and polished brass standards and brackets; and an entrance to the vestry through the north end of the east wall, instead of from the apse, as before. The walls are distempered, and the apse is painted and decorated. The central window above the Holy Table contains the figure of a saint in stained glass. The architects were Messrs. Brown & Burgess, of Ipswich. The work at the church was executed by the following firms:—The benches and all joiners' work by Mr. W. T. Smith, of Woodbridge; the concrete, tile floor, and bricklayers' work by Mr. Barrell, of Woodbridge; stonework and alterations to pulpit, Mr. Watts, of Colchester; gas and decorative work, Messrs. Alfred Stearn & Son, of Ipswich; new windows in nave, Mr. H. J. Salisbury, of Brompton-road, London; gas standards, Messrs. Jones & Willis, London; carving on bench-ends, &c., by Mr. P. Groom, of Ipswich.

CONGREGATIONAL CHURCH, MATLOCK.—At Farley, a suburb of Matlock, on the 30th ult., the foundation-stone was laid of a Congregational church. The contract has been let to Mr. T. Needham, and there is to be provision made, not only for a church, but also for a schoolroom in the basement. Mr. A. E. Falding is the architect.

NEW CENTRAL POLICE-STATION, HULL.—At the Hull Town Hall, on the 3rd inst., an inquiry was held by Mr. E. A. Sandford Fawcett, A.M.Inst.C.E. (Local Government Board Inspector), into the application by the Hull Corporation to borrow 30,668*l.* for the provision of a new central police-station, and 5,430*l.* for the erection of stables, &c., at the Scarborough-street depot. There was no opposition to the application. Mr. Hirst, the City Architect, gave evidence to the effect that the plans had been approved by the Home Office. He described the building, and said the walls would be of brick, with stone dressings. The drainage would go into the main sewer in the new street. The Inspector then dealt with the application for the Scarborough-street stables. The Town Clerk stated that what were required were stables, waggon shed, and foreman's residence. The site on which the buildings were to be erected belonged to the Corporation, having been purchased for a refuse-destructor. The Corporation had taken up the collection of dry dust, and it became necessary for them to purchase horses and carts, and, fortunately, they had sufficient area for the stables. Originally 10,402 square yards of land were bought for the destructor. Mr. Hirst said that there would be accommodation for forty-seven horses.

Y.M.C.A. BUILDINGS, LEICESTER.—The formal opening of the new buildings of the Leicester Young Men's Christian Association took place on the 5th inst. The buildings, which stand on a site on the London-road, have been erected at a cost of about 35,000*l.* from the plans of Messrs. Draper, Walters, & Co., and Mr. A. E. Sawday. The main entrance is from the London-road. The entrance hall gives access to the principal staircase and the cycle-rooms through the area. On the first floor are newspaper-room, library, recreation-room, and refreshment-room, together with committee-room, President's parlour, and offices for the secretary and clerks. These are approached from the main corridor or from the lounge hall at the head of the staircase. Lavatory and cloakroom accommodation are also provided on this floor. The clubrooms, which face the London-road, are arranged *en suite*, so that they may be used for receptions and large gatherings of various kinds. On the second floor there is a large room to hold about 200, which can be used for lectures, classes, or for other meetings. There is a retiring-room in connexion with the above, having a separate approach from the hall. Two classrooms, capable of seating seventy and fifty respectively, are placed so that they may be used in connexion with the large meeting-room. The remainder of this floor is occupied by the residential parlour and five sitting or bedrooms for the use of members. The third floor contains seventeen bedrooms for residential members, in connexion with which bath and lavatory accommodation is provided. The administrative offices are placed on the second floor in the side portion facing East-street. These consist of a large kitchen, connected with the refreshment-room by service chairs and up and down dinner-lift, scullery, larder, &c., with parlours and bedrooms for the caretaker and servants. The Association hall, capable of seating about 750 people, is approached from the London-road and East-street, and made to be used either in connexion with the Y.M.C.A. or let for independent meetings. Two retiring and cloak rooms are arranged in connexion with the hall, and a small kitchen is arranged for the service of teas and light refreshments. In the basement there is a gymnasium 60 ft. by 45 ft., with dressing-rooms, &c., fitted up with shower and plunge baths. The principal rooms are heated by radiators supplied with hot water, but in addition to these open fireplaces are provided.

TOWN HALL, ILFORD.—This building, which is situate in the High-road, with a return frontage to Oakfield-road, has just been opened. At the opening ceremony Mr. B. Woollard, the architect, said the principle of the plan was the arrangement of the building into two sections, the business section and the Town Hall section, so that although one building, one section, when in use, would not clash with the other, when in use at the same time. For that reason two main entrances had been provided, one giving access to the Council offices, and the other to the Town Hall. The site had a frontage to the High-road of 115 ft. and to the Oakfield-road of 102 ft. The building, when complete, will have two symmetrical fronts, the Oakfield-road front being at present incomplete. The elevations are of Bath stone, with copper domes. The height of the parapet is 43 ft., and at the highest point the building is 86 ft. In the office portion, on the ground floor rooms are provided for rate collectors, surveyor, accountant, sanitary inspector, medical officer, road foreman and clerk of the works, who work in connexion with the surveyor and sanitary inspector. There are also two fireproof strong-rooms. On the floor above, approached by a stone staircase, are arranged the Council chamber, a room 40 ft. by 30 ft., two committee-rooms, a chairman's parlour, an ante-room, and a suite of offices for the Clerk of the Council. These rooms, and those on the ground floor, are all connected by means of speaking tubes. There is a secondary staircase at the rear of the Council chamber, for the use of the public attending the Council meetings, approached from the Oakfield-road, and communicating with the ground floor. There is a suite of rooms for the caretaker on the top floor, and a basement with heating chambers, &c., under a portion of the back part of the building. In the Town Hall portion there is a hall some 70 ft. by 57 ft., with a platform 33 ft. by 18 ft.; two retiring rooms on the same level, and three large rooms under. There is also a gallery 35 ft. by 22 ft. The main entrance is under this gallery, and has a cloakroom on either side. The seating accommodation is estimated at about 1,000. The platform has been raised some 5 ft. Four pairs of double doors at each end and an extra exit in the middle of the room have been provided, and all doors have special panic bolts. Special automatic fire alarms have been fitted up all over the building. The builders are Messrs. G. Sharpe, and the clerk of the works Mr. J. W. Thurlow.

FOREIGN.

FRANCE.—The Prefect of Police at Paris, M. Lépine, recently organised a competition among the makers of toys for Christmas and New Year's presents, with the view of encouraging them to endeavour to put more artistic style into such articles than is usually found. There has been an exhibition of the work of the competitors in the large hall of the Tribunal of Commerce, and many of the things shown are both ingenious and pretty. Some very eminent artists have even been induced to make designs; there is a monkey modelled by M. Frémiet; French and Russian soldiers by M. Detaille; a "Marchande de jouets" by M. Gérôme; figures of skaters by M. Coutan; and a "Japonaise" by M. Felix Régamy.——The Municipal Council of Paris are continuing the work on the underground railway, and a scheme for a new line is before Parliament. This will detach itself from the Vincennes line at the Palais Royal, and will follow the line of Avenue de l'Opéra, and of Rue Halévy, Rue Lafayette, Rue Chabrol, and Rue Strasbourg, and will pass under the Buttes Chaumont and terminate at the Place du Danube in the XIXth Arrondissement. The first cost will be nearly 19 million francs.——The Rue de Rennes, which now ends at the Place St. Germain de Près, is to be prolonged to the Seine, at a cost of 22 million francs. This will necessitate also the building of a new bridge over the Seine.——M. Moyaux has been elected President of the Société Centrale des Architectes Français for 1901-2.——The Prefect of the Seine has made it an order to the mayors of districts in the Department of the Seine that they are not to allow any monument of a historic or artistic character to be destroyed before the "Vieux Paris" Committee has been consulted in regard to it.——M. Carrière is just completing four large decorative pictures intended for the Mairie of the XIIth Arrondissement, the subjects being "Marriage," "Birth," "The Family," and "The Return from Labour."——The Société Moderne des Beaux-Arts has opened, at the Georges Petit gallery, an interesting exhibition including works by M. Victor Prouvé, by the Flemish painter M. Villaert, and by MM. Milcendeau and Rouault, two remarkably clever pupils of Gustave Moreau; also some sea pieces by M. Détroy and views of Paris by M. Houbron.——At Aubervilliers, on the 22nd, is to be opened a large new Salle des Fêtes, built from the designs of MM. Joanny Bernard and Robert.——The jury in the competition opened by the Municipality of Ivry for new school buildings, has awarded the first premium to M. Despeyroux, the second to M Emile Robert, and the third to MM. Marchi and Letrosne.——The Municipality of Royau is about to open a competition for a Casino and a Salle des Fêtes on the beach at Pontillac.——The annual fine art exhibition at Angers has just been opened.——The Municipality of Lyons intends to establish an underground railway system in that city.—M. Morvan, architect, St. Brieue, has been commissioned to build a new Hôtel de Ville at Loudéac (Côtes du Nord).—A competition is to be opened for the rebuilding of the museum at Nîmes.——Important restoration works are to be commenced at the old twelfth-century château of Laval.——A well-known amateur, the late M. Lutz, has left to the Louvre a curious picture by Boilly representing a gathering of artists at the studio of Isabey.

INDIA.—Plans and estimates have been prepared by the Military Works Department for a water-supply scheme for Neemuch.——New barracks and hospitals are about to be erected at Quetta, the Secretary of State having sanctioned the expenditure necessary.——The tenders submitted for building the new Municipal offices, Calcutta, vary so widely that, in order to institute a fair comparison between them, it has been found desirable to adopt a schedule of quantities, and apply the working rates in the case of each tender to ascertain the cost.——The "paying patients'" building of the Presidency General Hospital, Calcutta, is intended to be commenced during the present season.——The Southern India Railway Company propose to erect a large station in the Hindu style of architecture at Egmore terminus.

MISCELLANEOUS.

NO. 16, MAIDA VALE, W.—Mr. Alfred Gilbert, R.A. is about to dispose of his leasehold interest in the house, No. 16, Maida-vale, with the attached studio and workshops, which he designed and fitted for his own occupation. The property for sale includes the adjoining house, and covers a total area of nearly one acre, with a frontage to the main road.

THE STRAND IMPROVEMENT.—On the 6th inst., at the Guildhall, Westminster, Mr. John Troutbeck, sitting as High Bailiff, and a special jury had before them the case of "F. and F. J. Hazeldine (trustees of Little, deceased) *v.* the London County Council," it being a claim for compensation for the compulsory acquisition of the freehold premises No. 7, Windsor-court, Strand, required for the purpose of the new Strand to Holborn avenue. Mr. Edward Boyle, K.C., and Mr. W. C. Ryde were counsel for the claimants; and Mr. Freeman, K.C., represented the London County Council. Mr. Boyle said that the house, which had been let out in tenements, had a frontage to Windsor-court of 28 ft., and the property had been let for 65*l.* per annum. By expending about 100*l.*, however, his client could have increased its value as workshops to 100*l.* a year, and, inasmuch as the court was private property, he contended that cellars could have been constructed to produce at least 20*l.* per annum. His expert witnesses had capitalised those two sums at twenty years' purchase, which, with the 10 per cent. allowed for compulsory sale and after making the usual deductions, would yield 2,530*l.*, which was the amount he asked the jury to award. Mr. Douglas Young, F.S.I., and Mr. W. A. Ball, of Pall Mall East, gave evidence in support of Mr. Boyle's statement. Mr. J. F. Field, ex-President of the Auctioneers' Institution, gave evidence to a similar effect. Mr. Freeman submitted that the claim with regard to the cellar was a preposterous one, and that a little over 800*l.* would amply compensate the claimants. Mr. James Green, of Chancery-lane, gave evidence in support of these figures. The jury awarded the claimants 1,320*l.*, including everything.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—On the 6th inst. a paper was read by Mr. C. Ernest Monro, Vice-President, entitled "Hotel Planning and Construction." The question of site, aspect and prospect was discussed, and following this the position on plan and the general treating of the various public rooms, was illustrated. Among these the coffee-room was important, and should possibly have bay windows, ceiling of good height, say 14 ft., the floor of parquetry, and musicians' gallery provided if desired. The lounge should be situated conveniently to the coffee-room, and designed in a sumptuous if not luxuriant manner. The drawing-room also should be easy of access from the coffee-room and have a good outlook. The lecturer recommended the use of double sashes

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to these rooms, as also to the reading and writing rooms, to ensure the exclusion of outside sounds. The matter of prospect was also to be considered regarding the bedrooms, as good outlook is desirable to these. The various other rooms, including kitchen, servery, and offices, with the sanitary treatment necessary, were each in turn treated of, and the lecture was illustrated by means of plans of several of these buildings erected in Scotland.

NORTHAMPTON CHURCH EXTENSION SOCIETY.—The Restoration Committee of the Church Extension Society for the Archdeaconries of Northampton and Oldham met at the Society's rooms in Sheep-street, Northampton, on Monday morning, the Rev. A. W. Pulteney presiding, and an application was received asking for assistance in the restoration of Chipping Warden Church, and it was decided to make a grant of 25*l.* for this purpose.

APPOINTMENT OF SANITARY OFFICER.—The Local Government Board has sanctioned the appointment of Mr. W. Tedham as a sanitary inspector in the Metropolitan Borough of Woolwich.

RECORD BUILDING WORK.—All records in building have just been broken in New York. The entire steel framework of a fifteen-story office building has just been erected at 68, William-street. The work was accomplished in twenty-five days. On November 9 the old building occupying the site was removed and the ground cleared. A huge steel skeleton was then erected, and is now ready for the stone and brick work. The building will be fully completed in six weeks from Dec. 6, and the owners then expect to have all the offices filled with tenants.—*Daily Mail*.

NEW REREDOS, WOODFORD BRIDGE.—At St. Paul's Church, Woodford Bridge, on Saturday, November 30, the Bishop of St. Alban's dedicated the reredos which has been erected by public subscription as a memorial to the Rev. C. B. Waller, the late vicar. The reredos is of alabaster, and has six *opus sectile* panels, in which are figures of St. Matthew, St. Mark, St. Luke, St. John, St. Peter, and St. Paul. The reredos, and also a credence table which has been erected, were executed by Messrs. Butcher & Axtell. Messrs. J. Powell & Sons, of Whitefriars, were responsible for the *opus sectile* panels. The whole of the work was carried out under the supervision of the architects of the church, Messrs. William G. Bartlett & Son, of London.

CAPITAL AND LABOUR.

MASONS' STRIKE AT PAISLEY.—After extending over five months the strike of Paisley operative masons has come to an end. It was on July 1 that the strike commenced. The masters had proposed to fix the wages at 9d. per hour, being the same rate as Glasgow. This the Paisley men refused, insisting on a continuance of 9½d., and they then struck work. The men have now accepted the masters' terms.

LEGAL.

BUILDING BY-LAWS, BLACKPOOL.

AT Blackpool on the 1st inst. William Johnson was summoned for an offence against the building by-laws. The case had been adjourned for the Corporation to prove that the defendant was the owner of the premises, which, it was alleged, he had purchased from a builder named Hardman. The premises extended over the building line.

Mr. Callis, who represented the defendant, admitted he was the owner of the property, but as the offence was committed before he purchased, he could not be held liable. If it were so, nobody would dare buy property in Blackpool for fear of the Corporation coming down upon them for an offence committed by the previous owner. The man who had committed the offence was Hardman, who was now in South Africa, and had the Corporation been able to get at him they would have done so.

Mr. Stevens, the deputy Town Clerk, replied that if what Mr. Callis said was right the whole thing would be a farce, and it would be possible for two men to act in collusion and defeat the aims of the Corporation.

After a lengthy retirement the Bench decided that the offence was committed by Hardman, and the defendant not being liable, the case would be dismissed. Upon the application of Mr. Stevens, the Bench agreed to state a case.—*Lancashire Daily Post*.

ACTION BY AN ARCHITECT.

THE case of Thompson *v.* Tolhurst came before Mr. Justice Laurance and a special jury in the King's Bench Division on the 5th inst. It was an action by the plaintiff, an architect, to recover commission alleged to be due to him by the defendant, a solicitor.

It appeared that the plaintiff carried on business as an architect, surveyor, and land agent at Southend, and the defendant was the proprietor of the Warrior-square estate at that place. The son of the defendant, Mr. Bernard Tolhurst, asked the plaintiff to introduce lessees or purchasers, intimating that the usual rate of remuneration would be paid. The plaintiff's case was that it was agreed that he should have a fixed remuneration of 2½ per cent. for introducing a purchaser, and as to leases, it was left to the usual terms, which were one year's rent. The plaintiff disposed of a plot to a Mr. Burdett, and the Hotel Victoria, of which the plaintiff was architect, was built on it, and he was paid commission at 2½ per cent. in January, 1899. The plaintiff then prepared plans for an hotel for another plot and endeavoured to find a purchaser, and ultimately, through a Mr. Greenhalgh, introduced a Mr. Hayward, who agreed to take a lease for 99 years at 2,000*l.* a year ground rent on the terms of erecting an hotel according to plans which the plaintiff had prepared. Mr. Hayward appointed the plaintiff his architect and the Hotel Metropole was built on the site. The plaintiff received something under 3,000*l.* as architect's fees for his five years' work. When the plaintiff asked for his commission, as he had to pay a share to Mr. Greenhalgh, the defendant's son said that the appointment as architect was the only remuneration to which he was entitled. A sum of 300,000*l.* had been spent on the building, and the bank which had financed Mr. Hayward had gone into possession. Mr. Hayward had become bankrupt and cannot now be found.

The defence was that the arrangement come to was that the plaintiff was only to be paid for being architect of the building and was not to have any commission, and that, in accordance with this arrangement, the defendant and his son stipulated with Mr. Hayward that the plaintiff was to be appointed architect. As to the commission on the plot sold to Mr. Burdett, the defendant's case was that he was not liable for it, but paid it in case people should say he had behaved shabbily.

Evidence on behalf of the plaintiff was called to prove the custom that on the taking of land on a building lease at a ground rent, the estate agent introducing the person who took the lease was entitled to a commission equal to one year's ground rent, but that where the ground rent was a large sum, as in the present case, there was generally a special arrangement.

The jury awarded the plaintiff 1,300*l.*, and judgment was entered accordingly.

Mr. Duke, K.C., and Mr. Arthur Powell appeared for the plaintiff; and Mr. Bray, K.C., and Mr. George Wallace for the defendant.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

14,420.—METERS (ELECTRICITY): *A. Wright.*—A non-return pointer held so as to be movable against a spring by means of fluid frictional connection with the rotating spindle of a supply meter (see No. 17,764, of 1898) constitutes a maximum demand indicator. An axle, regulated with a spiral spring, carries a pointer over a graduated scale, and has a ratchet wheel that engages with a fixed spring-pressed pawl. Unless the pawl is drawn out by the hand it can turn only forwards. To the meter-spindle is affixed a cup that holds glycerine or other liquid in which vanes upon the axle turn, and the spindle is geared to a registering-train. For liquid friction air can be substituted by making the vanes of the cup and axle so large that they will pass near to one another.

14,437.—AN ATTACHMENT FOR T-SQUARES: *H. W. Roberts.*—A handle is fitted on to the blade of the T-square, and may also be joined with a cord to a block that is secured to the drawing-board, and has a recess that will fit across the blade; the block, when detached from the T-square, can be used with the cord for setting out ellipses.

14,446.—VALVES FOR FLUSHING AND OTHER PURPOSES: *R. C. Grundy, T. R. Grundy, and D. Grundy.*—The supply pipe is joined to a two-way valve, and has a conical check-valve—the former being formed of an inlet valve which a spring retains upon its seat and has on its spindle a piston that works in an air chamber. The spindle of the outflow valve is joined loosely to the spindle of the inlet valve, which will be drawn on to its seat when the other valve has been opened; the spindle of the outflow valve reaches downwards to the tilting seat of the closet. As the seat is depressed the outlet valve will become shut and the inlet valve will open so as to allow water to flow into the container, which will be discharged through the outlet valve as the seat rises.

14,476.—A WINDOW-FASTENER: *H. C. Crouch.*—A spring presses a bolt into engagement with the groove of the sash-frame; the bolt is enclosed in a casing upon the lower sash, and can be withdrawn with a lever, the key of which is controlled with a spring, and, being passed through the casing, will fit any one of a set of holes in the upper sash; a projection from the adjustable head of the key will engage with holes in a plate fastened to the sash; in the one position the key can freely engage with the sash, and in the others it is retained out of engagement.

14,483.—AN APPLIANCE FOR USE IN DRAWING, SKETCHING, &C.: *H. Sheaf.*—Two graduated scales are pivoted on to another graduated scale at a centre which is the origin of a series of radiating lines marked, as on a protractor, upon the base-scale. The extensions of the two other scales beyond that centre of the pivot are marked with central lines, by which one may read the angles between the scales.

14,486.—HOT-WATER APPARATUS: *T. Müller and R. Thomas.*—The radiator, devised for purposes of a steam-heating system, has a sheet-metal casing fitted with a perforated false bottom, a water-outlet, a steam-inlet, a safety-valve, and a steam whistle. The heat derived from the steam is stored up in fragments of burned clay, kaolin, &c., in the upper portion of the cage which when the steam has been periodically admitted and cut off will radiate the heat.

14,496.—A GUARD FOR CIRCULAR SAWS AND OTHER WOOD-WORKING MACHINES: *A. Cook.*—A roller that will bear against the surface of the wood is carried by a pair of spring arms upon an adjustable frame that can be lifted and lowered, a channel-shaped hood is arranged above the arms and is pierced, in its part above the roller, to allow one to see the cutters—all being placed upon a hinged bracket. For circular saws a spring lever is raised, when required, from the saw-table with a handle so that a roller upon the lever will rest upon the wood as it is being sawn.

14,503.—FIRE-BRICKS AND BLOCKS: *B. Talbot.*—The inventor seeks to obviate the cracking or breaking of acid or basic blocks and bricks in furnaces, gas-retorts, and so on. He soaks them in hydro-carbons, coal-tar, heavy oils, resin, for instance, heated to 100 deg. F. The resin or a hydro-carbon that is solid at ordinary temperatures is melted and used separately, or is added to the tar.

14,520.—FLUSHING APPARATUS: *H. L. Doulton.*—The long leg of a bell-siphon is trapped, and from the air-space in the crown of the siphon an air-pipe extends to a vessel wherein, under normal conditions, it is trapped; a lower vessel is connected with a pipe to the latrine outlet siphon, and contains a float which regulates a valve that communicates from one vessel to the other. As the latrine is filled the overflow passes to the lower vessel, whereupon the float rises to open the valve, to empty the upper vessel, and to unseal the end of the air-pipe. The consequent flush draws air away from the crown of the siphon outlet of the latrine, and so starts the discharge. In one of other modifications the starting of the siphon is effected by the lifting up of a bell which covers the end of the air-pipe.

14,526.—AN APPLIANCE FOR SLIDING-DOORS SASHES, &C.: *A. E. Alden.*—The doors and sashes are hung from ball-bearings. In the case, for instance, of sliding-doors, each of them is fitted with a casting grooved for the balls, and with a screw, a portion of which closes the end of the groove, the balls working upon a ledge; thus the door, which is free at the base, is held up.

14,542.—CONTRIVANCE FOR USE IN JOINERY WORK, &C.: *H. O. Howorth and J. V. Robinson.*—The apparatus is devised for marking out the places for tenons, mortices, and so on, in the making of window sashes, doors, door frames, and similar joiner's work. A cross-head is reciprocated vertically above a bed which is affixed to the table, being worked with a treadle framing that is joined by rods to the sleeves that slide upon fixed uprights and support the cross-head; the bed and cross-head carry the adjustable marking cutters, whilst an adjustable gauge-plate and stopping-piece control the position of the woodwork; in a modified form the cross-head and bed can be caused to approach one another horizontally, the gauge-plate being set in a horizontal plane.

14,550.—INSULATION OF ELECTRICAL CONDUCTORS: *N. Tesla.*—The conductors are surrounded with water or some aqueous solution, which is frozen with currents of cold gas, such as carbonic acid, hydrogen, or ammonia. In the case of solid conductors laid in a trough a tube for the cooling gas is also laid down, though it needs not to be used as a conductor. For transformers the coils may be mounted in absorbent media, the cooling gas being taken by the primary in tube shape.

14,620.—MEANS OF DISINFECTING CLOSET AND SIMILAR BASINS: *F. Lettice.*—A receptacle consists of three compartments into one of which the flush is, in part, diverted, and out of which it flows into another compartment that contains liquid disinfectant, some of which is thus forced through a tube into the third compartment, and so to the basin; an overflow pipe of adjustable height, and made of a tube that slides within another, serves as a regulator fitted between two of the divisions of the container.

14,621.—A LIFT VALVE: *W. Woodland.*—A cone-shaped body is screwed into the enlarged lower end of the hollow spindle, and fits on to a conical seating. The spindle is suitably packed within, and a screwed rod is provided for pressing the packing.

14,628.—A STAGE FOR USE IN HOUSE-PAINTING, WINDOW-CLEANING, &C.: *T. H. Streater and T. Allder.*—Brackets that carry a seat, or stand, are fixed upon the window-sill with clamps, studs, and screws, and hooked pivoted tie-bars carry uprights, which are pivoted to the brackets. The back of the frame, which can be folded up, is hinged at the middle, and also to the seat, and can be extended with hooked bars. The accidental disengagement of the hooks from the studs is prevented with pivoted tumblers. There are slotted guide-bars for the clamps, which are worked with screws mounted

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on sliding blocks clamped on to arms of the brackets.

14,633.—ELECTRICAL LIGHTING: *P. Lapertot, G. Villard, and L. Pignaud.*—The inventors seek to afford an intermittent supply, and to include in the circuit coils that will effect a sudden rise of potential at the moment of making circuit. In one form a conducting segment in engagement with six contact-brushes, of which the opposite ones are connected together, is mounted upon a drum. The common return and one pole, the drum and the other pole, and the brushes and lamp circuits are, respectively, connected. For continuous currents the use of a rotatory transformer is recommended, and the brushes should be arranged so that the circuit will be opened at the moment when there is no current, and shut again as soon as the voltage has increased.

14,646.—MEANS OF HEATING WATER: *M. I. Cohen.*—A gas-geyser, adapted for easy transport, has a casing consisting of two semi-cylindrical sections of sheet metal secured with hoops. The spraying-ring, which is supplied through a vertical pipe, is perforated within, and upon its under side. Over the burner are disposed a pile of pans which are flared upwards and downwards in turn, a trough, and a discharge-spout. The water is sprayed both within and without the pans, between which water-spreading rings are set.

14,672.—A HOLDER OR STAY FOR CASEMENT-WINDOWS: *G. F. Dean*—The stay is devised for holding the window at an angle, and will not project or hang down when the window is closed or opened. It is double-jointed on to a plate affixed to the sill, at its free end is a double-headed stud which is to be slipped through a notch into a guiding-piece on the bar that is secured to the bottom of the casement, and the end of the stay is retained in various positions by means of holes and notches in the bar, its movement being facilitated by ratchet tooth-shaped ridges between the notches.

14,687.—BLOCKS, TILES, SLABS, &C., FOR PAVEMENTS AND FLOORS: *G. F. Thomson.*—These are keyed with a backing of artificial stone by means of their recesses, projections, or ribs, they are laid with their faces downwards upon a flat table and clamped in a mould-frame consisting of four bars pierced near their ends and screwed together, the artificial stone is then run into the frame to fill the spaces. A mould for making three compound blocks at one time consists of two pieces secured to partition-plates made of slate, the spaces between the plates, pieces, and sides of the mould are filled with the artificial stone in a liquid state. For mosaic slabs pieces of stones, &c., are attached to a mould-plate, or to the partition-plates, before the stone is poured in. In one form the blocks are recessed so as to take the stone backing, and are to be fastened to one another with dove-tailed battens which are nailed or screwed on to them. A cement or concrete foundation is dispensed with, and worn slabs can be renewed.

14,728. — A PERCUSSIVE ROCK-DRILL: *S. Mesropian.*—The revolving hammer-heads are pivoted between two plates and held with their cam-shaped ends in such a manner that they will pass the drill after they have struck it. A shaft driven from a crank-handle or pulley with spur gearing carries the plates; a spring holds the drill down, and a worm-wheel driven from a shaft (on which fly-wheels or balls are mounted) with a worm and chain turn the drill. A frame that slides in a standard frame carries the drilling mechanism, and a screw worked with a hand-wheel and bevel gear supplies the feed.

14,743.—AN ELECTRICAL CUT-OUT: *H. F. Clayton.* — The contrivance, which is devised to obviate arcing and to afford means for the ready replacement of a fuse, consists of a cover, an inside piece joined to plug-contacts and holding the fuse, and a base to the sockets of which the main conductors are connected.

MEETINGS.

FRIDAY, DECEMBER 13.

Architectural Association. — "Travelling Students Notes," by Mr. J. E. Forbes. 7.30 p.m.

SATURDAY, DECEMBER 14.

Institution of Junior Engineers.—Visit to the Croydon Combined Electric Light and Traction Works. 3.15 p.m.

Dundee Institute of Architecture.—Visit to Arbroath and Hospitalfield.

MONDAY, DECEMBER 16.

Liverpool Architectural Society (Incorporated).—Mr. C. Brien on "Wood-staining and Veneering," illustrated with specimens of woods and stains. After the paper, Mr. James Cook will show with a lantern some slides of French Cathedrals. 6 p.m.

TUESDAY, DECEMBER 17.

Institution of Civil Engineers. — Discussion on Mr. Bryan Donkin's paper on "Motive-power from Blast-furnace Gases." 8 p.m.

WEDNESDAY, DECEMBER 18.

Society of Arts.—Professor George Forbes, F.R.S., on "Range Finders." 8 p.m.

Institute of Sanitary Engineers. — General Purposes and Finance Committee Meeting. 4 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Edinburgh Architectural Association.—Baillie Mackenzie on "Ventilating and Heating." 8 p.m.

THURSDAY, DECEMBER 19.

London Institution.—Mr. W. St. Chad Boscawen on "Recent Discoveries at Susa," illustrated. 6 p.m.

Institution of Electrical Engineers (Dublin Local Section).—An address will be given by the Chairman, Professor W. F. Barrett, F.R.S. 7.30 p.m.

Institution of Electrical Engineers.—Adjourned discussion on Mr. Arthur Wright's paper, entitled "Some Principles Underlying the Profitable Sale of Electricity." 8 p.m.

FRIDAY, DECEMBER 20

Architectural Association Discussion Section.—Mr. Howard Humphreys on "The Manufacture, Testing, and Uses of Portland Cement." 7.30 p.m.

Institution of Mechanical Engineers.—Mr. W. Campbell, B.Sc., on "The Microscopical Examination of the Alloys of Copper and Tin." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. A. M. Morgan on "Transmission Dynamometers." 8 p.m.

Glasgow Architectural Craftsmen's Society.—"Tiles": (*a*) Mr. W. G. Peddie on "Wall and Floor Tiles"; (*b*) Mr. J. M'Kim on "Substitutes for Tiles." 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

November 25.—By CHANCELLOR & SONS (at Richmond).

Richmond, Surrey.—1, George-st., c., r. 200*l.*	£4,650
46 and 47, George-st., c., r. 465*l.*	10,900
15, George-st., an improved rental of 20*l.* for 7 yrs.	300
34 and 36, The Vineyard, c., r. 45*l.*	510
38, The Vineyard, c., r. 120*l.*	2,200
Wandsworth.—51, High-st., f., r. 85*l.*	1,900
Mortlake.—44, High-st., f., r. 55*l.*	1,150
Putney.—32 to 38 (even), High-st., f., r. 410*l.*	9,350
1 and 3, Weimar-st., u.t. 67 yrs., g.r. 11*l.* 10s.	920

November 28.—By BAXTER, PAYNE, & LEPPER (at Bromley).

Bromley, Kent.—9, 11, 13, and 15, Havelock-rd., u.t. 78½ yrs., g.r. 18*l.*	450
Beckenham, Kent.—50 and 52, Rowden-rd., u.t. 89½ yrs., g.r. 7*l.*, r. 54*l.*	550

By DAVID J. CHATTELL (at Sidcup).

Foots Cray, Kent.—Cray-rd., seven plots of freehold building land	857

November 29.—By G. NICHOLS, HOWES, & CO. (at Newport).

Llantrissant, &c., Mon.—Penyrhewl Farm, 131 a. 0 r. 6 p., f.	1,750
Newchurch, Mon.—Buckhold Farm, 118 a. 0 r. 38 p., f.	1,225
Brooklands Farm, 8 a. 1 r. 21 p., f.	215

By GREEN & SON (Hammersmith).

Kensington.—Abingdon-rd., f.g.r. 21*l.*, reversion in 59 yrs.	570
67, Abingdon-rd., f., r. 72*l.*	1,660

By MARK LIELL & SON.

Bow.—130 and 132, St. Dunstan's-rd., with factory and foundry adjoining, f., r. 86*l.*	1,410
West Ham.—12 to 18 (even), Chaplin-rd., u.t. 80 yrs., g.r. 11*l.*	420

By MONTAGUE & ROBINSON.

Battersea.—21 and 23, Wye-st., u.t. 79 yrs., g.r. 9*l.* 10s.	440
61 and 63, Kambala-rd., u.t. 79 yrs., g.r. 11*l.*	545
Bermondsey.—9, Lynton-rd., u.t. 33 yrs., g.r. 5*l.*, r. 30*l.*	270
Poplar.—44, Northumberland-st., u.t. 51½ yrs., g.r. 2*l.* 10s.	190
Sutton, Surrey.—40 to 50 (even), George-st., u.t. 65½ yrs., g.r. 22*l.*	390

By PEACEY & FULLER.

Brentford, Middlesex.—St. Paul's-rd., a block of freehold building land, area 7,680 ft.	800

By WESTMORE & YOUNG.

Anerley.—24, Thicket-rd., u.t. 216 yrs., g.r. 13*l.*, r. 50*l.*	405

November 30.—By HAMPTON & SONS (at Wimbledon).

Wimbledon.—Durham-rd., eleven building sites, f.	1,164
Cambridge-rd., seven building sites, f.	467

December 2.—By ARDING & HOBBS.

Battersea.—31, Birley-st., u.t. 70 yrs., g.r. 3*l.* 10s.	270

By JOHN BOTT & SONS.

Brockley.—42, Whitbread-rd., u.t. 77½ yrs., g.r. 5*l.*, r. 32*l.*	375

By ELLIS & SON.

Notting Hill.—4, 6, 8, and 10, Elgin-cres., f., r. 223*l.*	4,440
12 and 14, Elgin-cres., u.t. 61 yrs., g.r. 20*l.*, r. 110*l.*	1,765
Chelsea.—430 and 432, King's-rd., u.t. 61 yrs., g.r. 4*l.*, r. 220*l.*	2,810
436, King's-rd., u.t. 61 yrs., g.r. 8*l.*, r. 70*l.*	1,000
Chelsea.—Church-st., a range of stabling, workshops, and yard, u.t. 12½ yrs., g.r. 21*l.*, r. 65*l.*	250
Bow.—52 to 58 (even), Campbell-rd., u.t. 61 yrs., g.r. 22*l.*, r. 130*l.*	1,330

By GRANT, WHIELDON, & CO.

Bayswater.—31, Pembridge-villas, u.t. 53 yrs., g.r. 20*l.*, r. 50*l.*	390

By F. MILLER & REID.

Finchley.—Holden-avenue, a freehold building site	430

By NORMAN & SON (at Stratford).

Forest Gate.—125, Hampton-rd., u.t. 80 yrs., g.r. 7*l.* 6s., e.r. 40*l.*	400
Walthamstow.—41, 43, and 45, Gladstone-rd., f.	650
Stratford.—30 and 32, Ashlin-rd., u.t. 45 yrs., g.r. 10*l.*	315

December 3.—By DEBENHAM, TEWSON, & CO.

Mayfair.—38, South Audley-st., beneficial leases for 10 yrs., r. 170*l.*	1,200

By FLEURET, SONS, & ADAMS.

Marylebone.—26 and 28, George-st. (Durrant's Hotel), u.t. 26½ yrs., g.r. 120*l.*, r. 420*l.*	3,260
Hampstead-rd.—Exmouth-st., &c., i.g.r. 94*l.* 11s., u.t. 9 yrs., g.r. 8*l.*	475
Exmouth-st., the Exmouth Arms p.-h., profit rental of 20*l.* for 9 years	100

By G. HEAD & CO.

Plaistow.—70 and 72, Chauntler-rd., f.	630

By MORLEY PHILLIPS, SONS, & MARTIN.

Copiapo, Chili.—The Copiapo Gasworks, area 1 a., f. (as a going concern)	5,400

By RUTLEY, SON, & VINE.

Holloway.—22 and 23, Hilldrop-cres., u.t. 47 yrs., g.r. 16*l.*	£1,110
Camden Town.—10 and 12, St. Paul's-cres., u.t. 59½ yrs., g.r. 14*l.*, r. 78*l.*	915
61, Torriano-av., u.t. 35 yrs., g.r. 1*l.*, e.r. 50*l.*	330
Kentish Town.—123, Weedington-rd., u.t. 61½ yrs., g.r. 6*l.* 6s., r. 32*l.*	345
32, Ashdown-st., u.t. 64½ yrs., g.r. 7*l.*, r. 34*l.*	415
108, Allcroft-rd., u.t. 64 yrs., g.r. 7*l.* 7s., r. 32*l.*	365

By H. W. SMITH.

Shepherd's Bush.—37, Oaklands-grove, u.t. 60 yrs., g.r. 10*l.*	270

By TOWERS, ELLIS, & CO.

New Bond-st.—No. 128, beneficial lease for 17½ yrs., r. 350*l.*	2,500

By FRED. WARMAN.

Edgware-rd.—No. 50, also 19, Hampden Gurney-st., u.t. 25½ yrs., g.r. 50*l.*, r. 250*l.*	2,430
Barnsbury.—36, 38, and 40, Warner-st., u.t. 58 yrs., g.r. 24*l.*	1,200
60, Roman-rd., u.t. 58 yrs., g.r. 8*l.*	350
Highbury.—24, Kelvin-rd., u.t. 67 yrs., g.r. 7*l.*, e.r. 48*l.*	460
Old Ford.—17, Auckland-rd., f., r. 33*l.*	480
Islington.—17 and 18, Astey's-row, u.t. 17 yrs., g.r. 12*l.*, r. 78*l.*	360

By TOMKINS & CAPPER (at Abergavenny).

Grosmont, Monmouth.—The Farm, 219 a. 3 r. 28 p., f.	2,500
Great Campston Farm, 472 a. 2 r. 11 p., f.	4,300
Little Campston Farm, 43 a. 0 r. 11 p. f.	500
Blantrothy Farm, 117 a. 3 r. 39 p., f.	1,010
Grosmont Wood Farm, 34 a. 0 r. 9 p., f.	620

By KNIGHT & BRANGWIN (at Masons' Hall Tavern).

City of London.—Fleet-st., Punch's Tavern, u.t. 68 yrs., r. 150*l.*, with goodwill; also 98 and 100, Fleet-st., and 25 and 26, Bride-lane, u.t. 74 and 70½ yrs., g.r. 675*l.*, r. 1,150*l.*	11,000

December 4.—By BAXTER, PAYNE, & LEPPER.

Sidcup, Kent.—4, The Crescent and 1 a. 3 r. 0 p., u.t. 67 yrs., g.r. 2*l.*, r. 120*l.*	1,320
Beckenham, Kent.—Barnmead-rd., Tarrawatta, u.t. 73½ yrs., g.r. 8*l.* 8s., r. 52*l.*	550

By FOSTER & CRANFIELD.

Hackney.—1, Lower Homerton-ter., f.	450
Homerton-ter., a plot of building land, f.	400
17 and 18, Hockley-st. and Western Cottage, u.t. 14½ yrs., g.r. 10*l.* 10s.	130

By REYNOLDS & EASON.

Stepney.—20 and 22, Elsa-st., f.	580
Poplar.—56, Cotton-st., f.	485

By CHAS. VARLEY.

Stamford Hill.—40, Castlewood-rd., u.t. 70 yrs., g.r. 6*l.* 10s., r. 34*l.*	300
Dalston.—46, 48, and 50, Mayfield-rd., u.t. 53 yrs., g.r. 24*l.* 10s., r. 114*l.*	1,135

By GEORGE RAMUZ.

Ropley, Hants.—Main road, two cottages and enclosure, 11 a. 2 r. 0 p., f.	130
Barnetts Wood-lane, five blocks of land, with a set of farm buildings, 49 a. 0 r. 12 p., f.	525

By WOOTTON & GREEN.

Dulwich.—521, Lordship-lane, f., r. 40*l.*	720

By DOUGLAS YOUNG & CO.

Hornsey.—Hillfield-avenue, Llyshendy, u.t. 90 yrs., g.r. 9*l.*, e.r. 65*l.*	620
Wimbledon.—88, Kingston-rd., u.t. 77 yrs., g.r. 7*l.*, r. 55*l.*	670
Lambton-rd., Haslemere, f., e.r. 55*l.*	550
Westgate-on-Sea, Kent.—2, The Grove, f., e.r. 45*l.*	550

December 5.—By CHESTERTON & SONS.

Kensington.—57, Bedford-gardens, u.t. 60 yrs., g.r. 120*l.*, e.r. 618*l.*	3,000
Soho.—33a, Dean-st., f., r. 80*l.*	1,860
Bermondsey.—Grange Walk, the Duke of Sussex b.-h., f.g.r. 34*l.* 13s., reversion in 24 yrs.	910

By FAREBROTHER, ELLIS, & CO.

Soho.—26 and 29, Dean-st., f., r. 130*l.*	3,550
13, Church st., f., r. 82*l.*	2,550
1 and 3, St. Ann's-court., f., r. 77*l.*	1,560
Bloomsbury.—33, Tavistock-sq., u.t. 21½ yrs. g.r. 30*l.*, e.r. 130*l.*	680

By HORNE & CO.

Shadwell.—37, 38, and 39, Wapping-wall, f., r. 30*l.*	695

By NEWBON, EDWARDS, & SHEPHARD.

Caledonian-road.—69, 71, and 73, Pembroke-st., u.t. 48 yrs., g.r. 3*l.*	1,065
98, 113, 119, and 121, Pembroke-st., u.t. 48 yrs., g.r. 24*l.* 10s.	1,225
54, 56, and 65, Outram-st., u.t. 56½ yrs., g.r. 18*l.*	1,090
Forest Hill.—36, 38, and 40, Siddons-rd., u.t. 94 yrs., g.r. 18*l.*, r. 84*l.*	610
Hampstead.—11, Lyncroft-gardens, u.t. 94 yrs., g.r. 11*l.*, e.r. 70*l.*	850
Stoke Newington.—Arcola-st., i.g.r. 40*l.*, u.t. 12 yrs., g.r. 14*l.*	200
Somers Town.—102 to 108 (even), Aldenham-st., u.t. 59½ yrs., g.r. 40*l.*	365

By ALFRED SQUIRE.

Chelsea.—20, Halsey-st., u.t. 41 yrs., g.r. 6*l.*, r. 60*l.*	675
Highgate.—95, North-hill, c., r. 30*l.*	530

By STIMSON & SONS.

Shepherd's Bush.—112, Devonport-rd., f., e.r. 40*l.*	550
Camberwell.—11, 13, and 15, Havil-st., f., r. 94*l.*	1,155
Kennington.—4, 5 and 6, Lucas-rd., u.t. 22½ yrs., g.r. 15*l.*	480
Anerley.—21, Derwent-rd., u.t. 63 yrs. g.r. 10*l.*, e.r. 40*l.*	235
Forest Hill.—35, Fermor-rd., u.t. 89¾ yrs., g.r. 6*l.*, r. 30*l.*	275
1, Boveney-rd., f., r. 42*l.*	570
Peckham.—96 and 102, Copeland-rd., u.t. 73½ yrs., g.r. 10*l.* 10s.	660
94, East Surrey-grove, u.t. 60½ yrs., g.r. 3*l.*	275
Walworth.—50, Olney-st., u.t. 13¾ yrs., g.r. 4*l.* 10s., r. 34*l.*	120
Stockwell.—17 and 19, Stockwell-grove, u.t. 35½ yrs., g.r. 6*l.*	300
Haggerston. — 11, Cester-st., u.t. 40 yrs., g.r. 4*l.* 10s.	135
Hornsey.—17, Harringay-rd., u.t. 68 yrs., g.r. 5*l.*	165
Wimbledon.—2, Latimer-rd., f., r. 45*l.*	700
Mitcham, Surrey. — Love-lane, two freehold houses, area 1 a., r. 36*l.*	600

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By WORSFOLD & HAYWARD (at Dover).

Dover, Kent.—10, Marine-parade, u.t. 21½ yrs., g.r. 1*l.* 16s. 3d.	£645
288 and 293, London-rd., f.	875
74, Maison Dieu-rd., u.t. 59 yrs., g.r. 5*l.* 8s., r. 40*l.*	450
61, Clarendon-pl., u.t. 67 yrs., g.r. 2*l.* 10s.	165
3 and 5, Chapel-lane, f.	420

December 6.—By BARKER & SON.

Leytonstone.—96 to 102 (even), Crownfield-rd., u.t. 77 yrs., g.r. 4*l.* 10s.	740
66, Granleigh-rd., u.t. 93½ yrs., g.r. 3*l.* 16s.	270
Hackney.—7 and 9, Brett-rd., u.t. 74½ yrs., g.r. 13*l.*	565
Walthamstow.—67, Hoe-st., u.t. 75 yrs., g.r. 6*l.*	240

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 12 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 10 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts	1 12 0	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 6 6	,,	,, ,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 4 0	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	8 0 0	,,	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt	

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.	
Bath ,,	1 7	,,	,,
Farleigh Down Bath	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,,	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt	
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt	
,, ,, ,, 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
,, ,, ,, 3-in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor	11 5 0	per 1000 of 1200	at ry. dep
,, best seconds ,,	10 15 0	,,	,,
16× 8 best ,,	6 2 6	,,	,,
20×10 best blue Portmadoc	10 18 0	,,	,,
16× 8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green	11 2 6	,,	,,
16× 8 ,, ,,	6 15 0	,,	,,
20×10 Permanent green	10 0 0	,,	,,
16× 8 ,, ,,	5 12 6	,,	,,

PRICES CURRENT (*Continued*).

TILES.

	s. d.		
Best plain red roofing tiles	42 6	per 1,000	at rly. depôt
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	£ s. d.	£ s. d.	
	At per standard.		
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0	
Deals: best 3 by 9	13 0 0	14 10 0	
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0	
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0	
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.	
½ in.	1 0 0	,,	
Fir timber: Best middling Dantzig or Memel (average specification)	At per load of 50 ft.		
	4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks	2 15 0	3 0 0	
Pitch pine timber (32 ft.)	3 0 0	3 10 0	

JOINERS' WOOD.

	£ s. d.	£ s. d.	
	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0	
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0	
,, ,, 3 in. by 9 in.	15 12 0	16 10 0	
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0	
Battens, 2½ in. and 3 in. by 7 in.	10 12 0	11 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0	
Do. 3 in. by 9 in.	16 0 0	17 0 0	
Battens	12 10 0	13 0 0	
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0	
Do. 3 in. by 9 in.	13 0 0	14 0 0	
Battens	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0	
Do. 3 in. by 9 in.	11 0 0	12 0 0	
Battens	10 0 0	11 0 0	
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	13 10 0	14 10 0	
,, ,, ,, 3 in. by 9 in.	12 10 0	13 0 0	
Battens	10 10 0	11 10 0	
Second white deals 3 in. by 11 in.	12 10 0	13 10 0	
,, ,, ,, 3 in. by 9 in.	12 0 0	12 10 0	
,, ,, battens	9 10 0	10 10 0	
Pitch pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes	32 0 0	33 10 0	
Broads (12-in. and up)	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6	
Dantzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,,	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7	
½ in. do. do.	0 0 7	- - -	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6	

Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton.	
	£ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Flitch Plates	8 10 0	9 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

PRICES CURRENT (*Continued*)

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	13 5 0	- - -
Pipe in coils	13 15 0	- - -
Soil Pipe	16 5 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
,, ,, fourths	2¾d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, ,, fourths	3¾d. ,, ,,
26 oz. thirds	4¾d. ,, ,,
,, ,, fourths	4¾d. ,, ,,
32 oz. thirds	5¾d. ,, ,,
,, ,, fourths	5¾d. ,, ,,
Fluted sheet, 15 oz.	3¾d. ,, ,,
,, ,, 21 ,,	4¾d. ,, ,,
½ Hartley's Rolled Plate	2¾d. ,, ,,
⅝ ,, ,, ,,	3¾d. ,, ,,
¾ ,, ,, ,,	3¾d. ,, ,,

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes	0 2 10	per gallon
,, ,, ,, in barrels	0 2 11	,,
,, ,, ,, in drums	0 3 1	,,
Boiled ,, ,, in pipes	0 3 0	,,
,, ,, ,, in barrels	0 3 1	,,
,, ,, ,, in drums	0 3 3	,,
Turpentine, in barrels	0 2 3	,,
,, in drums	0 2 6	,,
Genuine Ground English White Lead	21 10 0	per ton
Red Lead, Dry	21 10 0	,,
Best Linseed Oil Putty	0 8 6	per cwt.
Stockholm Tar	1 12 0	per barrel

VARNISHES, &c.

	per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. S. M.—S. S. (Amounts should have been stated).

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

AYLSHAM (Norfolk).—For alterations at workhouse, for the Guardians. Mr. J. B. Pearce, architect, 15, Upper King-street, Norwich. Quantities by architect:—

Hawes & Son	£940 0	F. Culley	£789 0
W. Wilkin	833 0	Boddy & Son	744 10
R. Chapman	820 0	C. S. Bligh	720 0
G. Took	796 0	W. & H. Wade, Aylsham*	695 1
W. Wilson	792 10		

BRISTOL.—For the construction of sewers, Sneyd Park and Shirehampton, for the Barton Regis Rural District Council. Mr. A. P. T. Cotterell, C.E., 28, Baldwin-street, Bristol:—

	Sneyd Park Sewer.	Bradley Crescent Sewer, Shirehampton.
W. & J. Bennett	£1,000 0	£320
S. Wood	827 0	280
J. Flower	825 0	335
J. Hatherley	724 0	237
M. Lovell	717 0	281
J. & T. Binns	700 0	240
A. Heard, Shirehampton	674 0*	225
Lowe, Ltd.	673 0	265
Dare & Sons	669 10	—
Mereweather & Son, Bedminster, Bristol	629 0*	239

CANTERBURY.—For the erection of three cottages in the Martyrs' Fields-road, for Mr. Edward Layton. Mr, A. H. Steele, architect, 1, Effingham-lawn, Folkestone-road, Dover. Quantities by the architect:—

Mount	£1,200	Elvey	£956
Brewster	1,140	Lewis & Sons	874
Smellie	1,010	Goldsmith & Tapley, Dover*	774
Turner & Co.	978		

CASTLEISLAND (Ireland).—For the erection of a tower and spire at church, for Ven. Archdeacon O'Leary. Mr. D. J. Coakley, C.E., 1, Charlotte Quay, Cork:—

J. A. O'Connell	£4,929 18	J. J. Coffey	£3,297 0

CROOKSTON (N.B.).—For works at schools for the Inveresk School Board. Mr. Constable, architect, 3, Hill-street, Edinburgh:—

Masonry.—Banks & Son, Musselburgh*	£1,181 0 0
Joinery.—Adam Currie, Edinburgh*	912 0 0
Plumbing.—David Templeton, Tranent*	170 0 0
Plastering.—Alfred Bolster, Edinburgh*	209 15 0
Slating.—James Strachan, Musselburgh*	286 2 0
Ironwork.—Bell & Son, Edinburgh*	99 18 0
Painting.—T. S. Chalmers, Dalkeith*	80 4 11
Glazing.—Coutts & Cameron, Edinburgh*	40 8 6
Heating.—Mackenzie & Moncar, Edinburgh*	127 0 0

DURHAM.—For the erection of printing works, Saddler-street, for Mr. T. Caldelough. Mr. H. T. Gradon, architect, Market-place, Durham:—

J. G. Bradley	£2,080 0	Thos. Coates	£1,863 0
Draper & Sons	2,000 9	Gradon & Son, Durham†	1,814 0
G. T. Manners	1,995 0		
Ayton & Caldcleugh	1,912 0		

EALING.—For building eight houses and shop on the Ealing Park Estate, for Mr. John Angles. Mr. J. Hume, architect and surveyor, High-road, Chiswick:—

J. H. Johnson, Ealing Park‡ £2,890

‡ Amended tender.

FENTON (Staffs.).—For the erection of a steam bakery. Mr. Elijah Jones, architect, 10, Albion-street, Hanley:—

L. Price	£1,142 0 0	Brain & Smith	£995 0 0
C. Dunn	1,138 15 0	T. Godwin	940 0 0
P. Bennion	1,093 0 0	Cornes	930 0 0
R. James	1,091 15 8	J. Bagnall, Fenton*	925 0 0
Embrey & Co.	1,077 7 6		
Moore & Co.	1,024 0 0		

FLEETWOOD (Lancs).—For the erection of a pavilion, &c., for the Urban District Council. Mr. E. Frobisher, C.E., Town Hall, Fleetwood. Quantities by Mr. H. A. Luke, 22, Great Chapel-street, Westminster:—

J. C. Barnes	£1,316 17 9	Parkinson & Sons	£1,214 7 10
Lancaster & Atkinson	1,308 3 7	T. Riley	1,212 11 1
Blackburn & Hastings	1,289 0 0	The Portable Building Co., Ld., Fleetwood*	1,149 1 2

GREAT BENTLEY (Essex).—For alterations to the Wesleyan Chapel, for the Trustees. Mr. C. E. Butcher, architect, 3, Queen-street, Colchester. Specification only by the architect:—

Dumerton	£207 10	H. Smith	£156 0
J. Canham	185 0	J. McKay	149 0
Pennick & Taylor	165 0	E. Capon, Manningtree*	120 14
G. & J. Ambrose	165 0		

HALIFAX.—For the erection of the Golden Lion Hotel, Highroad Well, for Messrs. Bear & Brown, Ltd. Mr. Lister Coates, architect, Waterhouse-street, Halifax:—

Masonry, Bricklaying, and Excavating.

Thomas Pickles, Luddenden Foot, near Halifax* £2,096 13

Carpentry and Joinery.

Fielding & Bottomley, South Parade, Halifax* £777 17

Plumbing and Glazing.

Naylor & Son, Cheapside, Halifax* .. £330 0

Slating and Plastering, and Concrete.

Rushworth & Firth, New Bank, Halifax* £455 10

Painting and Paperhanging.

Milligan & Son, Hanson-lane, Halifax* £50 0

Total.... £3,710 0

HARROW-ON-THE-HILL.—For the execution of sewerage works, for the Urban District Council. Mr. J. P. Bennetts, Surveyor, Council Offices, Harrow-on-the-Hill:—

T. W. Pedrette	£9,433	J. Jackson	£8,230
E. W. Hollingsworth	8,923	Wilkinson Bros.	8,216
Meston & Hall	8,545	Clift Ford, Harlesden*	7,974
Cooke & Co.	8,483	Lowes Syndicate	7,425
J. & T. Binns	8,404		
Wimpey & Co.	8,254		

[Surveyor's estimate, £8,350.]

HAYLE (Cornwall).—For the erection of school buildings, and alterations to chapel. Mr. Sampson Hill, architect, Green-lane, Redruth:—

	For School.	For Chapel.	Total.
Walters	£2,181 16 6	£978 5 6	£3,159 7
Winn	1,889 10 0	934 0 0	2,823 10
W. C. Hodge	1,750 0 0	853 0 0	2,603 0
Miners	1,760 0 0	837 0 0	2,597 0
Hosking	1,755 8 0	796 2 0	2,551 10
White & Thomas, Crowan, Camborne*	1,816 0 0	673 0 0	2,489 0

HESWALL (Cheshire).—For the construction of Lydiate-road, for the Wirral Rural District Council. Mr. Thomas Davies, surveyor, Eastham:—

Lee & Sons	£217 19 11½	R. Hughes, Brinstage*	£200 0 0

HORLEY (Surrey).—For the erection of a fire-engine station and fireman's residence in the Albert-road, Horley, for the Horley Parish Council. Mr. C. H. Burstow, architect, 6, West-street, Horsham, Sussex:—

Thomas Wickens, Chapel-road, Charlwood* £848

HORSHAM (Sussex).—For pulling down business premises, No. 57, East-street, Horsham, and erection of new house and shop thereon, for Mr. Thomas Richardson. Mr. C. H. Burstow, architect, 6, West-street, Horsham:—

G. Potter	£1,080 0	Potter Bros.	£898 0
Lindfield & Son	960 0	Hillman & Murrell*	807 10
Rowland Bros.	938 0	[All of Horsham.]	

ILLOGAN.—For girls' school at Illogan, for the Illogan School Board. Mr. Sampson Hill, architect and surveyor, Green-lane, Redruth:—

Hosking	£1,415 12	J. Roberts, Carn Brea, R.S.O.*	£1,058 10
J. Odgers	1,320 0	W. H. Moyle	1,050 0
Opie & Hodge	1,310 0		
Mitchell & Hodge	1,135 0		

ILSINGTON.—For the erection of stables, &c., Moorland Hotel, Hayter Rock, for Messrs. Hellier. Mr. S. Segar, architect, Newton Abbon, Devon:—

Bovey & Son, Torquay £800

KETTERING.—For Outfall Sewers and Flushing Chambers, for the Urban District Council. Mr. T. R. Smith, Surveyor, Market-place, Kettering:—

—	East Outfall.	West Outfall.	Flushing Chamber.
	£ s. d.	£ s. d.	£ s. d.
Tate & Eastwood	2,933 16 0	2,404 12 0	1,407 0 0
C. Chamberlain	2,699 10 6	2,384 6 0	1,134 8 6
Johnson & Langley	2,681 17 1	2,058 17 7½	1,045 5 0
S. Lucas	2,678 4 5	2,174 18 2	—
Brown & Sons	2,653 16 7	2,137 4 5	1,129 16 0
Moss & Sons	2,643 7 10	2,115 2 6	1,099 13 0
Lock & Andrews	2,637 6 3	2,082 5 10	998 15 0
H. Weldon	2,626 18 6	2,112 7 1	1,148 0 0
J. Jackson	2,605 3 6	2,238 13 10	1,232 8 0
I. Philbrick	2,597 5 0	2,048 15 0	1,163 11 0
H. H. Barry	2,575 0 0	1,983 0 0	1,175 0 0
Holmes'	2,559 9 4	1,941 19 3	1,109 10 0
Kettering Co-operative Builders	2,538 0 0	2,102 0 0	1,060 0 0
Johnson & Son	2,520 0 0	2,078 0 0	1,005 0 0
W. Cunliffe	2,487 8 0	1,941 18 7	997 18 6
Lewin & Son	2,425 0 0	*1,885 0 0	*914 0 0
F. Barlow*	2,423 0 0	1,991 0 0	943 0 0

LLANDRINDOD WELLS.—For the erection of two houses for Mr. J. H. Dover, Knighton. Mr. Peter Morris, architect, Llandrindod Wells:—

H. Gough	£1,320	H. Millward, Llandrindod Wells*	£1,000
Weale & Lloyd	1,214		
R. E. Davies	1,078		

LONDON.—For the erection of intermediate school buildings, Swaffield-road, for the Wandsworth and Clapham Guardians. Messrs. Lansdell & Harrison, architects, 65, Basinghall-street, E.C. Quantities by Mr. Frederick Hingston, Portland House, Basinghall-street, E.C.:—

Walter Wallis, Balham, S.W.* £15,997

[Fourteen tenders submitted.]

LONDON.—For asphalting Paradise-place, and other works, Hammersmith. Mr. H. Mair, C.E., Town Hall, Hammersmith:—

	Per sup. yard. s. d.
Nowell & Co.	12 3
Val de Travers Asphalte Paving Co.	12 0
Wimpey & Co., The Grove, Hammersmith, W.*	12 0
Brunswick Rock Asphalting Paving Co.	6 0

[Price does not include excavation or concreting.]

LONDON.—For engineering works in connexion with the new infirmary, Acton-lane, Willesden, N.W., for the Guardians of the Poor of Willesden Parish. Mr. A. Saxon Snell, architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

Summerscales & Sons, Ltd.	£11,436 0	Berry & Sons	£9,515 0
Potter & Sons	10,093 15	Rosser & Russell, Ltd., Hammersmith*	8,923 0
J. & F. May	9,870 0		

LONDON.—For alterations and decorations to No. 98, Gloucester-place, Portman-square, W., for Mr. G. R. FitzRoy Cole. Mr. George F. Sharpe, architect and surveyor, 57 and 58, Chancery-lane, W.C., and Hampton Hill, Middlesex:—

John Barker & Co., Ltd., High-street, Kensington .. £248

For Sanitary Work and Fittings.

R. P. Beattie, Westminster £115

MALDON (Essex).—For the execution of sewerage works, &c., Tollesbury, for the Rural District Council Mr. H. G. Keywood, C.E., Public Hall Chambers, Maldon:—

C. T. Thorn	£1,608 7 9	Burgoyne & Sons, 9, Wolsey-street, Ipswich*	£807 11 4
T. W. Pedrette	1,187 9 4		
G. Hayward	1,012 6 6		

[Engineer's estimate, £786 6s. 8d.]

MERTON.—For additions to Merton School. Mr. H. G. Quartermain, architect, Kingston-road, Merton. Quantities supplied by Messrs. J. Leaning & Sons:—

Gough & Co.	£5,200	Lorden & Sons	£4,844
Wall & Co.	5,123	Garratt & Sons	4,800
Smith & Son	4,937	Parsons & Townsend	4,647
Holliday & Greenwood	4,884	Burges & Sons	4,495

NEW BARNET.—For making-up Cat Hill Bridge, for East Barnet Valley Urban District Council. Mr. Henry York, surveyor, Station-road, New Barnet:—

Clift Ford	£1,639 0 0	G. Bell	£1,278 0 0
W. Butcher	1,505 0 0	Kitteringham	1,275 0 0
J. Dickson	1,415 0 0	R. Jackson	1,193 0 0
Myers, Gilson, & Rose	1,409 10 5	Willmott & Sons, Hornsey*	1,047 0 0
T. Adams	1,392 0 0		
Dinnie	1,338 0 0		

PENTRE.—For the erection of Police-court at Pentre, Rhondda, Wales. Messrs. Griffiths & Jones, architects, Tonypandy and Cardiff. Quantities by Mr. D. Pugh-Jones, 12, Glynrhondda-street, Cardiff:—

Morgans Bros., Ton Pentre, Rhondda* £3,335 12 8

PORTREATH.—For reseating and renovation of Wesleyan Chapel at Portreath. Mr. Sampson Hill, architect and surveyor, Redruth:—

W. C. Hodge	£299 12	J. Roberts	£268 9
T. Willoughby	270 0	W. H. Moyle, Chacewater*	250 0

PRESTON (Lancs.).—For the execution of paving works, Fylde-road and Water-lane:—

Richard Lomax, Lostock Hall, near Preston (labour only) £855 6 9

RUDGWICK (Sussex).—For the erection of a new residence at Snell's Farm, Rudgwick, for Mr. Douglas Arden. Mr. C. H. Burstow, architect, 6, West-street, Horsham, Sussex:—

Hillman & Murrell	£975	Hull & Redford	£899
W. Street	970	Rowland Bros., Horsham‡	893
Lindfield & Son	940		

‡ Lowest tender accepted after making certain deductions.

SWANSEA.—For the erection of infirmary at workhouse, for the Guardians. Messrs. Wills & Williams, architects, Wind-street, Swansea. Quantities by Mr. Wm. David, 97, Gorse-lane, Swansea:—

Lloyd Bros., Argyle-yard, Argyle-street, Swansea £15,681 10 7

TADWORTH.—For the erection of a detached residence at Tadworth, Surrey, for Mr. Peter Chalwin. Mr. George T. Sharpe, architect and surveyor, 57 and 58, Chancery-lane, W.C., and Hampton Hill, Middlesex:—

J. T. Bassano, Bloomsbury, W.C. £1,050

See also page 545.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
Laying out Recreation Ground	Gillingham (Kent) U.D.C.	20*l.*, 10*l.* and 5*l.*	Jan. 1
Water Supply Works	North Dublin R.D.C.	50*l.*	Jan. 20
*House of Two Storys	Battersea Borough Council	50*l.*	Jan. 31
*House of Two Storys Self-contained Tenements	do.	25*l.*	do.
*House of Three Storys Self-contained Tenements	do.	10*l.*	do.
*Monument as Memorial to Her late Majesty	I. of W. Queen Vic. Mem. Comte.	25*l.*	do.
Dwellings, Alexandra Park	Glasgow Corporation	100*l.* 50*l.* and 25*l.*	Feb. 1
*New Buildings at Langho, near Blackburn	Chorlton, &c., Jt. Asylums Com.	200*l.*, 150*l.* and 100*l.*	April 4

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Erection of Show Yard, Leeds	Yorks Agricultural Society	Society's Office, Blake-street, York	Dec. 16
*Best Glazed Stoneware Pipes	The Building Supply	Secretary, The Building Supply, King's Cross, W.C.	do.
Schools, Chaucer-road	Fleetwood (Lancs) School Board	T. G. Lumb, Architect, 26, Birley-street, Blackpool	Dec. 17
Lift Station, East Hill	Hastings Corporation	P. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
Restaurant, Marine Parade, Great Yarmouth	Messrs. J. & W. F. Goode	C. G. Baker, Architect, Town Hall Chambers, Great Yarmouth	do.
Three Purifiers at Gasworks	Stourbridge Gas Committee	W. North, Engineer, Gasworks, Stourbridge	do.
Two Cottages, Hebden, near Grassington, Yorks		J. Hartley, Architect, Skipton	do.
Road Works, Glengormley	Belfast R.D.C.	Young & Mackenzie, Engineers, Belfast	do.
Widening Railway, Entwistle, near Bolton	L. & Y. Railway Company	Engineer, Hunt's Bank, Manchester	do.
Firebricks, &c.	Chorley Corporation	J. W. Allen, Gas Engineer, Town Hall, Chorley	do.
Alterations to Ashburton House, Beckenham-rd. Penge		The Secretary, 76, Beckenham-road, S.E.	do.
14 Shops, Kirkgate, Wakefield		G. Bolshaw, Architect, 189, Lord-street, Southport	do.
Hotel, Rose Hill, Rawmarsh		H. L. Tacon, Architect, 11, Westgate, Rotherham	do.
Eight Houses, Rawmarsh	Messrs. Whitworth, Son, & Nephew	do.	do.
Additions to Schools	Gosberton (Lincs.) School Board	R. H. H. Hand, 6, Double-street, Spalding	do.
School and Boundary Walls, Honicknowle	St. Budeaux (Cornwall) School Bd.	T. R. Kitsel, Architect, 1, George-street, Plymouth	do
*Wrought-iron and Wood Fencing	Ilkeston Town Council	Borough Surveyor, Town Hall, Ilkeston	Dec. 18
*River Wall and Elevated Track for Crane	Hammersmith Council	Borough Surveyor, Town Hall, Hammersmith	do.
Engine Shed, &c., Neville Hill, Leeds	North-Eastern Railway Company	W. Bell, Architect, York	do.
Police Station, Swinefleet, near Goole	West Riding County Council	J. V. Edwards, County Surveyor, Wakefield	do.
Sewers, &c., Longley Norland	Halifax R.D.C.	F. Gordon, Surveyor, Clifton, Brighouse	do.
Sewerage Works, Senny Bridge	Brecknock R.D.C.	B. L. Pritchard, Surveyor, 8, Castle-street, Brecon	do.
Drainage Works	Arbroath (N.B.) Council	W. Stewart, Burgh Surveyor, Arbroath	do.
Street Works, Market-place and Holly-walk	Enfield U.D.C.	R. Collins, Surveyor, Court House, Enfield	do.
Sewering, &c., Parkfield-place	Birkenhead Corporation	C. Brownridge, Civil Engineer, Town Hall, Birkenhead	do.
Six Houses, Moldgrew, Huddersfield		J. Berry, Architect, 4, Market-place, Huddersfield	do.
Alterations to Dispensary, Blackrock, Ireland	Rathdown Guardians	P. F. Comber, Civil Engineer, 19, Lower Leeson-street, Dublin	do.
Additions to Schools, Spon-street	Coventry School Board	G. & T. Steane, Architects, 22, Little Park-street, Coventry	do
Alterations at Workhouse	Southwell Guardians	Mr. Cottam, Surveyor, Church-street, Southwell	Dec. 19
Laying Water Pipes (9½ miles)	Axbridge (Somerset) U.R.D.C.	A. Powell, Civil Engineer, 3, Unity-street, Bristol	do.
Firebricks, &c.	Leeds Corporation	R. H. Townsley, Gas Offices, Leeds	do.
Additions to Sanatorium	Gravesend Town Council	Borough Surveyor, Town Hall, Gravesend	do.
Store Premises, Coundon	Bishop Auckland Co-op. Soc., Ltd.	F. H. Livesay, Architect, 107, Newgate-street, Bishop Auckland	do.
Electricity Works, Belfast		Engineer, Electricity Station, East Bridge-street, Belfast	do.
Paving Works, &c.	Walthamstow U.D.C.	G. W. Holmes, Civil Engineer, Town Hall, Walthamstow	Dec. 20
Additional Wing at the Ness, Shaldon		Ellis, Son, & Bowden, Surveyors, Bedford Chambers, Exeter	do.
Additions to Premises, Tame-street, Ancoats	Manchester Guardians	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	do
Sewers, &c., Mevagissey, Cornwall	St. Austell R.D.C.	T. H. Andrew, Engineer, 1, Trevarrick-villas, St. Austell	Dec. 21
Sewerage Works, Otley-road	Harrogate Corporation	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	do.
Hospital, New Tredegar, Mon.	Bedwellty U.D.C.	J. A. Shepard, Town Hall, Tredegar	do.
*Corrugated Iron Hospital	Bedwellty U.D.C.		do.
*Granite Kerb and Channel	Brighton Council	Borough Engineer, Town Hall, Brighton	Dec. 23
School	Chatteris (Cambs.) School Board	W. Wren, Surveyor, Mount Pleasant, Cambridge	do.
Street Works, Boston-avenue, and others	Southend Corporation	A. Fidler, Civil Engineer, Town Hall, Southend	do.
Wood Paving Blocks, and Stone Paving	do.	do.	do.
House, &c., Harrogate		Adkin & Hill, Architects, Bradford	do.
Bridge, Cole Park Estate, Twickenham	Manchester Corporation	G. F. Sharpe, Architect, 57, Chancery-lane, W.C.	do.
Mason's Shed, Little Newton-street, Ancoats	Lanchester Guardians	City Surveyor, Town Hall, Manchester	do.
Well Sinking at Workhouse	Commissioners of H.M. Works, &c.	W. H. Ritson, Lanchester	Dec. 24
*Postmen's Sorting Office, New Cross-road	Aston Guardians	J. Wager, H. M. Office of Works, Storey's Gate, S.W.	Dec. 30
Pavilions at Workhouse, Erdington	Blackpool Corporation	C. Whitwell & Son, Architects, 23, Temple-row, Birmingham	do.
Portland Cement (5,000 tons) Rigby-road	Kingston-on-Thames Corporation	J. S. Brodie, Civil Engineer, Town Hall, Blackpool	Dec. 31
*Two Filter Beds at Sewage Works	Bakewell R.D.C.	Borough Surveyor, Clattern House, Kingston-on-Thames	Jan. 1
Water Supply Works	Leeds Corporation	Sterling & Swann, Engineers, Town Hall, Chapel-en-le-Frith	Jan. 3
*Extension of Seacroft Hospital	Nantwich (Cheshire) U.D.C.	City Engineer, Municipal-buildings, Leeds	Jan. 4
Electricity Plant	Corporation of London	G. R. Peers, 39, Victoria-street, Westminster, S.W.	Jan. 6
*Widening London Bridge	The Committee	City Surveyor, Guildhall	Feb. 17
*Library Buildings, Southampton		Secretary, Public Library, Southampton	No date
*Cottage Hospital, Southwold		C. N. Cubitt, Architect, Brentwood, Essex	do.
*Erection of Bungalow, Bognor		Hall, Cooper & Davis, Architects, 10, Gray's Inn-square, W.C.	do.
Two Villas, Greenhill Park Estate, Evesham		F. Foster, Architect, Coventry	do.
Chimney, Widnes		S. P. Bidder & Co., 45, Blackfriars-street, Blackburn	do.
Factories, &c., Bridge Mills, Long Eaton		J. Sheldon, Architect, Darley House, Long Eaton	do.
Two Shops, Heygate-avenue, Southend		Greenhaigh & Brockbank, Architects, Bank-chambers, Southend	do.
Four Cottages, Shawford, near Winchester		Colson & Co., Architects, 45, Jewry-street, Winchester	do.
*Road, Appin House, Oban		Hosack & Sutherland, Royal Bank, Oban	do.
Street Works, Hill-street, Netherton		W. Onslow, 62, Church-road, Onslow	do.
Additions to Schools, Mill-hill, Blackburn		Stones & Stones, Architects, 10, Richmond-terrace, Blackburn	do.
Six Houses, Jubilee-street, Darwen		Woods & Thackeray, Architects, Darwen, Lancs	do.
Two Houses, Hesse-street, Darwen, Lancs		do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Building Inspector	Salford Corporation	120*l.*	Dec. 19
*Clerk of Works	Rochford Union	3*l.* 3*s.* per week	Dec. 23

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xix. Public Appointments, pp. xvii. & xix.*

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TWICKENHAM.—For the erection of three detached houses on the Cole Park Estate, Twickenham. Mr. George F. Sharpe, architect and surveyor, 57 and 58, Chancery-lane, W.C., and Hampton Hill, Middlesex :—

S. Wright, St. Margaret's..... £2 250

TWICKENHAM.—For the erection of three detached houses on the Cole Park Estate, Twickenham. Mr. George F. Sharpe, architect and surveyor, 57 and 58, Chancery-lane, W.C., and Hampton Hill, Middlesex :—

J. Kearley, Teddington..... £2,315

TWICKENHAM.—For the construction of new roads and sewers, with manholes and gullies, on the Cole Park Estate, Twickenham, for Mr. G. R. FitzRoy Cole :—

Brougham, Horstcroft, & Co.	£455 0 0	Lawrence & Thacker	£988 2 11
S. Wright	375 0 0	Filkin & Watson	287 0 0
Thos. Adams	357 18 6	R. & W. Swaker	285 12 0
Higby & Robson	330 6 4	J. W. Dean	268 14 3
J. Willis	310 0 0	Steven Kavanagh	263 0 0
Wimpey & Co.	307 0 0	Bentham & Co.	259 0 0
Atkins & Son	306 0 0	W. H. Wheeler, Blackfriars-road, S.E.*	235 0 0
J. Kearley	298 10 0		

* Accepted, with further extension, on schedule of prices.

UXBRIDGE.—For the execution of sewage works Cowley, for the Rural District Council. Mr. J. F. Stow, engineer, Corn Exchange, Uxbridge :—

A. Hewens, Hayes* ..... Schedule of price.

WAKEFIELD.—For the erection of store premises, Lofthouse, for the Leeds Industrial Co-operative Society, Limited :—

Building.—Binks Bros., Coach-road, Outwood, Wakefield £510 0

Joinery.—Blakeley & Thackeray, Upper Wortley, Leeds 321 0

Plastering.—John Platts, Saville-street, Wakefield 18 19

Slating.—Watson & Worsnop, Whitehall-road, Leeds 39 0

Steel Joists.

Per ton.

Walter Scott, Ltd., Leeds Steel Works, Leeds £6 15

Compound Steel Girders.

Walter Scott, Ltd., Leeds Steel Works, Leeds 9 5

WEST HAM.—For the erection of thirty-six double tenement houses, Invicta and Rendel-roads, Canning Town, for the West Ham Corporation. Mr. J. G. Morley, Borough Engineer, Town Hall, West Ham, E. :—

Spencer, Santo, & Co.	£21,000 0 0	Shelbourne & Co.	£16,542 0 0
Calnan & Son	20,063 0 0	Gregar & Son	15,930 0 0
W. Irwin	19,215 18 11	Barker & Co.	15,826 0 0
H. L. Holloway	18,370 0 0	Haines & Co.	14,656 0 0
Martin Wells & Co.	17,999 0 0	Herbert Bros.	14,247 0 0
W. E. Davey	17,275 0 0	G. Wise, Works Manager*	13,955 0 0
Hardy Bros.	16,565 0 0		

WILLITON (Somerset).—For the execution of drainage works at workhouse, for the Guardians. Mr. T. H. Andrew, surveyor, Williton :—

H. W. Pollard	£1,199 0	Chibbett & Sons, Williton, Somerset*	£994 9
Morse Bros.	1,062 15		

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect :—

* *Recommended for acceptance.*

ARISTOTLE-ROAD SCHOOL.—Accommodation—Boys', 226; girls', 226; total, 452. Senior Mixed School on two stories. Hall—Boys' and girls', 60 ft. by 29 ft. 7½ in. Classrooms—Boys' and girls', 50, 50, 48, 48, 48, 48, 40, 40, 40, 40. Schoolkeeper's house. Gymnasium, 1,800 ft. area. Heating by low-pressure hot-water apparatus :—

Holloway Bros.	£16,618	+	†£339
F. and H. F. Higgs	16,247	+	181
Lathey Bros.	16,217	+	324
W. H. Lorden & Son	15,444	+	222
J. Marsland & Sons	15,425	+	180
Treasure & Son	15,274	+	190
C. Cox	15,089	+	219
J. Smith & Sons, Ltd.	15,035	+	200
Spencer, Santo, & Co., Ltd.	15,014	+	170
W. Johnson & Co., Ltd.	14,700	+	155
E. Triggs	14,536	+	193
Holliday & Greenwood, Ltd.	14,535	+	204
J. and M. Patrick	14,359	+	212
J. Garrett & Son*	14,342	+	334

† If walls of classrooms and halls are plastered and.

BROADWATER-ROAD SITE.—Providing and erecting three additional iron buildings and appurtenances :—

Hill & Smith	£2,700	H. Harbrow	£2,350
T. Cruwys	2,560	J. McManus	2,290
Humphreys, Ltd.	2,438	Bain & Co.‡	2,040
Croggon & Co., Ltd.	2,375	Rowell & Co.*	1,920

‡ This firm has not included provisional sums in the tender.

ELM-COURT.—Providing and setting new range and feed-cistern in kitchen and gas-cooking-stove in scullery; laying on hot-water services to baths, officers' lavatory basins, slop-sink in lavatory on first floor, and to scullery sink; also providing and fixing boiler in fireplace of scullery, including builders' work :—

J. Eson	£178 0	Duffield & Sons	£129 10
Cannon & Sons	144 0	Paragon Heating Co.	119 0
Wippell Bros. & Row	143 5	J. & F. May*	115 0
Wenham & Waters, Ltd.	129 17		

GAINSBOROUGH-ROAD.—Supplying and fixing three large No. 24 "Railway" pattern stoves :—

J. Eson	£54 0 0	G. & E. Bradley	£31 10 0
Wontner-Smith, Gray, & Co.	31 11 6	Defries & Sons, Ltd.*	29 0 0

HACKFORD-ROAD (Boys').—Altering position of an existing partition and providing and fixing a glazed partition to re-divide classrooms C and D into three rooms; also providing Tobin tubes :—

Lathey Bros.	£149	W. V. Goad	£117
Garrett & Son	125	Rice & Son	113
Maxwell Bros., Ltd.	125	E. Triggs*	105

NORTH END-ROAD (Boys').—Altering position of an existing partition and providing and fixing an additional glazed partition to re-divide classrooms C and D into three rooms; also altering classroom doorway, &c., in connexion therewith :—

Williams & Sons	£245 0	General Builders, Ltd.	£159 0
W. R. & A. Hide	190 0	Chinchen & Co.	158 0
G. H. Sealey	183 0	S. Polden*	149 15
W. Hammond	176 0		

The interiors of the following schools will be cleaned between December 14, 1901, and January 4, 1902 :—

ASHBURNHAM :—

T. Cruwys	£485	W. Hammond	£315
O. Craske	325	C. Gurling*	279

§BEN JONSON (Boys', Girls', and Infants').—Cleaning interior and painting exterior :—

A. E. Symes	£865 0	J. T. Robey	£700 0
W. Hornett	810 17	Barrett & Power*	670 0
Stevens Bros.	730 0		

BROAD-STREET :—

A. W. Derby	£406	J. T. Robey	£314
Johnson & Co.	400	Corfield & Co.*	225

BURGHLEY-ROAD (Old Portion) :—

G. Kirby	£438 0	Stevens Bros.	£394 0
Wall & Co.	434 0	Chinchen & Co.	379 10
T. Cruwys	420 10	Marchant & Hirst*	369 0

CAVLEY-STREET :—

A. W. Derby	£261 0	Gibb & Co.	£231 0
Dolman & Co.	239 10	J. T. Robey	227 6
A. E. Symes	235 0	Haydon & Sons*	190 10

CHAUCER :—

J. Watkins	£525 0	H. Line	£270 0
Johnson & Co.	361 0	H. J. Williams	256 16
W. Downs	287 0	E. Triggs*	220 0
Sayer & Son	282 0		

COLLS-ROAD :—

G. Kemp	£298	W. V. Goad	£260
Rice & Son	281	H. Groves	253
H. Line	265	J. & C. Bowyer*	252

GLOUCESTER-ROAD :—

W. Sayer & Son	£392	H. Line	£306
Rice & Son	349	J. & C. Bowyer	298
H. Groves	329	Black & Son*	278
Maxwell Bros., Ltd.	329		

KEETON'S-ROAD :—

W. Banks	£425	Sayer & Son	£297
Johnson & Co.	403	E. Triggs*	290
H. J. Williams	356		

KNAPP-ROAD :—

A. J. Sheffield	£397 15	Dolman & Co.	£270 0
Gibb & Co.	379 0	J. T. Robey	256 0
T. H. Jackson	354 10	Corfield & Co.*	228 0
Barrett & Power	298 0		

LILLIE-ROAD (all Buildings) :—

Spencer, Santo, & Co. Ltd.	£345	C. Gurling	£289
J. & M. Patrick	314	W. Hammond*	289

MAWBEY-ROAD (Old Portion) :—

Johnson & Co.	£316 0 0	Sayer & Son	£150 0 0
W. Banks	187 15 6	H. J. Williams*	114 15 0
W. J. Howie	163 0 0		

LONDON.—For the supply of gravel for parks for the London County Council :—

	Battersea Park.	Chelsea Embankment Gardens.	Brockwell Park.	Clapham Common.	Kennington Park.	Myatt's Fields.	Wandsworth Common.	Dulwich Park.	Ladywell Recreation Ground.	Manor House Gardens.	Peckham Rye Park.	Telegraph Hill.	Pimlico Garden.	Hampstead Heath, &c.	Ravenscourt Park.	Waterlow Park.	Bethnal Green Gardens.	Clissold Park.	Highbury Fields.	Mill Fields.	Meath Gardens.	Victoria Park.	Churchyards in the N.E. District.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Boyer & Sons	8 0	8 0	—	—	—	—	—	—	—	—	—	—	7 6	8 0	7 6	—	—	—	—	—	—	—	—
H. W. Budd (Croydon gravel)	—	—	—	—	—	—	—	—	—	10 6	—	—	—	—	—	—	—	—	—	—	—	—	—
Do. (Crayford gravel)	—	—	—	—	—	—	—	—	—	6 6	—	—	—	—	—	—	—	—	—	—	—	—	—
J. E. Clark	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7 6	7 6	6 0	6 3	7 9	7 6	8 0	7 9
Crayford Land and Brick Co.	6 9	7 6	6 9	6 9	6 9	6 9	7 0	7 0	6 9	6 6	6 9	6 9	—	—	—	—	—	—	—	—	—	—	—
Crayford Sand and Gravel Pits Co.	6 4	6 10	6 4	6 4	6 4	6 1	6 10	6 4	6 2	5 3	6 4	6 10	—	—	—	—	9 4	9 4	—	—	—	9 4	—
Fry Bros. (Faversham gravel)	—	—	11 0	11 0	10 0	9 6	—	10 0	8 6	8 6	9 6	9 0	—	—	—	—	11 0	—	—	—	—	—	—
Do. (Dartford gravel)	—	—	10 6	10 6	9 6	9 0	—	9 6	8 0	8 0	9 0	8 6	—	—	—	—	10 6	—	—	—	—	—	—
J. Guyatt	7 9	8 6	7 3	7 0	8 6	8 6	7 0	8 6	—	—	8 6	9 0	8 6	—	—	—	—	—	—	—	—	—	—
G. Neal	7 6	8 0	8 6	7 6	8 6	9 6	7 0	9 6	—	—	—	—	8 6	—	8 6	—	—	—	—	—	—	—	—
D. R. Paterson	—	—	—	—	—	—	—	—	—	—	—	—	—	8 3	—	9 6	—	8 3	8 0	—	—	—	—
E. Smallwood	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7 0	7 0	—	—	—	—
L. Sommerfeld (Greenhithe gravel)	7 9	10 0	10 6	10 6	10 0	11 6	10 6	11 0	11 0	12 0	11 0	11 0	11 0	—	10 0	—	—	—	—	—	—	—	—
Do. (Ware gravel)	—	—	—	—	—	—	—	—	—	—	—	—	—	8 9	—	9 9	9 9	9 9	9 9	9 0	9 9	8 6	10 0
Weston & Sons	6 9	7 7	9 6	7 10	7 10	7 9	7 4	7 9	7 2	7 2	7 9	6 11	7 7	—	7 4	—	9 4	—	—	9 4	9 4	9 4	9 4

[On the recommendation of the Parks and Open Spaces Committee of the Council it was agreed, "That, subject to the usual inquiries, the tender of the Crayford Sand and Gravel Pits Co. to supply gravel to the places south of the Thames at the prices set out in the above table, the tenders of Messrs. Boyer & Sons and Messrs. J. Weston & Sons as regards Pimlico Garden and Ravenscourt Park respectively, and the tender of Mr. J. E. Clark as regards Waterlow Park, Bethnal Green Gardens, Clissold Park, Highbury Fields, Mill Fields, Meath Gardens, Victoria Park, and the various churchyards in the north-east district be accepted." Inasmuch as the price quoted in the lowest tender for the supply of gravel at Hampstead Heath is rather high, the Committee propose to invite prices afresh for the supply of gravel to this place.]

[See also next page.

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BRUSHES, &c.—Supply of the following articles, on running contracts :—

Contractors.	Sash Tools. No. 3.		Sash Tools. No. 4.		Sash Tools. No. 5.		Sash Tools. No. 6.	
	Hamilton's	Kent's	Hamilton's	Kent's	Hamilton's	Kent's	Hamilton's	Kent's
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Atkins, Bussell & Co. .. Per doz.	4 5	—	5 6	—	8 0	—	10 0	—
T. & W. Farmiloe, Ltd. ,,	3 9	3 9	4 9	4 9	7 2	7 2	8 10	8 10
Hamilton & Co.‡ .... ,,	3 6	—	4 4	—	6 4	—	8 0	—
Kent & Sons, Ltd. .... ,,	—	*3 6	—	*4 3	—	*6 6	—	*8 0
Nicholls & Clarke, Ltd. ,,	4 3	3 9	5 0	4 9	7 6	7 3	9 6	8 9

Contractors.	Sash Tools. No 7.		Sash Tools. No. 12.		Brushes. 8-o ground.	
	Hamilton's.	Kent's.	Hamilton's.	Kent's.	Hamilton's.	Kent's.
	s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Atkins, Bussell & Co. ....per dozen	13 6	—	1 15 0	—	3 8 0	—
T. & W. Farmiloe, Ltd..... ,,	12 0	12 0	1 10 0	1 10 0	3 14 6	3 14 6
Hamilton & Co.‡..... ,,	10 8	—	1 8 0	—	3 1 6	—
Kent & Sons, Ltd. ..... ,,	—	*10 9	—	*1 6 9	—	*3 2 0
Nicholls & Clarke, Ltd..... ,,	12 9	12 0	1 13 6	1 9 6	3 8 9	3 8 9

‡ This firm has also submitted the following quotation for the "Atlas" Brand of brushes :—No. 3, 3s. ; No. 4, 3s. 8d. ; No. 5, 4s. 10d. ; No. 6, 6s. ; No. 7, 7s. 8d. ; No. 12, £1 ; and 8-o ground, £2 9s. 6d. per dozen.

MUNSTER-ROAD :—
Lathey Bros. ..... £265 | W. Hornett £239
J. & M. Patrick .... 265 | W. Hammond* 235

NAPIER-STREET :—
G. Barker..... £387 | McCormick & Sons* .. £353

QUEEN'S HEAD-STREET :—
Dearing & Son ..... £295 | Grover & Son £267
C. & W. Hunnings .. 273 | McCormick & Sons*.. 246

SCARSDALE-ROAD :—
W. V. Good ..... £295 0 | Maxwell Bros., Ltd. £247 0
Lathey Bros..... 293 3 | E. Triggs 242 0
H. J. Williams*..... £225 0 0

SHERBROOKE-ROAD (all Buildings) :—
T. Cruwys..... £442 0 | C. Gurling* £295 10
W. Hammond 323 0

§SURREY-LANE.—Cleaning interior of school and painting interior and exterior of manual training centre, laboratory, and art-room :—
W. Hornett ..... £588 0 | Bulled & Co..... £419 0
Rice & Son ..... 449 0 | E. Triggs 400 0
Bristow & Eatwell 445 0 | Maxwell Bros., Ltd.* 364 15

TURIN-STREET :—
Collis Willmott & Son ..... £337 10 | W. Shurmur* £324 0
Corfield & Co. .... 330 0 | Vigor & Co. 310 0

WINCHESTER-STREET :—
Dearing & Son .... £337 0 | Stevens Bros.* £226 0
C. & W. Hunnings 259 8

WOOD-STREET :—
W. J. Howie..... £363 0 | J. & M. Patrick .. £269 0
W. Banks ..... 337 10 | H. Groves 243 10
Hayter & Son .... 281 0 | E. Proctor* 239 0

§ The exterior painting in these cases will be executed at Easter, 1902.

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The Builder.

VOL. LXXXI.—No. 3378. DECEMBER 21, 1901.

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The Liverpool Cathedral Question.

WE mentioned in our issue of December 7, when giving Mr. Bare's plan for a rearrangement of the proposed cathedral site at Liverpool (page 511 *ante*), that we had reason to believe that there would be a more systematic opposition to the scheme of the Cathedral Committee than they could well afford to overlook. Since then we have received from the "Liverpool Cathedral Petition Committee" a pamphlet containing their views, and a collection of opinions extracted from various papers and periodicals, in opposition to the Cathedral Committee's proposals, and accompanied by a letter in which they specify the line of action which they intend to take, and their reasons for it. With the pamphlet is bound up a plan of a portion of the city of Liverpool, of which a reduced copy will be found on the next page (fig. 1), and which is intended to show the specially advantageous position of what is called the Monument-place site, the one favoured by the Petition Committee.

The name which is assumed by this committee indicates the line of action which they intend to take if it should become necessary. A Bill in Parliament will be required to authorise the Cathedral Committee to take the St. James's Mount site for the proposed cathedral, and the opposition committee has been formed with the intention, if persuasion and public opinion fail to produce any effect, to petition Parliament against the Bill. The position which the Petition Committee take may be best set forth in their own words:—

"The Petition Committee are not antagonistic towards the erection of a cathedral in Liverpool if it is to be placed upon a suitable site and to be of a worthy character; but they will, as far as they are able to do so, strenuously oppose the foisting upon the nation of a poverty-stricken new cathedral, a site even for which the promoters of the scheme allege they cannot afford to purchase at a comparatively few pounds per yard.

If it be true, as alleged, that there cannot be a cathedral at all unless upon a practically free site, its cheapness due to the deprivation of the citizens of Liverpool of one of the few public recreation-grounds and open spaces which still remain within the heart of the city, then, in the name of the true religion of the nation, the Petition Committee protest against such holding up of the nation to international scorn; and they say 'in that case, better no cathedral.'"

Some of the expressions used in the above quotation may be thought rather exaggerated; but with the closing words we are entirely in agreement. The Cathedral Committee do not understand their business, and have gone into the matter in a wrong-headed and totally ignorant manner from the first. They commenced by entirely ignoring the architect whose design was practically selected in the first competition, and who had every right to expect that he would be the first person consulted in any revival of the scheme for a cathedral for Liverpool. By asking for designs in a special style, and that style the Gothic, they showed themselves entirely out of touch with modern thought and principle in architecture, as well as oblivious of the fact that the requirements of modern worship are in some very important points quite different from those which a mediæval cathedral was built to serve; and on this point of demanding a special style they have been compelled formally at least to give way, though we fear that they are not less determined to select a mediæval design when the time comes, or to select as final competitors those architects who are obviously mediæval in their architectural faith and tendency. They have persisted, in the face of unmistakable expressions of public opinion, in selecting a site which affords no proper view of or approach to the cathedral, and where it would be out of the way of public notice and convenient access—a site, in fact, in which a first-class building, if obtained, would be entirely thrown away; and all this on the miserable ground of economy; as if there could be any use in the world in attempting to build a cheap cathedral. We hear, from private sources, that the Cathedral Committee calculate, after having obtained their cheap site, on erecting the building for 350,000*l*. If they think that anything worthy of the name of a first-class cathedral can be carried out for that sum they are wofully mistaken—not a penny under the half-million will do it. And is Liverpool, one of the largest and most important cities in the kingdom, to be put off with a second-class cathedral? We do not think that public subscriptions will be forthcoming, on any large scale, in support of such a *fiasco* as this would be. The question does not concern Liverpool only; it concerns the whole country, and more especially all those who are interested in modern English architecture. The manner in which this proposed cathedral is carried out, in regard to scale, style, and design, will have a very important bearing on the advance of modern architecture in this country, and more especially, of course, on church architecture, which at present is by no means in a satisfactory condition.

Turning to the plan which we have reproduced, we may point out the peculiar advantages of position which the Monument-place site affords. It is very near the largest and most central railway station, the London and North-Western terminus at Lime-street; the one by which nearly all visitors from the capital would arrive; for the Midland Railway route from London to Liverpool, though a picturesque, is a roundabout one, and takes considerably longer to travel over. The principal road eastward out of Liverpool, with a tramway route, runs past the north side of the site. The cathedral could be built there with the usual orientation, its entrance front facing west and the choir to the east, while on the site proposed by the Cathedral Committee it is admitted that the building would have to be built with its longer axis north and south; and though, as we have before said, this point is not of the first importance, it has a sentimental value to a good many people, and it would certainly seem a pity that the cathedral should form the one exception among English cathedrals to the east and west position. But the architectural advantages of the Monument-place site (if indeed that of aspect may not be counted among them) are even more important. As will be seen from the plan, the main route

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Fig. 1.

from the landing stage at the river would lead directly up to the cathedral, and leads past the Town Hall, the Municipal Offices, St. George's Hall and the group of the Art Gallery and Public Library; so that the cathedral would in this sense be placed in relation with the other principal architectural monuments of the city, and it would be visible from the point between St. George's Hall and the Library group, which may be called the architectural centre of the city, and would have in front of it a wide street leading right up, centrally, to its main façade. The monument, of course (if retained), would have to be moved so as to be on the axis of the cathedral: it is not shown so on this plan.

The St. James's Mount site does not come into this map; it is situated considerably more to the south, and those who know Liverpool will remember that it is not on any important line of route, nor would the cathedral be grouped or connected with any other of the leading buildings of the city. The plan of the site and its approaches, which we also reproduce from the Petition Committee's pamphlet (fig. 2), shows only too plainly how completely unsuited is the site for any architectural effect for a large cathedral. There is no road leading up to it; not point from which an effective distant prospect of it can be obtained, and its west side (what is ritualistically the south side) faces a collection of poor and narrow streets. As far as architectural effect is concerned there could not be a worse site for an important building, and it is in an out-of-the-way neighbourhood. To build a new cathedral in that situation in Liverpool would be the same kind of thing as if we were to build a new one in London in an out-of-the-way square in Bayswater. The distance from the most important centres is not so great, of course as that would be—distances are so much greater in London; but that supposition conveys about the nature of the site in relation to the more prominent and frequented portions of Liverpool. This should be understood, because subscriptions will no doubt be sought for from the country generally as well as from the Liverpool neighbourhood, and it is no use subscribing towards what, though a cheap cathedral, will for that very reason be a costly mistake.

It may be useful here to reprint the petition to Parliament which the Petition Committee propose to present should all other means of persuasion and argument fail in inducing the Cathedral Committee to change its course. It is as follows:—

"*Objections to the Present Scheme for a Cathedral in Liverpool.*

The following are some of the objections to th present scheme for a cathedral in Liverpool, viz.:—

1. That the site selected, known as St. James' Mount, is—

NOT CENTRAL;
NOT READILY ACCESSIBLE;
NOT COMMANDINGLY PROMINENT;
WITHOUT VISTAS.

2. That the site selected is a public garden and recreation ground.

That it is an open space.

3. That the ratepayers of Liverpool would be practically contributing to the cost of the cathedral were St. James' Mount site granted at the price suggested.

4. That there is available a site, known as Monument-place site, which possesses none of the above

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Fig. 2.

objections, and is, in fact, the site originally selected by the Cathedral Sites Committee.

5. That Monument-place site is central, is readily accessible by road, rail, or tram from every part of the Diocese of Liverpool, and is near to the principal railway stations, and within easy distance of the Landing Stage.

6. That Monument-place site is commandingly situated, physically; abuts upon the London-road, which is the main thoroughfare in and out of Liverpool, and is passed daily by thousands of people in following their ordinary vocations.

7. That there is a vista extending for nearly half a mile, which would be terminated by the west end of the Cathedral, were Monument-place site adopted; and the Cathedral would form the crowning feature of lines of streets, over a mile in length, commencing at the landing stage and river-side station, and passing the following public buildings, viz.:—

Town Hall;
Municipal Offices;
Government Buildings;
New General Post Office;
Magistrates' Courts and Police Offices;
Technical Schools;
Brown's Museum;
Free Library;
Picton Reading-room;
Walker Art Gallery;
St. George's Hall;
Queen Victoria's, Wellington's, and other monuments.

Whilst in close contiguity with the site are:—
The Royal Infirmary;
The Liverpool College;
The University College.

8. That the methods adopted by the Cathedral Committee for obtaining a design for the Cathedral are unlikely to result in the best design being obtained, and consequently the money of the subscribers would not be expended to the best advantage."

The Petition Committee have sufficient funds in hand to enable them to lodge a petition, but they will not do so unless they feel assured of the support of the country generally, by having guaranteed to them sufficient funds to conduct an exhaustive and effective enquiry, if necessary, into the whole case; they have no wish to oppose the Cathedral Committee except with a view of ensuring that the cathedral to be erected in Liverpool shall be a noble structure, and placed upon the best site. They would therefore be glad to have the views of subscribers, of architects, and of the general public, on the whole subject, and the line of action which they are proposing to take in reference to it. We shall be very glad to find room in our columns for any correspondence on the subject from those qualified to deal with it.

NOTES.

Wireless Telegraphy. We see no reason to doubt the statement made this week that Mr. Marconi has succeeded in sending signals through space from Cornwall to Newfoundland. We know that messages have been sent hundreds of miles over the sea by very ordinary apparatus, and hence it is not incredible that the very powerful apparatus used by Marconi should have sent signals thousands of miles. The Hertzian waves following the contour of the ocean must lose very little by absorption. The experience gained in South Africa showed how rapidly the waves were absorbed when passing over dry soil, and hence this kind of telegraphy will probably be mainly used for over-sea working. What is still wanted, however, is a proper system of tuning. Marconi's system of tuning is only partially successful; his receiving instruments successfully disentangle two messages sent simultaneously from two separate sending instruments, but both messages are received on any other instruments between the two stations. What is wanted is a system of perfect tuning, so that the message sent out by a particular instrument will be read by a particular receiver and by that receiver only. We are aware that several electricians are experimenting in this direction, but most of them seem to do their tuning by trial and error. It seems to us that a better way would be actually to measure the capacity to earth, and the inductance of the receiving and sending apparatus respectively. Then if the product of these two quantities is the same the instruments are in tune, no matter how they differ in other respects. Unfortunately very few practical men know how to measure or to calculate either capacity or inductance, although methods of doing both are fully described in Dr. Fleming's recent "Cantor Lectures on Wireless Telegraphy."

The S.C.A.P.A. Society. The Society for Checking the Abuses of Public Advertising held a special meeting on Monday last, to receive the formal resignation of their former President, Mr. Alfred Waterhouse, rendered necessary by his ill-health. The Society in great measure owes its existence to Mr. Waterhouse, who as President spared no pains to assist its objects both by his influence and advice, and by cordial and punctual collaboration at its meetings; and a letter of gratitude and sympathy with him was read and passed, and the hon. secretary requested to communicate it to him. In his place Dr. Longstaff has been elected President, and a better choice could hardly have been made. Dr. Longstaff has been a member of the Society from the first, and is greatly interested in its objects; and his businesslike character, as well as his important position in the London County Council, will probably enable him to render valuable assistance to the cause. The Society has already accomplished more than could have been expected during the comparatively short time that it has been in existence, considering the great phalanx of prejudice and of commercial interests against which it has had to contend; and by being the indirect means of leading the Dover Corporation to obtain an Act for regulating advertisements and sky signs, it has established a precedent which other municipalities may well be invited to follow. The subject is of special importance just at the time when so much is about to be done in London in laying out and building new streets. If we are to expend money in improving and adding to our street architecture, let us at least provide that it shall not be spoiled and vulgarised by the hand of the advertiser.

Projected Improvements in Paris. It is proposed to extend the already lengthened perspective of the Avenue des Champs Elysées, which stretches from the Tuileries to the "rond-point" of Courbevoie (where stands Ernest Barrias' monument "De la Défense"), by a great avenue from the latter point to the Seine, between Bezons and Nanterre—that is to say, to the extreme boundary of the Department. On the right bank of the river the lugubrious St. Lazare prison, of unhappy memory, is to give place to a new square to be formed on its site. These are the principal operations comprised in a large scheme for new works recently submitted to the Conseil-Général of the Seine, and which will involve an expenditure of 180 million francs.

Aluminium Alloys. The paper on the physical properties of certain aluminium alloys recently read by Professor E. Wilson, of King's College, to the Institution of Electrical Engineers contains many data which will prove of the greatest use to electricians. The purest commercial aluminium contains traces of iron and silicon, so that practically the metal is always used in its alloyed state. Pure aluminium is bulk for bulk less than one-third the weight of copper, its co-efficient of expansion by heat is 50 per cent. greater and the resistance it offers to an electric current is 60 per cent. greater. A copper wire a square inch in section will break down when it supports a weight of 64,000 lbs., but 28,000 lbs. will break an aluminium wire of the same section. Professor Wilson has made exhaustive tests on twenty-four samples of aluminium wire, each of which has been alloyed with 1 or 2 per cent. of various metals. When alloyed with 2 per cent. of copper the breaking load is increased to 40,000 lbs., and the electric conductivity is increased 20 per cent. Hence it seems to us that for electrical purposes an aluminium alloy containing about 2 per cent. of copper would be very much more useful than pure alu-

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minium. On increasing the percentage of the copper in the alloy very little is gained in either tensile strength or conductivity. An alloy containing 1·3 per cent. of nickel and 1 per cent. of copper gave a breaking load of 46,000 lbs., which was the highest figure obtained. Its conductivity, however, was low. Professor Wilson's experiments prove that for use as overhead conductors whether for telegraphic or power purposes, several of the alloys he describes are superior to copper. Although the arts of soldering and welding aluminium are now well known, yet the construction of mechanical joints has been so perfected that there are power transmission lines in America nearly a hundred miles long where only mechanical joints are used. For equivalent conductivity aluminium is slightly cheaper than copper; still, as the world's output of the former is only about 2 per cent. that of the latter, fluctuations in the price of aluminium will not have much effect on the price of copper.

Telegraph Wires.

The wholesale destruction of telegraph connexion by the recent storm emphasises in a very complete way the need for the gradual abolition of overhead wires on trunk lines, for the stoppage of telegraphic communication is positively for the time a national trouble. It is obvious that the more numerous wires become the heavier is the load which the poles have to bear when, as in the recent storm, the wires become covered with moist snow, which presently freezes, causing a heavy and compact mass to extend from pole to pole. There is really no difficulty about underground wires in rural districts and along railroads, but we suppose it will require another storm or two before the necessity of the abolition of overhead wires becomes clearly apparent to the Postmaster-General. We hope that in the ensuing Session attention will be called to this important subject.

Chorlton and Manchester Asylum Competition.

We may commend to the notice of architects who patronise competitions the invitation of the Chorlton and Manchester Joint Asylum Committee to architects, now appearing in our advertisement columns, to submit designs for a proposed new set of "colony" buildings to be erected on a site of some 165 acres of land at Langho, near Blackburn, to receive the imbeciles, idiots, and epileptics—sane and insane—now in the workhouses of those two Poor Law districts. The scheme, which is to comprise accommodation for some 700 or 800 patients, has some points about it that are quite novel in this country, at least so far as number of patients and diseases is concerned. The arrangement of the accommodation is to be in a series of "homes," each holding from 25 to 50 or 60 patients, the "homes" being grouped in "villages" for the respective classes instead of a range of large buildings on the usual asylum plan. There is but little information to be gathered as to the working of this new system from existing institutions for the classes of patients in question in this country; but the system has been in operation for some years in Germany and also in the United States, and it is described, with more or less detail, in "The Care and Treatment of Epileptics," 1900, and "The Insane in Foreign Countries," 1889, by William P. Letchworth, LL.D.,* and is briefly referred to in Mr. Gordon Smith's recently published book on Poor Law buildings. The Joint Committee have prepared a creditable set of conditions and instructions to competitors; they offer three prizes—200*l.*, 150*l.*, and 100*l.*—for the best three designs; they promise the work to the author of the best design (provided he is able to satisfy them as to his ability, fitness, and experience); and they have engaged Mr. Gordon Smith to advise with them in the selection of a design. The plans are to be drawn to one-sixteenth scale, to be delivered in portfolios—not on straining frames—and no perspective views are to be sent in. Four months are allowed for the preparation of designs, and altogether the competition appears to deserve success.

The Pimlico Gasworks, Bessborough-street.

In the course of next February the Gas Light and Coke Company will offer for sale at the Auction Mart, Tokenhouse-yard, their property, being for the greater portion freehold, by the riverside at Pimlico. The gasworks, with offices, workmen's dwellings, weighbridge, &c., cover an area of 4 acres, having a wharf frontage of 320 ft. to the Thames and a tunnel underneath Grosvenor-road. The buildings stand between Bessborough-place and Pulford-street, on the north-eastern side of St. George's-square. The gasworks were originally established there about seventy-five years ago on the two banks of the Tyburn, near Vauxhall Bridge. In an excellent map surveyed and drawn by W. B. Clarke, the architect, and published in 1836, the "gasworks" and "gas factory" are plotted as lying on the northern and southern banks, respectively, of the Tyburn stream, just above its outfall into the river at Thames Bank Wharf, in (old) Millbank, since renamed Grosvenor-road. The stream at that point ran by the Sluice-house, and the King's Scholars' Pond from which the sewer afterwards took its name.

"Bunyan's Chapel," Southwark.

An old timber-built tenement in King's-court, Great Suffolk-street, will shortly be demolished. It stands opposite the site of the Bridewell that was built *circa* 1773 upon Hangman's Acre, where is now the junction of Friar and Hill streets. The house was taken just 100 years ago by a congregation who had separated themselves from the Baptist community in Union, formerly Duke, street. A tradition is current that Bunyan sometimes preached in the meeting-house in King's-court, as well as in that belonging to his friend Dr. Thomas Barlow, in Zoar-street, Slutswell (since Gravel-lane), in the course of his frequent visits to London.

Japanese Cloisonné Enamels.

At Willis's Rooms, St. James's Mr. Ando has had on view a fine collection of Japanese cloisonné enamels, mostly his own work. The most interesting piece was a small model of a mandarin duck by Ando, a masterpiece of enamel colour. In the same case was a cloisonné silver vase decorated by a group of gold fishes in water, beautifully drawn in transparent tints. A pair of vases of "wireless cloisonné" showed a charming composition of a winter view with crows and snow-covered bamboos in cold greys. The many other examples by the same artist illustrate his skill in obtaining delicacy and depth in all his colours rather than success in their use in design, and we wish for that conventionality and subtlety of composition which is so characteristic of the best Japanese art. The gradation of tone, the clever use of copper and silver backgrounds, and the pure transparency of the enamel necessary to give these their full value are proof of his mastery of the materials used. The use of wireless cloisonné, and its combination with wired and embossed details, are shown in many examples with varied success. There is a tendency to break away from the best traditions of the art, an influence which cannot fail to bring its quota of failures when exercised by an artist of such versatility. When Mr. Ando has felt the limit of his palette, we hope to see his work again. A pair of large vases by Gonda, decorated with autumn shrubs and birds, all wired on a black background, are splendid pieces, drawn and coloured with marvellous lightness. An incense burner by Honda, of conventional design and restrained tints, shows a true feeling in colour. In some of the other examples by Honda we also miss that spontaneity of balance which is wanting in some of Ando's compositions. Than Japanese there is no art more sensitive to the unfitness of outside influence, and it will be a dark day in its history when it allows an overstraining after the popular and the new to break through and spoil its purity, reaping only that benefit which is won by the cupidity of commercialism.

*Putnam's Sons, New York and London.

Bridges in Landscape.

A correspondent writes to us that we have done an injustice to Mr. Pittman, the winner of the Turner gold medal at the Royal Academy, by describing his picture as representing Putney Bridge and its neighbourhood, and accusing him of not having done justice to the bridge, as his scene really represented new Battersea Bridge. This we find is correct, but the mistake would not have been made if the bridge had been more correctly represented in the picture. The composition, with a suspension bridge in the distance and a stumpy church tower on the left, we took to be a view up the river, with Hammersmith Bridge in the distance and Putney Church on the left; it appears it is a view down the river, with Chelsea Suspension Bridge in the distance and Chelsea Church tower on the left. But the point is that Battersea Bridge is a bridge with stone piers and steel spans, and there was no indication of this in the picture; the bridge seemed all of one material, whatever it was; and that is exactly what we complained of; landscape painters treat a thing like a bridge without giving any indication of its structural character. Turner himself, no doubt, would have done the same; but that does not make it right. A more curious thing, from our point of view, is that an artist who had, by the terms of the competition, a choice of any of the Thames bridges as the central object of the composition, instead of selecting one of the really fine stone bridges, should have chosen such a piece of tawdry sham structure as Battersea Bridge, a thing which is a horror to every architect. This is no disparagement to Mr. Pittman's picture as a whole; it is a fine work with much future promise; it is the bridge alone that we

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object to. A bridge, if introduced into a landscape, should at least appear to have some structural character, and not be treated as if it were cut out of a piece of cheese.

THE ETHICS OF DILAPIDATIONS.*

THE cause of dilapidations is the improper use or improper care of premises. Now a man usually takes a house or a shop or a factory on lease to use the building for the purpose it was built for, or for which it has become adapted.

When I see some schedules I think, had the tenants known what was in store for them they would have hardly dared to inhabit the premises. Now when a man hires an article under the ordinary conditions he has a right to the reasonable use of it for the purpose that caused him to hire it. I believe if a man hires a horse for hunting, the purpose is known, and should the horse be killed the hirer is not liable for the cost. Again, if I hire a bicycle I do not expect when I return it to the shop that the man will go carefully all over the frame to see if there is the slightest chip off the paint and then to demand the cost of re-enamelling the whole machine; neither do I when I return it expect to have the cost of cleaning it added to the hire, even though the day has turned out wet and the cycle is covered with mud. If I puncture or break anything, certainly I pay.

Why should not a man have the same rights when using a building as he has when using a bicycle? In other words, has he a right to ordinary wear and tear? What is the meaning of "fair wear and tear"? If ever a phrase were invented to trouble surveyors, that is the one. I tried hard to find some origin or derivation of wear and tear, but could not do so, finally I wrote to the editor of "Notes and Queries" and explained that "wear and tear" was constantly used with reference to substances that one could not, from the nature of them, "tear," *e.g.* stone paving, and could he help us to find out how the expression had become general. The reply I received was this:—"A proverbial locution such as this ceases naturally in time to be confined to its first signification, and becomes a synonym for use."

I am afraid that does not help us very much. I looked up some law authorities with little result. A law dictionary defies wear and tear as "the waste of a substance by use," a good definition, but not touching the accepted meaning of the words taken singly. Woodfall is silent on the subject, so is Macer; Banister Fletcher refers to machinery.

The only case I can find on the subject is Scales *v.* Laurence (2. F. & F., 289). There was no express covenant to paint in certain years, the tenant had well and sufficiently to repair, uphold, sustain, paint, glaze, cleanse, scour, and keep and leave the premises in such repair, reasonable wear and tear excepted. It was held that if the tenant had repaired within a reasonable time before leaving, he was only bound, in addition to the repair of actual dilapidations, to clean the old paint, &c., and not to repaint.

Surveyors differ as much as possible, one man will contend that the phrase, "fair wear and tear excepted," will, like Charity, cover the multitude of sins his client may commit, and another surveyor will say the words mean just nothing at all, and they might as well be omitted.

What is a "fair tear?" One, of course, thinks of wall papers in connexion with tearing, and I know of no fair tear unless it be a nail hole for hanging pictures, which a tenant has a perfect right to make.

For "it is a monstrous thing to say that because a person puts nails into the walls of a house he must take them out and fill up the holes, or commit a breach of the covenants of a repairing lease" (Perry *v.* Chotzner, 9 T.L.R., 488).

But surely every tenant should have a right to the ordinary wear and tear of the premises leased to him, no matter what the covenants may be, special or general.

And whether we admit this principle or not, we certainly accept the idea, because if a floor or paving is only worn we do not ask for a renewal. But in making surveys we should not accept this matter of renewal as an inviolable rule. We ought to be governed far more than we are by the locality and character of the premises, and to consider carefully the purpose they are used for, and more particularly if they are used in accordance with the intention of the parties at the time of the demise. We are too fond of taking rules for survey from some one else, the pupil works according to his master's ideas, too often formed and set, he starts practice and uses the same rules, never thinking out the subject for himself. Or, perhaps, he hears that some authority, a well-known surveyor, has a certain rule, and he at once adopts it, and is glad to do so, and always quotes his authority, "Mr. So-and-So does, so and so do I. What is good enough for him is good enough for me," &c. I refer to such rules as asking for a window to be reglazed if cracked across from opposite sides, but to pass it if the crack is across a corner. Or, again, to condemn a chimney-stack or wall if it is so many inches out of the upright in so many feet, or to always ask for regraining if the premises have been grained previously, and entirely without reference to the covenants.

All these matters and many others should not be governed by a universal rule, but should be thought out with reference to the age, locality, and character of the property, but having, of course, due regard to the covenants.

Let me give two instances. Take the case of a house built and let when new and perfect as a school or factory. In the course of a few years the sills of the entrance doors will be worn away, we will say some inches, and form that inverted-arch appearance we often see. Although there is no actual breakage, that wearing away has been done by the proper use of the building for the purpose for which it was let and is no dilapidation. But if a house in the West-end, also newly constructed, is let for domestic purposes, and the sills become worn almost away, in consequence of the house being used for meetings, business, or charitable purposes, for which it was not leased, I contend that a surveyor would be justified in considering the sills in the latter case to be dilapidations, although not broken, and even though they be far less worn away than the sills at the school which he should pass.

A better instance is, perhaps, a staircase in a school or a factory; the treads would naturally become very much worn, the building being used, and properly so, for business purposes, and the wear is a perfectly right one, but if a house in Grosvenor-square had a staircase with treads even less worn, I think a surveyor would be entitled to consider the defect a dilapidation, because in the latter case it is usual to cover the stairs with carpets and so avoid almost any wear, the treads at the end of the term should be in practically as good a condition as at the commencement.

This brings me to another accepted tradition, if a tread is worn away at the edge the rule is to ask for a new nosing. The surveyor writes, "Renew nosings to treads" in almost any building, but although that may be a good remedy for a defect in business premises it is not a proper remedy for high-class residential property. A nosing to a tread never fits properly; where it joins the tread, it may be the same thickness near the strings; but in the middle, where the tread becomes worn, there is a difference in the thickness, and there is a sharp edge for about a foot or more in the length. This is felt when walking on the staircase, and when carpets are laid down, in a very short time they get worn along this line, and the money that should have been expended in properly repairing the staircase is thrown upon the cost of renewing the stair-carpets, and the outlay increased considerably. Again, the joint always shows at the side, whether the margins are painted or not, and is unsightly. I contend that a new tread in good property should be asked for. But even if much more worn in business premises, that even a nosing cannot be claimed.

With regard to this damage to business premises when legitimately using them, I had an instance not long ago at a factory for binding books. The building was let for that purpose; it was an old building in the City, and never had been and never could be used except as a warehouse or factory; there were benches all along the walls, and when the paper was held in the hands of the workers for binding, the glue had dropped on the floor. Each floor was marked from end to end with a ridge of glue some inches high. I had this glue carefully cleared away, and, to remove it properly, it had to be chipped off the floor with a chisel. The result was the floor showed the chisel marks and was uneven and stained, but nowhere worn through or broken. I acted for the lessee, and contended that, as a warehouse or factory floor, it was in a good condition. The surveyor for the lessor asked for a new floor to be laid along the part in question. There could be no dispute that an incoming tenant might not take the building as it was, because of these stains and marks. In a private house his demand would have been a proper one, but in this case I consider it was not.

I have a case of dilapidations going to the Courts shortly in which I act for the lessor. It is a factory, and had I estimated on the above lines, my estimate would be three or four times the amount it is, and I should not like to face cross-examination.

These remarks also refer to the class of work that one may pass. It is wrong to expect the best paint or other work in inferior property, and to refuse to pass it unless it is up to a high standard (Proudfoot *v.* Hart).

In this paper please do not think I hold a brief for the tenant; but there seems to be a general tendency at the Courts to deal lightly with a lessee, and surveyors are following this inclination at a distance. I want to draw attention to a few matters quite impartially.

One rule seems to be adopted by the profession with regard to casement windows when the wood sill and the lower ends of the frame and mullions have become rotten. I think the recognised custom is to ask for a new sill, and to cut off the rotten parts of frame and splice them and make good to the sill. What is the result? You have a nasty splayed joint showing through the paintwork on each side. If a frame has become defective from want of paint that the lessee should have applied, surely he ought to renew the whole article and not patch it. This applies also to sash frames and frames of external doors. But this is not always done. We as a profession allow this patching, and I suggest we should not do so. We should not do so in other cases. If my coat is torn by a stranger I want the cost of a new coat. I cannot agree to his suggestion that it is only a little tear, and his tailor will stitch a bit in the middle of the back, and it will not show much. Neither will the patched window last as long as a proper whole although old one. This is not a case that should vary with locality, it is a defect in the structure arising from neglect, and should be properly remedied. At the same time, if the rot occurs where it cannot be avoided, as in posts to field gates, then a repair should be passed. Rotten casements and sashes are sometimes passed if repaired by angle irons securing the work which has become dilapidated and worthless. This should not be allowed any more than we should allow zinc or lead to be nailed over a rotten sill.

The surveyor's lot is often a difficult one. For many weeks past I have been employed surveying property that has been neglected for very many years—it is not a case of lessor and lessee, but somewhat similar—and it is extremely difficult to decide in cases of very bad structures when to allow for repairs and when to estimate for entirely rebuilding.

Now one very serious, because expensive, part of our work deals with repairs to brickwork and the question of rebuilding. The portion of premises usually under observation in making a survey are:—

1. Parapets out of the upright.
2. Chimney-stacks out of the upright.
3. Bulged walls.

Day after day surveyors go to buildings, note a leaning over of the parapet or chimney stacks, and without a moment's hesitation note down the item and ask for rebuilding. It is their rule, they never think about it; *why* they should do it, there it is, a fact, out of the upright, and the note is made, "Take down so many feet, &c."

Now let us look a little into this. If the building is a new one I think we can agree that these defects are caused by the bad construction of the property, and if old it is only carrying the argument a little farther to see that had the building been constructed in a stronger manner the defect could not have occurred a the date of the survey. I assume that he tenant has pointed the wall, that is all in the ordinary way he could do to repair brickwork, and if a parapet is

* A paper by Mr. Sydney Perks, read before the Architectural Association Discussion Section on the 6th inst.

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too thin no amount of pointing will keep it upright. I believe the usual cause of parapets leaning over either towards the house or away from it is the thrust in consequence of the construction of the roof. If the parapet is well built in at the ends it will lean inwards; we often see a long length of parapet wall 9 in. thick with a heavy stone coping upon it. So in most cases, and in fact in almost any case, the result of the defect is in no way due to the neglect of the tenant; he has not gone and shoved over the wall or the chimney stack, and caused the necessity of rebuilding. Surely the reason is the defective construction and age of the building, it is the natural result of time. If the parapet had been thicker it would not have needed rebuilding. To stand properly, all parapet walls in long lengths should be at least 14 in. thick, but they rarely are. I contend that when a structure or any part of it needs renewing, the cost should fall on the owner, if the tenant has not caused the damage or allowed it to take place.

I know it is argued that a tenant not only agrees "to repair," but he also covenants to "support, uphold, and maintain," and this rebuilding is necessary to fulfil those covenants, which it is contended, must mean something. My plea is that unless the defect can be shown to be the result of the tenant's neglect, that he should not be asked to rebuild any portions of the property badly, or not sufficiently strongly constructed to last his term. With regard to this I will ask you to kindly note the wording of the judgment in the case of "Lister & Lane," which I shall presently quote.

The same principle applies to bulged walls; they are rarely the result of neglect, nearly always of age or bad construction and the wearing of the building. It may be that the tenant has overloaded the floors or done something to cause the bulge, and if so he should be liable, but if liable he should not be simply asked to tie in the walls with iron rods, he ought to make good his damage by cutting out and properly rebuilding.

I referred just now to a new house where the walls become out of plumb, and contend that there should be no difference between a comparatively new and badly-built house, and an old and better built house. The end must come some day; a time will arrive when each must cease to exist; and as all men do not live to the same age, so all buildings do not last for the same period, and a house badly built and ten years old may be nearer to its end than one well-built and 100 years old, so I think we must not consider age as the same number of years in every case.

But although what I have said may be simply argument and the opinion of a surveyor, we get a step farther when we go to the law reports. There is one great case on the subject, and that is "Lister and another *v.* Lane and another" (T.L.R., C: A., vol. ix., p. 503).

The following extracts are taken from the *Times* law reports.

"Where there is a general covenant to repair, the age and general condition of the house at the commencement of the tenancy are to be taken into consideration in determining whether the covenant has been broken."

The Master of the Rolls said: "If a person took a house which was such a house and of such a kind that by its own inherent quality it would in course of time fall into a particular state, that would not amount to a breach of covenant to repair the house, however large the covenant might be," &c.

In this case the covenant was to "sufficiently and substantially repair and keep in repair, uphold, sustain, and maintain." Certainly a strong undertaking. The case was doubtless a very bad one, the building was condemned as a dangerous structure, but I think we surveyors should consider it in less important cases. Please also note that such covenants must be construed according to the intention of the parties at the time it was entered into, also that the tenant was asked to underpin the property, and "such work did not come within the covenant to repair."

I have recently had a case of a house—part of one of the old Inns of Court, a building almost historically old, and so decrepit that it was beyond alteration, and was pulled down at the end of my client's term; the walls were bulged and tied in several places, but the surveyor of the freeholder asked me to take down and rebuild all bulged portions, some of the ties were in, I am certain, for very many years before the lease was granted, the wall was fairly well pointed and no improper thrust was exercised, for the rooms had been empty for years. I think the demand was most improper. I tried to get the matter referred to any surveyor appointed by the Royal Institute of British Architects, but my suggestion was refused.

In Gutteridge *v.* Munyard (1 Moo: & R. 334) C. J. Tindal stated: "Wherever an old building is demised and the lessee enters into a covenant to repair, it is not meant that the old building is to be restored in a renewed form at the end of the term, or of greater value than it was at the commencement. What the natural operation of time flowing on effects, and all that the elements bring about in diminishing the value, constitutes a loss, which, so far as it results from time and nature, falls upon the landlord; but the tenant is to take care that the tenement does not suffer more than the operation of time and nature would effect; he is bound by reasonable application of labour to keep the house as nearly as possible in the same condition as when it was demised. If it appear that he has made that application, and laid out money from time to time upon the premises, it would not perhaps be fair to judge him very vigorously by the report of a surveyor who is sent upon the premises for the very purpose of finding fault."

This case was previous to Lister *v.* Lane, and Woodfall's paragraph on this subject is as follows:—

"Where a lessee covenants to keep *old* premises in repair, he is not liable for such dilapidations as result from the natural operations of time and the elements, and with a view to determine the relative sufficiency of repair the jury may consider whether the house was new or old at the time of the demise, and what was its *then* state of repair and condition *generally*, not in detail. These principles are carried to their full extent by the Court of Appeal in Lister *v.* Lane. There the covenant was to 'repair, uphold, sustain, and maintain' a house in Lambeth more than 100 years old built on a timber platform resting on a boggy soil, with the result that a wall bulged and the foundation sank so that rebuilding became necessary. It was held that the tenant was not liable, inasmuch as the dilapidations were due to the inherent defect of the house."

I also note that in Woodfall's reference to Proudfoot *v.* Hart he states: "In every case the age of the premises, and also their class and general condition, must be taken into consideration in order to measure the extent of repairs to be done."

Please also note that in Proudfoot *v.* Hart not only is the age of the property insisted on, but also the character, which does not mean locality, because locality is also mentioned, and both are defined. I think character means something apart from the distinction between a cottage and a palace, and we are not stretching a point if we say this also refers to the difference between a jerry built house and a well built house. This, I think, is also clearly indicated by the case of Gutteridge *v.* Munyard.

There is the idea with many surveyors that if a man takes a badly built house on a lease with strong repairing covenants he is a fool and must pay for his folly. The man is a fool, but I do not think he should suffer for what he has done in ignorance, and I think the cases I have given also indicate that principle. The severity of a schedule should vary according to the class of property surveyed.

I spoke just now of our accepting other surveyors' rules and adapting them without thought; but another and, perhaps, worse fault is that we read the results of cases and never read the decisions—we are content with a few lines or extracts in a text book.

There has been a tendency among surveyors to smile at some of the decisions in the courts because some trifling slip is made by the judges with reference to practical details. I wonder if the leading surveyors know as much about law as the leading lawyers know about surveying, and doubt it very much.

If we want to grasp the meaning of a case we must read the whole judgments, and, when carried to the Court of Appeal, we must follow the reasoning from court to court, and if there be any here who have not done so I hope you will, if only in a few instances—it will not take long—look up "Crawford *v.* Newton," "Proudfoot *v.* Hart," and "Lister *v.* Lane." All went to the Court of Appeal.

Proudfoot *v.* Hart is most important, and deals with the likely requirements of a reasonably minded person, but touches on many things. It refers to Belcher *v.* Mackintosh and tells us tenantable repair, good repair, and habitable repair all have a similar meaning.

It refers to Payne *v.* Haine and tells us not to expect repairs to be equally well done in all localities, and touches on the age and class of properties and to the "purpose for which they are used," it also refers to Muntz *v.* Goring, stating the tenant must fulfil the covenant according to the nature of the premises, &c.

When surveyors complain that the legal decisions are difficult to apply, and grumble at them as vague and inexact, I think they want a little too much. The more general the wording is the better, and that is where the skill of the surveyor (which is a very different thing to the knowledge of a builder's estimating clerk) comes in. We must have the knowledge to estimate, but we must also have a certain amount of law knowledge and power to decide how to properly apply it. For it is hard, very hard, to conscientiously say what should be done under certain covenants, we find that out when acting as arbitrators. When we act for the lessor, the rule is, when in doubt "claim it," and if acting for a lessee, the reverse. But only if there is any doubt.

I say "when in doubt," for there should not be many points we cannot decide, and to me nothing stamps a surveyor and shows his ignorance so much as badly-prepared schedules of dilapidations. We find them worded in exactly the same way as specifications for repairs, which is wrong; and the surveyor claims quite irrespective of the covenants, which you doubt if he has ever seen, anything that occurs to him as he goes over the house is jotted down, his only anxiety seems to be the risk of omitting anything that the lessor might like to have done to improve his property.

In conclusion, a few words about surveyors and arbitrators. If difficulties occur where acting for lessee or lessor, I have shown just now what to do, but those difficulties must be met and decided when we act as arbitrators. As a rule I find that when surveyors refer to me there is usually some great difference in the interpretation of the lease. It is not a question of prices, but of principle, *e.g.*, one surveyor will claim for entire painting, the other surveyor will say none is necessary under the covenants, and so on. I had a case recently where one surveyor's estimate was six or seven times as much as the other. Each estimate was correct according to the view taken of the meaning of the covenants. In cases like these do not be weak, do not go on that jury system of splitting the difference, if you can help it, and please do not make each party pay his own costs unless in special cases. This question of "costs" is doing us harm. More than one solicitor has said to me, "I will not refer anything to a surveyor, he is sure to go wrong over the costs." Another solicitor said a short time ago, "I will never refer a dispute to a surveyor unless he is bound to make the costs follow the event." Only a few months ago I was in a case of a disputed builder's account. I suggested at once to refer it to a surveyor. My client's solicitor told me he did not like the idea, he had no faith in references to surveyors; and the solicitor for the other side flatly refused. The result was it was referred to a barrister. I imagine from his remarks he had no knowledge whatever of technical details.

Dilapidation surveys are not absolutely necessary, and if the lessor employs a surveyor to make a schedule he should be prepared to pay his fee. This employment of a surveyor is different to party-wall cases: then the adjoining owner *must* appoint a surveyor if there is a difference. It is compulsory by Act of Parliament, and it is only just that his neighbour, who makes this employment a necessity, should pay for it; but in dilapidation matters there is no such necessity.

Consequently I was surprised recently to be asked for my client, the lessee, to pay the fees of the lessor's surveyor "as usual." "As usual" I believe the practice is not to do so. I know, of course, that under certain conditions named in "the Conveyancing and Law of Property Act, 1892," the lessee has to pay, but the instance I had was the usual one at the termination of a lease.

I am ashamed to say that some surveyors do not act fairly for the lessor when you want to settle on behalf of the lessee before the end of the term. You see them about six months

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or more before that time with a view to a settlement, and failing that you leave plenty of time to do the work. You are met in a courteous manner; no schedule has been served, but you are assured that a survey will be made as soon as possible. Nothing is done, and time goes on, the object being to keep delaying the matter so as to make a money payment compulsory; depriving the tenant of his option to do the work, and also with a view to claim rent for the time the work would take to carry out. You may have met such a surveyor, and you may be a sharp man, but he is a sharper, and you must be on your guard.

I sincerely trust I have been able to mention a few matters you may think worthy of discussion, and I look forward to hearing your views.

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the Architectural Association was held on Friday evening last week, in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W. In the unavoidable absence of the President, Mr. W. H. Seth-Smith, Mr. R. S. Balfour, hon. secretary, was voted to the chair.

The minutes were read and confirmed, and Mr. E. Cooper was elected a member of the Association.

The Chairman announced that a meeting of the Discussion Section would be held on Friday, the 20th inst., when Mr. H. Howard Humphreys would read a paper on "The Manufacture, Testing and Uses of Portland Cement."

New Premises Fund.

The Chairman also announced that the following additional donations had been made to the New Premises Fund, viz.: Mr. A. W. Soames, M.P., 25*l.*; the Hon. A. McGarel Hogg, 5*l.*; and Messrs. John Slater, 26*l.* 5s.; E. T. Hall, 20*l.*; B. T. Batsford, 10*l.* 10s.; W. A. Pite, 10*l.* 10s.; the executors of the late T. Satchell, 10*l.* 10s.; H. A. Satchell, 10*l.* 10s.; Captain W. B. Marling, 10*l.*; G. C. Ashlin, 5*l.* 5s.; H. B. Creswell, 5*l.* 5s.; W. Woodward, 5*l.* 5s.; R. H. Weymouth, 3*l.* 3s.; H. Cayley, 2*l.* 10s.; H. Lovegrove, 2*l.* 2s.; Cole A. Adams, 1*l.* 1s.; E. A. Agutter, 1*l.* 1s.; and S. J. Tatchell, 1*l.* 1s. The total amount received or promised exceeds 3,000*l.*

Travelling Students' Notes.

The Chairman then called on Mr. J. D. Tate to read, in the absence of the author, the Travelling Students' Notes for 1901, by Mr. J. E. Forbes. It was stated that Mr. Forbes, who devoted his tour to a study of Oxford buildings, had been unavoidably detained in Birmingham.

The writer of the paper, in an introductory paragraph, said he was aware that he was out of order in treating the subject in an historical rather than an architectural manner, but his reason for doing so was that, in his opinion, in order thoroughly to appreciate the architecture of Oxford one must first acquire the atmosphere of the place—its legends, origin, and early history. Of architectural Oxford so much was familiar to all, and so much had been written and said, that it would be quite unnecessary for him to repeat facts that were so well known to all interested in architecture.

The paper opened with an account of the legend of St. Frideswyde, and the opinion was expressed that round the priory which was raised in her honour sprang up, in all likelihood, both the town and the schools, developed by gradual successes to a general resort for students. The author then referred to the "chest," the earliest form of corporate property possessed by the University for the relief of poor scholars. They continued to exist and multiply until the end of the fifteenth century, when they had reached the number of twenty-four. Each chest was in charge of two guardians, and was 8 ft. to 10 ft. long and half as wide, and all the chests contained volumes and valuables deposited as pledges by those who had borrowed from them. Reference having been made to the libraries, the author dealt with mediæval college life; the Presbyterians and Independents, who began to appear in the seventeenth century; college life in the eighteenth century (including an account of the coffee houses of the period); a reference to some of those who were to become notable men of England; a description of Shelley's rooms; some remarks on "sporting the oak," and a few remarks as to the differences in college life in old and new Oxford.

Mr. E. W. M. Wonnacott then showed more than fifty very fine lantern slides of Oxford buildings and views.

Mr. N. F. Barwell proposed, and Mr. H. J. Leverton seconded, a vote of thanks to Mr. Forbes for his paper, and to Mr. Tate for reading it.

The Chairman said that Mr. Forbes was the A.A. Travelling Student for 1901, and he was aware that the Committee were not in sympathy with the line he had taken in regard to the preparation of his paper. Mr. Forbes was invited by the Committee to read a paper giving an account of his tour, and he told the Committee that he expected in doing so to provoke some criticism by the comparatively unorthodox character of his paper. In occupying the chair that evening, and in asking them to accord Mr. Forbes a vote of thanks, he did not wish to do more than express his personal feeling of regret that Mr. Forbes had not taken them more into his confidence in regard to his impressions while on tour and as to the character of his studies. Mr. Forbes said that so much was known about the architecture of Oxford that it was quite unnecessary for him to repeat facts already well known. He (the Chairman) entirely disagreed with that view. Mr. Forbes confessed in that either that he was unobservant, and that he had not received any impression from his tour (a conclusion which they could not accept), or that he was so modest that he felt he was unworthy to record anything about the work he did while away. He thought they would agree that Mr. Forbes had mistaken his audience in the matter, and that they would have been more interested in his personal records and achievements during the last summer than in what he had written. What one student could tell another was of considerable interest, and the exchange of ideas between students could never be tiresome to any one. He had listened to the paper with much interest, but not from a practical point of view.

The vote of thanks was then agreed to, and the meeting terminated.

The next meeting will be held on January 3, when Mr. J. A. Gotch will read a paper on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century," with lantern views.

POST OFFICE LONDON DIRECTORY.

THE Post Office London Directory for the ensuing year—the 103rd annual issue of the work—has just been published. No new features have been introduced in the Directory, and, as we have previously remarked, it is not obvious to us that anything could be done to improve it. It has been corrected down to the latest possible date in the careful manner that has characterised previous issues. It now contains 3,356 pp., which is an increase of thirty-five pages over the edition of 1901. The publishers are Kelly's Directories, Ltd., 182-184, High Holborn.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend St. Pancras Borough Council 5,510*l.* for sewers and paving works, and 6,310*l.* for electric light installation; Westminster City Council 32,000*l.* for purchase of land; Woolwich Borough Council 700*l.* for site for a library; Guardians of Greenwich Union 5,600*l.* for purchase of property; Kensington and Chelsea School District Managers 550*l.* for enlargement of lodge; and West London School District Managers 2,500*l.* for provision of a boiler, &c., at schools.

Bricklayers' Work.—Lord Welby, Chairman of the Finance Committee, in reply to a question, said the Works Sub-Committee had collected a good deal of information as to the amount of work done by the bricklayers in the Council's employ, but it had been impossible to go through it and report before the recess.

Strike at Horton Asylum.—Lord Welby also stated that he had received a letter from the Council of the Operative Bricklayers' Society, stating that, if the Council would open the works at Horton at once to the workmen, the strike would be ended.

The Works Department.—The Finance Committee submitted a statement showing the estimated and actual cost of works completed by the Works Department during the half-year ended September 30. The whole of the works completed during the half year were included in the statement, but the Committee stated that the total gave no indication of the turnover of the Department during that period, because some of the expenditure on the works occurred previous to the half-year in question, while, on the other hand, a large part of the expenditure during the six months was upon works still unfinished. The approximate expenditure on estimated works for the half-year was 147,000*l.* The statement dealt with twenty-one works, the final estimate of which was 103,620*l.* 16s. 2d. The actual cost was 118,162*l.* 5s., showing a balance of cost above final estimate of 14,541*l.* 8s. 10d. In thirteen works there was a saving on the final estimate amounting in all to 2,434*l.* 17s. 2d. In the other eight works there was a loss on the final estimate, the greatest being in the case of the North Woolwich drainage works, for which the final estimate was 47,683*l.* 17s. 6d., and the actual cost 64,398*l.* 1s. 2d. A further statement was presented showing the results of all works executed by the Works Department since its creation in November, 1892. With regard to estimated works, the grand total of the final estimate was 1,260,092*l.* 13s. 4d., and the actual cost 1,338,937*l.* 9s. 10d., showing the balance of cost above estimate to be 78,844*l.* 16s. 6d. With respect to jobbing works since April 1, 1895, works of the schedule value of 192,025*l.* 13s. 2d. have been executed at an actual cost of 180,876*l.* 12s. 7d., leaving a balance of cost below schedule value of 11,149*l.* 0s. 7d.

Lord Welby asked that the Report should be postponed till after the recess, and this was agreed to.

At a later stage of the sitting, a report of the Housing of the Working Classes Committee on a proposed lodging-house at Deptford was considered. The Committee recommended "that the working drawings, specification, bills of quantities, and estimate of 51,500*l.* submitted by the Finance Committee in respect of the lodging-house to be erected on the Mill-lane area, Deptford, be approved; that the work of erecting the house be carried out by the Council without the intervention of a contractor; and that the working drawings, specification, bills of quantities and architect's estimate of 47,750*l.* be referred to the manager of works for that purpose."

To this Sir John Dickson-Poynder moved to omit all words after "approved," and the following substituted: That the work of erecting the house be done under contract, and that tenders be invited for the execution of the work.

The Committee, in their report, stated that:—

"In pursuance of instructions the architect prepared a plan of a men's lodging-house on the lines of those already erected by Lord Rowton. The area is triangular in shape, and the plan showed that a building of this kind could be erected on the deeper portion of the area, and that the building would provide accommodation for 670 persons. The shallower portion of the area would still be left, and upon this we were advised that cottage dwellings could be built. Without committing the Council to the erection of such a house on the Mill-lane area we obtained the approval of the Local Government Board to this plan, but before bringing the question of the kind of dwellings to be erected again before the Council, we thought it well to ascertain how far a lodging-house of the character mentioned would be likely to be beneficial and successful if erected on the site. We accordingly communicated through our then chairman (Sir John Dickson-Poynder) with Lord Rowton and Sir Richard Farrant, and they generously intimated their willingness to place their unique knowledge and experience at our service. After having discussed with them very fully the question of the erection of such a house, we were convinced that the site was an exceedingly suitable one for the erection of a men's lodging-house similar in character to those known as the Rowton houses. Both Lord Rowton and Sir Richard Farrant emphatically stated that the most economical number to provide for was 800 lodgers, and that in order to make the house a success it was essential that it should contain all the comforts and improvements which are the characteristics of a Rowton house, whilst the architect informed us that these could only be provided by making a charge of 6d. per bed per night.

As this is the first lodging-house on these lines that the Council has attempted, no doubt a somewhat detailed description of the plans of the house will be useful. Accommodation is provided for 804 lodgers, as

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compared with 800 and 805 in the Newington Butts and Hammersmith Rowton houses respectively. The entrance and principal rooms on the ground floor are arranged as follows:—The entrance is central, and gives access to the dining-room on the right and to the smoking and reading rooms on the left. The office commands the entrance for lodgers and for the staff, and is arranged close to the superintendent's quarters. The dining-room is planned with a long hot-plate chamber in the centre, with lodgers' sculleries. It is well lighted from side and roof. The hot-plate chamber is ventilated by two fans driven by electricity, and this arrangement helps the ventilation of the dining-room. Immediately adjoining the dining-room is the lodgers' crockery-room. The shop for sale of hot and cold viands is placed in a convenient position with a direct servery thereto, and with easy communication to the kitchen in the rear. The smoking-room is arranged on the Mill-lane frontage. It is well lighted and has good cross ventilation. The reading-room is approached from two of the main corridors. It is of a suitable shape and it is well lighted by side and top lights. This room also will have cross ventilation. . . . With regard to the sleeping accommodation, two principal staircases leading to the dormitories, and one emergency staircase, are provided. It will therefore be practically impossible for all egress from the house to be blocked in the event of fire. Each cubicle is 4 ft. 10½ in. wide and 7 ft. 4½ in. long (internal dimensions), and is provided with a window, so that ample means of through ventilation are secured. Two cubicles on each floor will be occupied by the resident male staff. The dormitory corridors are 4 ft. 6 in. wide, and four water-closets and two sinks for night use are provided on each of the five dormitory floors. The lodgers' promenade is provided over the reading room and part of the dining-room, and is approached by means of the south-west staircase. Throughout the preparation of the plans we have had the advantage of the advice and assistance of Lord Rowton, whose courtesy and kindness in the matter we wish to heartily acknowledge. The architect's estimate of the cost of the building as above described is as follows:—Cost of building (including clearance of site, trial holes, superstructure and foundations, special works, electric lighting, provisional amounts, &c.), 49,287*l.* 15s.; architect's expenses, quantity surveyors' and other fees, supervision, provision for articles to be bought direct and incidentals, 2,212*l.* 5s.; making a total of 51,500*l.* We have referred the drawings, specification, quantities and architect's estimate of the cost of building (47,750*l.*) to the manager of works for examination and report, and he has informed us that he is prepared to undertake the work of erecting the house at this amount. In these circumstances we propose that the work should be done by the manager of works."

Sir J. Dickson-Poynder, M.P., said he was greatly disappointed that it was proposed to hand this work over to the department. There was no doubt the Council were running some risk in the erection of such a building, and he felt that in giving it over to the Works Department they were dooming it to failure, or at least running a very great risk of it being a failure. No fair-minded man in the Council could say that the Works Department had been a success, or that it warranted them in allowing such a work to be carried out by direct labour. He asked them to throw off insincerity and affectation, and admit this fact. There was no doubt that the reason of the non-success of the direct labour policy was that trades union restrictions, always excessive, became absolutely extreme in connexion with a body like the London County Council. Trades unions could be kept in check by contractors; but the Council pandered to them, and, consequently, it was impossible that the Department should be a success. Lord Rosebery told them the County Council was just emerging from unpopularity; but he (the speaker) felt that if they continued the policy of direct labour they would again decline into extreme unpopularity.

Mr. A. T. Williams seconded the amendment as a business man with a practical training. He declared that the methods of those responsible for the Works Department were enough to make a business man's flesh creep.

Mr. Campbell supported the amendment, and remarked that, considering the amount written off the land, it was absurd to talk of the house being built on a self-supporting basis.

Dr. Collins said the mover and seconder of the amendment had indulged in a diatribe against the direct employment of labour, but that was not the question before them that day. Coming to the question as to whether this building should be erected by the Works Department, he saw nothing unreasonable in the recommendation of the Committee. In view of the figures of the present management of the Works Department, he saw no reason why that Department should not carry out the work. He was not an out-and-out opponent of contractors, but he believed it best to have both contractors and direct employment, so that they could have an opportunity of stepping in if there was reason to suspect collusion amongst the contractors.

Colonel Rotton asked the Chairman of the Committee whether he believed the lodgings could be let at 6d. a night if the work was carried out by the Works Department, and, secondly, whether it could be carried out as expeditiously by the Department as by a contractor.

Mr. Howell J. Williams said that Sir J. Dickson-Poyndor had been unfortunate in his selection of a case. The Rowton House Company did not employ contractors, but had adopted a system of direct employment of labour; why, then, should not the Council do the same? Two years ago the department was kept without work, and, now that enormous capital had been sunk in it, it was absurd to think of putting a check upon it now that it was in full swing. This was a work in which there was much repetition work, and it was one which the Department would be well able to carry out. Still, the Department was not on a satisfactory basis. The Council imagined that it employed its own labour, but it did so only in a sense. They found the capital, but the work was hindered by hostile influences. What private owner who wanted to build a mansion would allow one or two clerks of works to hinder the successful carrying out of the work? The cause of the want of success of the Works Department was the hostility of clerks of works to the Council doing its own work.

Mr. H. P. Harris said he would admit that the Council had a mandate to have a Works Department, but he took it also that the Council had a mandate to have an efficient and economical Department. In the case of work for the Main Drainage Committee, if a loss was made it only fell on the unfortunate ratepayer, but the consequences were more serious to the Housing Committee, which had to make its accounts balance. It was time a protest was made, for they had these facts before them. Of the works carried out by contractors for the Housing Committee they had been done for 15,000*l.* below the architect's final estimate. On the other hand, the Works Department, in the work they had carried out for the Committee, had exceeded the measured value by 25,000*l.* If he thought the Works Department would be inquired into he was prepared to call a truce, but unless that was done they must go on protesting.

Mr. Fletcher expressed the opinion that the only way in which this lodging-house could be made a success was by allowing it to be built by contractors.

Mr. Burns, M.P., denied the truth of the charge that workmen limited their output when employed by Municipal Authorities. Direct employment of labour under the Council had given the ratepayers better work, and the men better wages and safer conditions of labour. The Works Department was founded on the delinquencies of the contractors and not at the demand of the trades unions. With fair criticism and honest clerks of works, the results of the operations of the Department would be better in the future than they had been in the past. The Department had been crippled by enemies within and without. If the men scamped their work the remedy was to dismiss them.

Mr. W. Peel, M.P., said he was glad to see that a change had come over the opinions of the labour bench as to the Works Department, and as to the evils and sins of contractors. Apparently, Mr. Burns was now persuaded that the Department was not as efficient as it might be. For the last three or four years the Progressives had said the Works Department must be reorganised, but they had not made the slightest attempt to improve it. Yet when complaints were made they met criticism with the same old answer, that they would reorganise the Department, which they desired to go on although losses were made. It almost seemed as if the policy of the Progressives was to house the Works Department instead of the working-classes.

Mr. White said there was a great deal of truth in the published assertions as to restriction of the labour output. The Main Drainage Committee, in asking for a large excess vote, said:—"It would appear that the excess is principally due to the large expenditure on labour, and we understand that all the men engaged on the work, with one exception, were discharged for not doing their duty to the Council."

Mr. Waterlow, Chairman of the Housing Committee, pointed out that there was at present far more work in the hands of the contractors than there was in the hands of the Department. As to the proposal now under discussion, if the recommendation were agreed to the Department would be able to start work at least two months before a contractor if the work were put out to contract, and he saw no reason why the Department should not do the work expeditiously and so as to make it pay. He should vote for the Committee's recommendation on the distinct understanding that the Department was to be improved, and that very shortly.

Mr. Crooks said he and his party had sympathy with labour, but not with loafing.

The Council divided, and the amendment was defeated by 84 votes to 28. A further amendment, requiring a fuller report from the committee on the financial bearings of the scheme, was negatived by a show of hands. The committee's recommendation was then adopted.

Houses of Historical Interest.—The report of the Historical Records and Buildings Committee relating to the indication of houses of historical interest in London, which we printed in our last issue, was discussed.

Mr. Beachcroft moved the following amendment:—"That the recommendation be referred back to the Committee for further consideration, the Council being of the opinion that the undertaking of work of this kind should be avoided as far as possible, as tending to discourage the efforts of societies and associations now working voluntarily in the public interest." He thought, unless they had a Committee of Taste, it would be very difficult to carry the Committee's proposal out.

Mr. H. Lawson seconded the amendment on the ground that there was no reason why the Council should go about and seek fresh obligations.

After some further discussion the Council divided, and the amendment was defeated by 54 votes to 46. The recommendation was then agreed to.

The Government and the Fire Brigade.—The Council adopted a recommendation by the Finance Committee to protest against the proposed action of the Treasury in regard to stopping the annual subvention of 10,000*l.* in aid of the Metropolitan Fire Brigade, and to point out that the inspection of fire appliances in many Government buildings was gratuitously performed by officers of the board.

South Metropolitan Gas Burners. Mr. Organ asked the Chairman of the Public Control Committee to state what steps the South Metropolitan Gas Co. had taken to supply and fix, free of charge, burners suitable in all respects for the consumption of gas of the illuminating power prescribed in their Act of last year.

Mr. W. C. Johnson replied that the company obtained power to reduce the illuminating power of their gas from sixteen candles to fourteen candles, on condition that they supplied and fixed, free to consumers, burners suitable for burning the gas of lower power. The company had given notice to consumers that they would supply such burners to any consumer who asked them to do so, but many consumers had not applied. It was important that the public should know that the old burners were not suitable for the gas now supplied by the company, and that consumers would save money and obtain better light by obtaining the new burners from the company. Some of the burners which had been issued by the company were governor burners, and were very satisfactory, but the company also issued other burners which were not so suitable or satisfactory when the gas is burnt at a high pressure, and consumers should, therefore, ask for governor burners in every case.

The Control of the Erection of Wooden Structures.—Mr. Goddard Clarke, Chairman of the Building Act Committee, stated, in reply to questions, that the decision of the Divisional Court in the test case brought by the Westminster City Council against the London County Council placed the obligation for the safety of wooden structures upon the Borough Councils, but that the County Council still controlled the erection of iron structures.

Technical Institutes.—The Technical Education Board reported as follows:—

"The Governors of the Hackney Institute have

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accepted a tender for the erection of the first block of buildings in connexion with the technical institute for Central Hackney at Hackney Downs, on a site, part of which was transferred to the Governors by the Charity Commissioners, and part taken over from the North-East London Institute. The designs, which were prepared by Mr. Arthur W. Cooksey, were selected from a limited competition by Mr. Thomas Blashill, late Superintending Architect of the Council, who acted as assessor. The first block of buildings will provide a physical laboratory with electrical testing-room, mechanical laboratory, chemical laboratory, balance-room, preparation-room, lecture theatre, drawing-office, and six classrooms, in addition to a boiler-room and other facilities. The block forms about one-quarter of a complete scheme of buildings for which plans have been prepared and which will completely cover the site. . . . .

The contract drawings for the Poplar Technical Institute are complete, and are about to be submitted to the Quantity Surveyor. It is estimated that about five weeks will be required for taking out the quantities, so that we expect that the estimate for submission to the Works Department will be available at the end of January.

The contract drawings for the new Brixton Technical Institute have been completed, the specification is now being prepared, and the drawings and specification will be sent to the Quantity Surveyor before the end of the present month. It may be anticipated that the estimate for submission to the Works Department will be available about the third week in January."

The Criterion Theatre.—The Theatres and Music Halls Committee reported that they had for some time past given careful consideration to the question of the structural condition of the Criterion Theatre, Piccadilly, and its suitability as a place of entertainment from the point of view of the public safety. The building was originally intended for use as a small concert-hall, and only after the entire carcase was erected was it decided to convert the premises into a theatre :—

"In 1899, in accordance with our practice of making a thorough survey of the older places of public entertainment, a complete inspection of the theatre was made by the Council's officers, and as the result we considered certain suggestions for improving the premises. The architect and chief officer of the Fire Brigade, however, when these proposed alterations were before us, reported that the site of the theatre was such as to render it quite unsuitable for use as a place of public entertainment, and in the circumstances we saw no alternative but to acquaint the Lord Chamberlain with this opinion. . . . We did not see our way when asked by the Lord Chamberlain for an opinion on the theatre to ignore the important question of the site, and we, therefore, informed his lordship on February 21, 1901, that, subject to the disability inherent in the site, the lessee appeared to be ready to make almost every possible arrangement to promote the safety of the public. In reply the Lord Chamberlain stated that he would be glad to understand whether the Council withdrew its letter of October 18, 1900, which would have practically made it necessary for him not to renew the licence in future for the theatre. After again considering the whole of the circumstances of the case we informed his lordship that we regretted our inability to withdraw the letter referred to, but that we had communicated to Mr. Wyndham the fact that we should be prepared to consider any plans or scheme which, in his opinion, would make the building safe in the event of a fire. We were subsequently informed on October 1, 1901, that the Lord Chamberlain had granted a full licence for the theatre 'upon Mr. Wyndham giving an undertaking to comply with the Council's suggestions in a manner to be agreed upon on further discussion with the Council forthwith, and a fire-resisting curtain to be fitted to the proscenium opening without delay.' Since that date proposals have been submitted by Mr. Verity on behalf of Mr. Wyndham for improving the theatre, and both these gentlemen appeared before us at our meeting on the 4th inst., and undertook to carry out all the alterations which were suggested in October, 1900, as the result of the examination of the theatre made by the Council's officers. For this purpose property will be purchased on the Jermyn-street side of the theatre which will enable exits to be provided sufficient to give ample and direct egress to the street. It was pointed out to us that it was very important the Lord Chamberlain and Mr. Wyndham should know our opinion of the theatre when these alterations have been carried out. . . . We recommend that the course taken in regard to the Criterion Theatre be approved, and that the Lord Chamberlain be informed, taking into consideration the small holding capacity of the theatre, the Council is of opinion that, when the proposed alterations and additions are completed, the theatre will be reasonably safe for the public."

The recommendation was agreed to.

Theatres, &c.—The following applications were agreed to on conditions: Boating Exhibition, London Exhibitions Buildings (Mr. A. O. Collard); arrangements for the New Gaiety Theatre, which it is intended to erect at the junction of the Strand with the west spur of the proposed new road from Holborn (Messrs. E. Runtz & Co.); alterations to the basement exit at the south-east angle of the St. Peter's Institute, Buckingham Palace-road (Messrs. Chambers & Son).

Fire Stations.—The following recommendations of the Fire Brigade Committee were agreed to :—

"That the estimate of 3,600*l.* submitted by the Finance Committee be approved; that an expenditure of 3,350*l.* be authorised for enlarging the Stoke Newington station; that the work be executed by the Council without the intervention of a contractor; and that the drawings, quantities, specification, and estimate be referred to the manager of works for that purpose.

That the estimate of 819*l.* submitted by the Finance Committee be approved; that an expenditure of 705*l.* be authorised for the provision of a ladder shed and additional stabling at the Fulham station; that the work be executed by the Council without the intervention of a contractor; and that the drawings, quantities, specification, and estimate be referred to the manager of works for that purpose."

Objects of Archæological Interest.—The Historical Records and Buildings Committee reported as follows :—

"Our attention having been called to the fact that objects of archæological interest frequently come to light in the course of dredging operations in the Thames, it appeared to us most desirable that such objects should be preserved to London; and we accordingly communicated with the Thames Conservancy, asking them to afford facilities to the Council for obtaining such articles with a view to their preservation. We have now to report that we have received a letter in reply from them, stating that any such objects which are discovered are preserved at the offices of the Thames Conservancy, where they may be inspected. Considering the great number of objects recovered from the Thames which have found their way into private ownership, we feel sure that the Council will be glad to know of the action of the Thames Conservancy, and we accordingly report the fact for its information."

Housing: Reid's Brewery Estate.—The Housing of the Working Classes Committee reported as follows, the recommendations being agreed to :—

"On December 10, 1901, the Council referred to us tenders for the superstructure of block C, Reid's Brewery estate. These tenders have been based on the understanding that the superstructure of blocks A and B shall also be carried out by the successful tenderer at the same schedule of prices as that for block C. The tenders received were as follows—

	Amount of Tender for Block C.
Messrs. Hobbs Bros.	£9,042
Mr. R. M. Hughes (Birmingham)...	10,012
Mr. H. L. Holloway	10,026
Messrs. Holloway Bros.....	10,090
Messrs. Martin, Wells, & Co.....	10,093
Messrs. McCormick & Sons	10,247
Mr. B. E. Nightingale.....	10,646
Messrs. Stimpson & Co.....	10,733
Messrs. E. Lawrance & Sons	10,866
Messrs. Spencer, Santo, & Co.	11,078
Mr. Samuel Redhouse.....	11,192
Messrs. Treasure & Son.....	11,198
Architect's estimate.....	10,382

The result of the tendering for the three blocks A, B, and C appears satisfactory, since the amounts of several tenders are well below the amount of the Architect's estimate. We are unable to recommend the acceptance of the lowest tender (that of Messrs. Hobbs Bros.) or of the next (that of Mr. R. M. Hughes). We think the Council will be well advised to accept the tender of Mr. H. L. Holloway. With regard to blocks D, E, and F, we have received a report from the manager of works to the effect that he is prepared to undertake the work of erecting the superstructure of block D at the amount of the architect's estimate, and also to build the superstructure of blocks E and F at the same schedule of prices. We are therefore of opinion that the work should be entrusted to the manager of works. We recommend—(*a*) That the tender of Mr. H. L. Holloway, amounting to 10,026*l.*, for the erection of the superstructure of block C, Reid's Brewery estate, and for the erection of the superstructure of blocks A and B, at the same schedule of prices, be accepted.

(*b*) That the work of erecting the superstructure of blocks D, E, and F, Reid's Brewery estate, be carried out by the Council without the intervention of a contractor, and that the working drawings, specification, bills of quantities (submitted to the Council on December 10, 1901), and architect's estimate of 10,382*l.* in respect of the superstructure of block D, be referred to the manager of works for that purpose, on the understanding that the erection of the superstructure of blocks E and F shall be undertaken at the same schedule of prices."

Improvements.—The following recommendations of the Improvements Committee were agreed to :—

"That the estimate of 1,500*l.* submitted by the Finance Committee be approved, and that subject to the Council of the Metropolitan Borough of Islington arranging with the New River Company for the necessary alterations in the position of the culvert under the footway in Essex-road, and subject to the borough council undertaking at its own cost the necessary paving and other works, the offer of the owners of the Tufnell-Canonbury Estate to give up for 1,500*l.* the land required for widening Essex-road between Cross-street and Halton Cross-street be accepted by the County Council.

That the estimate of 344*l.* submitted by the Finance Committee be approved, and that a contribution be made on the usual conditions of one-half of the net cost of widening Herbert-road and rounding the north-eastern corner of Herbert-road at its junction with Plumstead Common-road, proposed to be undertaken by the Council of the Metropolitan Borough of Woolwich, such contribution not to exceed 344*l.*

That, in connexion with the Old-street and Goswell-road improvement, the action of the Improvements Committee be approved in substituting wood paving for granite setts for the widened portion of the carriageway between the kerb and the tram line.

That, in connexion with the Tower Bridge southern approach improvement, the plot of land about 1,780 square feet in area, lying between the new approach road and Grange-road, Bermondsey, be allotted to the Council of the Metropolitan Borough of Bermondsey, with a view to the construction of underground conveniences."

The View from Richmond Hill.—A number of recommendations came up from the Parks Committee respecting the renewal of the option for the purchase of the Marble Hill Estate, as was explained by Lord Monkswell at last week's meeting of the Council.

Lord Monkswell said that with regard to the clause discussed at last week's meeting of the Council regarding boats and landing-stages, the Executive Committee did not feel it was an important one, and therefore it might be considered defunct—for this year, at any rate.

The report was agreed to.

The Council adjourned at eight o'clock for the Christmas recess, and will not meet again until January 21.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The usual monthly meeting of the Sheffield Society of Architects and Surveyors was held at the Society's Rooms, Leopold-street, on the 11th inst., Mr. T. Winder in the chair. Much regret was expressed on the death of Mr. C. J. Innocent, a past President of the Society, and a vote of condolence and sympathy with his widow and family was passed. —Mr. A. Jeffery, artist in stained glass, then delivered a lecture on "Stained Glass." He commenced by giving a slight history of stained glass. The old masters taught us many lessons, and much could be learned from them. We should try and embrace all the good qualities of the old men, ignore their shortcomings, and try to improve on what has been done before us. After the sixteenth century stained glass died out, and did not again revive until the nineteenth century. Mr. Jeffery went on to explain that a window should be part of a building, a mode of letting light into a building, and should not be treated as a picture or wall decoration. If a man attempted a picture he spoiled his material as glass, and made a very bad picture. English glass was superior to foreign, both in material and workmanship. The most important point in a window was permanency, and only the most permanent of colours should be used, at whatever cost. Speaking of domestic glass, he did not think the modern style was a passing fancy, but had come to stop; but, like all other transitions in art, at the outset it seemed to have been let loose, and we seemed to be seeking after something we could not quite grasp. It would ultimately settle down and find its own level. He was eagerly looking forward to the time when there would not be so much commercialism in connexion with artistic crafts. He hoped architects in the near future would come more in contact with the craftsman, and by their joint ideas be enabled to raise the standard of work higher than it is. By so doing he thought there would be a bright prospect for stained glass in the future. The lecture was illustrated by drawings and examples of stained glass. On

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the motion of Mr. C. Hadfield, seconded by Mr. J. Smith, and supported by Messrs. W. J. Hale and H. L. Paterson, a vote of thanks was accorded the lecturer.

NORTHERN ARCHITECTURAL ASSOCIATION.—A meeting of the Northern Architectural Association was held on the 11th inst., at the offices of the Association, 36, Northumberland-street, Newcastle. Mr. J. Miller Carr delivered a lecture on "Terra Cotta: constructional faience and ceramic mural decoration." The lecturer at the outset referred to the ancient history regarding terra cotta, and then to the modern use of the material. In doing so, he remarked that it was a fact that building materials have an increasing value from a decorative point of view exactly in proportion to the richness and variety of their colour. Speaking of colour in connexion with terra cotta, they must say that ten years ago they were in the full tide of uniformity in architects' specifications. A few years later a close approximate uniformity was attained with the same material, and after some eight years the feeling for true art advanced in the country by leaps and bounds. The saddest thought he had to-day about colour in terra cotta buildings was that they did not really know what value and beauty they might have if only they would let Nature have her own way. One of the principles he laid down was that the true methods of use of any material should be such as were suited to its nature and properties. A successful use of faience involved a true understanding of terra cotta as its foundation. They must consider the materials suitable for exteriors of buildings in this country. In his opinion it was a mistake, for many practical reasons, to attempt to carry out glazed treatments for the internal parts of buildings at the same time that the general structure of the exterior was proceeding. The question arose: was it not possible to depart with advantage from some of the traditional forms of treatment for interiors? He next directed their attention to the various examples of ceramic mural decoration on the screen, and pointed out the characteristics of each example.—After the lecture, the ex-President of the Association (Mr. W. Glover) was presented with an illuminated address and a silver ink-stand on his leaving the district for the South after seventeen years' membership.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Strand.—The retention of an iron and glass shelter at the front entrances to the Century Theatre, Strand (Messrs. E. Runtz & Co. for Mr. G. Edwardes).—Consent.

Clapham.—Wood and tile porches at the entrances, and wooden brackets to the overhanging portions of the roofs of the gables, of two semi-detached houses on the east side of Rodenhurst-road, Clapham Park (Mr. H. J. Capell for Mr. A. E. Peacock).—Consent.

Clapham.—Six houses, with one-story shops in front, on the site of Nos. 95, 97, and 99, High-street, Clapham (Mr. W. Theobalds for Mr. H. F. Harrington).—Consent.

Deptford.—Retention of a wood and glass covered way and a greenhouse at the side of No. 30, Lewisham High-road, New Cross, abutting upon Park-road (Mr. E. Crosse for Mr. H. Bisley).—Consent.

Fulham.—Deviation from the plans approved for the erection of a two-story addition on the northern side of No. 4, Filmer-road, Fulham, so far as relates to the construction of a window, with shop facia over, in substitution for two windows at the ground-floor level (Mr. A. R. Bulley for Mrs. J. Davis).—Consent.

Hackney, North.—A three-story building, with a shop on the ground floor, on the site of No. 89, Stoke Newington-road, Stoke Newington (Mr. H. W. Bannan for Mr. W. Pierson).—Consent.

Hackney, North.—A building at the rear of No. 168, Albion-road, Stoke Newington, to abut upon Broughton-road (Mr. C. F. Parsons for Mrs. E. Parsons).—Consent.

Kensington, South.—A brick and stone porch at the entrance to No. 11, St. Alban's-road, Kensington (Mr. C. E. Sayer for Mr. F. Sandars).—Consent.

Lewisham.—A one-story shop on part of the forecourt of No. 144, Rushey-green, Catford (Mr. J. Laird for Mr. F. Hardstone).—Consent.

Lewisham.—Wood and tile pents over the entrances to twelve houses on the south side of Stillness-road, Lewisham, between Crofton Park-road and Brockley-rise (Mr. J. S. R. Richardson).—Consent.

Lewisham.—The retention of a wooden oriel window at the basement-floor level in front of No. 22, Sydenham-park, Lewisham (Mrs. M. Hart).—Consent.

Lewisham.—A one-story shop on part of the forecourt of No. 64, Rushey-green, Catford (Mr. A. W. Osborn for Mr. W. Hatch).—Consent.

Strand.—Two iron and glass shelters at the entrances to an extension of the Trocadero Restaurant, Shaftesbury-avenue, St. James's (Messrs. J. Lyons & Co., Ltd.).—Consent.

Strand.—An iron and glass shelter in front of the London Pavilion Music-hall, Piccadilly-circus (Messrs. Wylson & Long for the London Pavilion, Ltd.).—Consent.

Wandsworth.†—A dwelling-house on the south side of Ormerley-road, Balham, to abut upon Laitwood-road (Mr. W. E. Johnson for Mr. G. E. Treves).—Consent.

Chelsea.—Retention of a wood and glass roof over a portion of the area of No 18, Tedworth-square, Chelsea (Messrs. H. Gibbons & Sons for Mr. M. Wadham).—Refused.

Clapham.—A two-story house on the north side of Poynder's-road, Clapham Park, at the corner of Rodenhurst-road (Messrs. R. Price & Son for Mr. S. H. Poulton).—Refused.

Fulham.—Residential flats, with projecting shop fronts, on the site of Nos. 104, 106, and 108, High-street, Fulham (Mr. C. H. Brodie for the Eagle Investment Co.).—Refused.

Greenwich.—A one-story shop in front, and a one-story workshop at the rear, of No. 43, Old Dover-road, Blackheath, at the corner of Dornberg-road (Mr. A. Roberts for Mr. G. Hall).—Refused.

Hammersmith.—Four houses, with shops, on the west side of Askew-road, Shepherd's Bush, at the corner of Gayford-road (Mr. H. Blackburn for Mr. R. Percy).—Refused.

Hampstead.—Three houses, with bay windows, on the east side of Finchley-road, and six houses, with bay windows, on the north side of Platt's-lane, Hampstead (Mr. G. W. Hart).—Refused.

Wandsworth.†—A one-story shop in front of No. 15, High-street, Putney (Mr. J. C. Radford for Mr. E. W. Taylor).—Refused.

Woolwich.†—Two houses, one on the north side and one on the south side of Tuam-road, Woolwich, to abut upon Ennis-road (Mr. J. O. Cook for Mr. H. W. Grant).—Refused.

Width of Way.

Lewisham.—The retention of the forecourt fence in front of Nos. 1, 2, and 3, Laurel-villas, at less than the prescribed distance from the centre of Laurel-grove, Acacia-road, Sydenham (Mr. T. H. Wood).—Consent.

Finsbury, East.—Warehouse buildings on the north side of Great Arthur-street, and south side of Bayer-street, Golden-lane, with the external walls of such buildings at less than the prescribed distance from the centre of Bayer-street (Messrs. N. S. Joseph, Son, & Smithem for Mr. S. H. Beddington).—Consent.

Greenwich.—No order with respect to the application of Mr. J. Hollick for consent to the erection of a stable building on the south side of Morden Wharf-road, Blackwall-lane, Greenwich.—Agreed.

Brixton.—Stable buildings on the south side of Baker-street, Brixton, at less than the prescribed distance from the centre of the street (Mr. J. J. Freeland for Mr. G. Bentley).—Refused.

Width of Way and Projections.

Bermondsey.†—Deviation from the plans sanctioned for the erection of a building, with bay windows, to be inhabited by persons of the working class, on the east side of the Tower Bridge southern approach, Bermondsey, to abut also upon Long-walk, Abbey-street, and New-road (Messrs. Humphreys-Davies & Co. for the South-Eastern Railway Company).—Agreed.

Marylebone, East.—A church, with projecting porch, buttresses, and plinth, on the west side of Glentworth-street, at the corner of Upper Park-place, St. Marylebone (Messrs. W. Bucknall and J. N. Comper for the Rev. G. F. Forbes).—Consent.

Space at Rear.

Woolwich.—No order with respect to the application of Mr. A. E Parnell, on behalf of Mr. A. Chapman, for consent to an increase in height of the back additions to No. 2, High-street, Plumstead.—Agreed.

Lewisham.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a coach-house at the rear of Nos. 1 and 2, The Parade, Sydenham-road, Sydenham (Mr. G. Tolley for Mr. F. A. Norden).—Refused.

Width of Way, Line of Frontage, and Space at Rear.

Lewisham.—A detached house on the east side of Brockley-rise, Brockley, northward of Stillness-road, with the external walls of such house at less than the prescribed distance from the centre of a public footpath to an advanced line of frontage in Brockley-rise, and with an irregular open space at the rear (Mr. J. W. Webb).—Refused.

Line of Frontage and Construction.

Bow and Bromley.—The retention of a wooden shed addition to a saw-mill and joiner's shop at Tredegar Works on the south-west side of Ordell-road, Bow, and to the retention of an iron and concrete timber-drying stage at such premises in advance of the general line of buildings in Ordell-road (Messrs. Perry & Co.).—Refused.

Formation of Streets.

Norwood.—That an order be issued to Mr. R. Pippette, sanctioning the formation or laying out of a new street for carriage traffic to lead from Auckland-hill, West Norwood, to St. Gothard's-road, and in connexion therewith the widening of Auckland-hill and St. Gothard's-road (for Mr. J. G. Pilcher). That the name St. Bernard's-road be approved for the new street.—Consent.

Wandsworth.†—That an order be issued to Mr. J. M. Jones, sanctioning the formation or laying out of a new street for carriage traffic to lead from Wimbledon Park-road, Southfields, to Replingham-road, and in connexion therewith the widening of a portion of Wimbledon Park-road and Merton-road (for the Lands Development Syndicate). That the name Pirbright-road be approved for the new street.—Consent.

Woolwich.—That an order be issued to Messrs. Farebrother, Ellis, & Co., sanctioning the formation or laying out of a new street for carriage traffic out of Woolwich-road, Woolwich, in continuation of Yately-street (for the Trustees of the Bowater estate). That the name Yately-street (in continuation) be approved for the new street.—Consent.

Lewisham.†—That an order be issued to Mr. J. W. Webb refusing to sanction the formation or laying out of streets for carriage traffic, 40 ft. wide, on part of the Crofton Park estate on the eastern side of Crofton Park-road, Brockley.—Agreed.

Wandsworth.—A deviation from the plan approved by the Metropolitan Board of Works for the formation of new streets out of Streatham-hill, Streatham, to be named Everton-road, Normanhurst-road, Roseheath-road, Daysbrook-road, and Wavertree-road (Mr. F. N. Kemp for Mrs. Wyatt-Coffee); for consent to the formation of the western portion of Normanhurst-road of a less width than 40 ft., and to the erection of houses.—Refused.

Means of Escape from Top of High Buildings.

Kensington, South.—A modification of the means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the eighth and ninth stories of a block of residential flats known as Block No. 1, Iverna-court, and situate on the west side of Wright's-lane and south side of Iverna-gardens, Kensington, for the persons dwelling or employed therein (Mr. R. Clarke for Messrs. J. Howard & Co.).—Refused.

The recommendations marked† are contrary to the views of the Local Authorities.

TRADE CATALOGUES.

THE Kern Burner Company have sent us an illustrated catalogue of their Clamond gas-heating radiators, which form a new description of gas fire, and were noticed in the *Builder* recently. It is claimed that these fires emit a greater total heat and a larger proportion of radiant heat per unit of gas consumed than any other gas fire on the market. The burner is constructed on the some principle as the Kern burner for incandescent lighting, a thorough mixing of the air admitted through the side holes in the Bunsen tube being effected with the gas before the mixture reaches the point of ignition. The effect of employing a more intimate mixture of gas and air is, no doubt, to shorten the flame but to increase its temperature, and as the flame is utilised for heating a number of perforated clay tubes, it is quite conceivable that a larger proportion of radiant heat is obtained than in the older forms of gas fire. It is improbable that the total heat obtained is greater than that yielded by some forms of condensing stoves, but radiant heat is much preferable to convected heat for heating dwelling-rooms, and we have no hesitation in recommending the Clamond radiator to the consideration of our readers.

The Simplex Steel Conduit Co., Ltd., of 20, Bucklersbury, London, have sent us supplementary pamphlets to their current price-list. This company makes a speciality of conduit wiring for the electric light, and these supplementary sheets give particulars of some important additions and improvements to their system. We note that they now supply enamelled screwed steel piping with the longitudinal seam unbrazed, at a price nearly 40 per cent. cheaper than the same material with the seam brazed. It was formerly found impracticable to screw unbrazed conduit, but by a novel die which they have invented this

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can now be done simply and effectively. These conduits would be suitable for wiring for the electric light in breweries, engine-rooms, &c., as they would be able to withstand rough usage and can easily be made watertight.

Mr. Samuel Cabot (Boston, U.S.A.) sends us some specimens of his numerous creosote stains for wooden shingle, used more largely in America than in this country, as a covering to house walls. It is claimed that these stains wear as well as the best paints, and are softer and better in colour, leaving the grain of the wood showing, while they preserve the wood from decay or insects. As far as appearance goes the specimens sent to us bear out the claim made for them. He sends us also a book containing some prettily executed views of houses in chromo-lithograph, illustrating the effect of some of the colours when seen *en masse* as the colour element of a building.

We have also, by the same patentee, Cabot's sheathing and deafening "quilt," a material for the lining of walls and roofs for warmth and for deadening sound. It is a double thickness of a brown paper sewn together in sheets and containing between the two layers of paper a filling of cured eel-grass (*Zosteria marina*), with long flat fibres crossing each other at every angle, and forming a soft cushion of innumerable dead-air spaces. It is not inflammable except as to the paper, and it is stated that the material is repellent to moths and vermin. It seems a material worth attention. The B. & S. Folding Gate Co. are the agents for it in London.

Mr. Robert Adams sends us the new edition of his complete catalogue of building specialities, which includes an immense variety of articles such as fanlight openers and adjusters for various models of sash; gate and door fittings and spring hinges; reversible sashes and various contrivances for safe window-cleaning; casement and window fastenings sliding; rolled steel and bronze casements; iron window frames; gun-metal handles and door furniture of various types, &c.

Messrs. Charles Carr, of Smethwick, send us their supplementary list, containing particulars of their steam valves and steam fittings in copper and brass.

Messrs. Ewart & Son, Ltd., of 346-350, Euston-road, send us their new catalogue of geysers and other water-heating apparatus. Besides their well-known "Lightning" geyser, which is now made in seven sizes, illustrations and descriptions are given of the "Acme," "Califont," "Auto-Lightning," and other geysers. The "Califont" is, perhaps, the most important of the new types. The geyser itself may be fixed in any convenient place in the basement or elsewhere, and a single pipe is led from it with branches to the bath and other fittings at which a supply of hot water is required. The opening of any hot-water tap raises the gas in the "Califont," and a supply of hot water can (it is said) be "instantly obtained at any temperature (up to 200 deg. Fahr.) in any quantity." We presume that the water in the pipe between the geyser and the tap must be drawn off before hot water will issue from the tap. The water is delivered at the same pressure as the main service, (but not exceeding 100 lbs. per sq. in.), and taps can, therefore, be fixed above as well as below the geyser. In this and some other geysers (including the "Lightning") the products of combustion do not come in contact with the water. This is a great advantage, which is not obtained in the "Champion" and "Surprise" geysers. In the "Fuel" geyser the heat is obtained from coal or wood, and in the "Success" oil is the heating agent. Some general hints are given on geyser ventilation, and appliances are shown for reducing the risk of down-draughts, but more might with advantage have been said on this subject, as great annoyance is often caused by down-draughts in the flue-pipe leading from a geyser. In windy weather sudden gusts of air may pass down the pipe and blow the gas flames through the openings till the whole geyser is a sheet of flame. In cold, still weather there may be a steady down-draught in the pipe with the same result, but in this case the current can easily be reversed by closing the door of the bathroom and opening the window. Among the other apparatus illustrated in the catalogue are towel-warmers, urns, boilers, and copper and iron baths. The catalogue cannot fail to be of service to architects and plumbers.

Messrs. Winser & Co., Ltd., send us their new catalogue of sanitary appliances. Many of the drainage goods of this firm are already well known, and need not be described in detail. An important feature of this new catalogue is the section on "Iron Drainage," which contains illustrations of iron pipes, bends, junctions, traps, sewers, and inspection covers. The "Imperial Chambers" are well worth notice. These are really the floors of inspection chambers, each being in one piece of cast-iron. It is said that patterns for 300 different chambers are kept in stock, ranging in size from 1 ft. 6 in. by 1 ft. 6 in. to 1 ft. 6 in. by 6 ft. The main channels are 4 in., 5 in., or 6 in. wide, and as many as seven branches on each side can be provided in the largest chamber. Iron raising pieces can be supplied to take the place of brick walls. The iron is coated with Angus Smith's solution. Various kinds of manhole covers (both air-tight and perforated for ventilation) are illustrated in the catalogue, as well as grease and other gullies, flush-tanks, drain-plugs, sinks, lavatories, and water-closets. It is an interesting and useful catalogue.

From Mr. John Jones, of Chelsea, we have received an illustrated catalogue of "Improved Sanitary Goods and Specialities." The first illustration represents an intercepting chamber with pipes instead of the usual channels; all the fittings are of cast-iron, including the intercepting trap (fitted with a ventilation arm), the clearing arm and junction, and the main pipe which is fitted with a double-seal inspection cover. Cast-iron channels and junctions for junction chambers are shown, and various cast-iron traps, bends, manhole-covers, &c. Stoneware traps and channels are also shown. The sanitary fittings illustrated include baths, lavatories, sinks, urinals, and water-closets, but these do not call for special mention. The last section of the catalogue is devoted to drain-testing and drain-clearing appliances. Among the drain-testing appliances we notice two expanding screw stoppers with indicators attached for registering the amount of leakage under the hydraulic test.

The Stanhope Water Engineering Co., Ltd., of 20, Bucklersbury, London, send us a pamphlet of twelve pages containing illustrations and descriptions of the "Stanhope" water softeners, purifiers, and heaters. The water softeners and purifiers are designed for softening water in large quantities for steam boilers, laundries, town supplies, and trade processes. Softening is effected by a solution of lime or carbonate of soda, or both, according to the nature of the ingredients causing hardness in the water. The mechanism is simple and ingenious, the supply of the softening solutions being automatically regulated by the amount of water drawn from the tank containing softened water. The combined softener and heater for the feed-water of boilers is on similar lines, but means are provided for heating water by exhaust steam. The "Stanhope" softeners are already in operation at many places in the Metropolis, and will prove of great value in reducing incrustation in boilers and pipes, in saving soap in laundries, and in other ways.

"Notes on Non-Conductors of Heat" is the title of an illustrated pamphlet received from Messrs. Fred. Jones & Co., of Perrin-street, Kentish Town, the well-known manufacturers of silicate cotton or slag wool. A brief account of the process of manufacture is given, and this is followed by records of experiments showing the valuable non-conducting qualities of the material as applied to steam pipes, hot-water pipes, and refrigerating chambers.

The leaflet for December sent out by the General Electric Co. describes several very interesting inventions. The "Batten" patent rectifier is a cheap apparatus which will enable householders supplied with alternating current to obtain direct current for charging accumulators, working induction coils, &c. It consists practically of a polarised relay the tongue of which moves synchronously with the alternating current, and thus sends unidirectional current into two branched paths. By its means we can get two circuits, each carrying what is practically 6 amperes of direct current at a pressure of 25 volts. Each of these circuits would do excellently for charging the accumulators used for motor-cars and for carriage lighting. There has been a demand for an apparatus of this sort, and this is the first practical solution of the problem we have come across. The General Electric Co. are also making accumulators for use in connexion with engines, motor-cars, and launches where petrol is used for the motive power. One of these will enable an 8-h.p. motor-car to run about 1,000 miles on one charge. Another novelty the company advertises is an automatic cut-out with equivalent resistance for arc-lamps, which is very neatly designed.

Messrs. J. Sagar & Co., of Halifax, send us sheet lists of their improved tenoning machine and power mortising and boring machine. The first of these, notwithstanding its name, was designed specially for those users who have not sufficient work to justify the adoption of a machine for tenoning alone, and it is available for making tenons of different kinds, for cross-cutting, and grooving. The second machine is designed for mortising and boring either hard or soft woods, and as the boring-bit is in a line with the mortising chisel the timber can be placed under either at one setting. Both the machines are of good design, and are evidently of substantial construction.

Illustrations.

DESIGN FOR TAPESTRY HANGINGS FOR A MUSIC-ROOM.

THE design is by Miss Mabel B. Keighley, of the Plymouth School of Art, and gained for its author a gold medal in the South Kensington "national" art competition.

In explanation of the design, Miss Keighley writes that it is intended to suggest the employment of music in a marriage hymn. The panels on the left plate in our illustration would, in execution, go one on each side of the centre panel shown in the right-hand plate. The centre figures in this latter represent the bride and bridegroom; the child on the step, "Love" or "Hymen"; the musicians and the angels in the side panels, terrestrial and celestial beings joining in the hymn of praise.

The embroidery is upon hand-wove linen from the Windermere Spinning Industry, of a deep grey tone; the stitches are worked upon a frame, in Harris flax threads in reds, blues, greens, yellow, orange, black, and white, with gold and silver thread; but all subdued in tone by the grey of the background.

The whole of the design, including the embroidered specimen, has been purchased by the Board of Education.

ROYAL VICTORIA HOSPITAL, BELFAST

THIS hospital, of which we give two views and a plan, is designed by Messrs. Henman & Cooper, of Birmingham, and is planned on the lines suggested by Mr. Henman in a letter in our issue of August 8, 1896, in which he advocated the treatment of hospitals and infirmaries as "health manufactories," and went on to urge the desirability of their being planned with special regard to their admitting of perfection of work accomplished with ease and despatch, against which he considered the "pavilion" system militated, necessitating, as it undoubtedly does, the traversing by the traffic of the building of long distances both vertically and horizontally, in corridors, staircases, and lifts. He then proceeded to suggest the placing of the wards, all on one story, side by side, and lighting them principally by continuous lantern lights, an arrangement rendered possible, of course, only by a development to the full of "Plenum" ventilation. In 1898 Mr. Henman was commissioned to prepare a design on those lines by the Committee of the Belfast Royal Victoria Hospital. The scheme went through various stages of development, which we need not detail, all tending, however, towards the fullest utilisation of the possibilities of Plenum ventilation; and, finally, working drawings were prepared, in conjunction with his partner, Mr. Thomas Cooper, and a tender accepted from Messrs. McLaughlin & Harvey, builders, of Belfast and Dublin, for the erection of the buildings.

The following is the architects' further description of the building:—

"The plan will show very clearly what compactness of arrangement this new departure in hospital construction admits of. We have here seventeen wards on one floor and side by side, four physicians and four surgeons having each his own pair of wards—male and female—while the seventeenth is specially reserved for gynæcological cases. Each pair of wards on the medical side has a kitchen, a doctor's room, two bathrooms, and two wards of two beds each, while each group of four wards has its classroom.

On the surgical side each pair of wards has a

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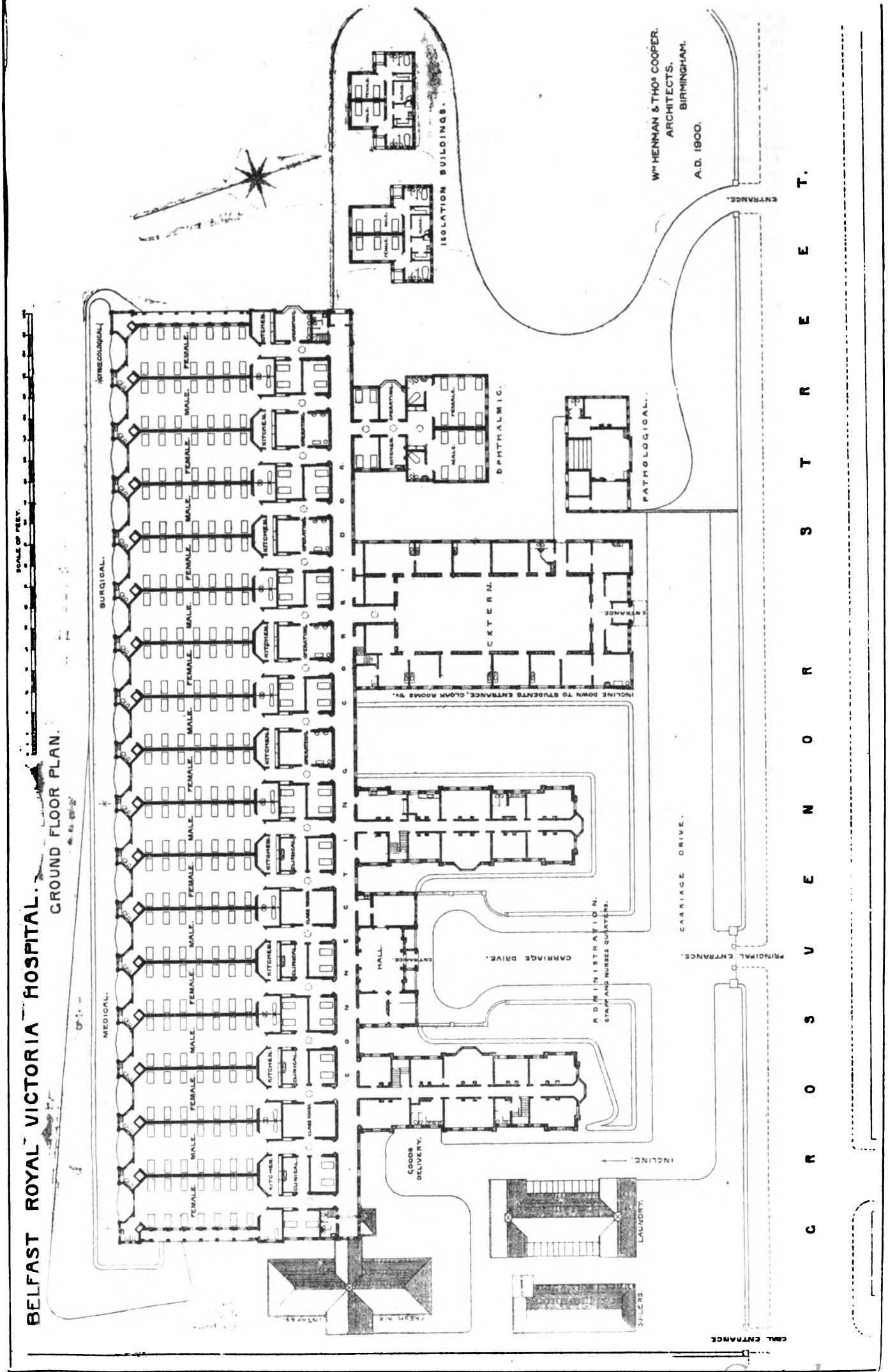

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kitchen, two bathrooms, and two wards of two beds each, as before, and also has a large operating-room. The gynæcological ward at the extreme western end of the group has its own operating-room, kitchen, bathroom, and two-bed ward.

Each main ward is separately approached by its own branch corridor, on either side of which are placed the above-mentioned subsidiary rooms, with stores for linen and patients' clothes.

Every main ward has its axis running north and south, and is lighted at its southern end by large windows with French casements opening into a roomy balcony looking over the hospital gardens, and flanked by the sanitary turrets attached to the wards. These main wards are all of one size, 58 ft. by 24 ft., containing fourteen beds each, and are all additionally lighted on both sides by continuous and nearly vertical lantern lights. Fresh warm air is admitted at a height of 7 ft. above the floor between each pair of beds, and the vitiated air finds exit at the floor level below every bed and is conveyed thence to the outlet ventilator in the roof of the sanitary turret. The air of the ward being constantly under slight pressure will naturally flow outwards, and therefore disconnecting lobbies to the sanitary turrets have been dispensed with.

All the accommodation we have been describing lies to the south of the principal corridor, running east and west, while north of it lie the administrative buildings, the out-patients' or extern department, and the ophthalmic block.

The administrative buildings consist of a low central block containing the entrance-hall with other rooms, and of two four-story wings housing the medical staff, the dispense department, the matron, nurses, and servants. In the basement the kitchens, porters, and stores are provided for, with rooms for noisy patients.

The extern department comprises a large waiting-hall, top-lighted like the wards, with its attendant consultation and other rooms ranged round it on all sides, and is entered at the northern end, and communicates with the main corridor at its southern end, by which communication in-patients will enter the building. Below it are rooms for students—male and female—attached to the hospital.

It may here be mentioned that in this hospital medical teaching is a feature of its administration, for which purpose the classrooms previously mentioned are provided.

The ophthalmic building receives sixteen patients in two wards of six beds each and two of two beds, and has its own operating-room, kitchen, &c.

Septic wards for six and infectious wards for four patients are arranged in two detached buildings, each with its own kitchen, nurses' room, and all necessary adjuncts, and in a third detached building are the mortuary and post-mortem theatre and pathological rooms.

The total hospital accommodation thus provides for 300 patients' beds, while the resident staff includes eight medical and surgical officers, seventy-six nurses, and thirty-two male and female attendants and servants.

In the engineering arrangements the architects have had the valuable assistance of Mr. Henry Lea, the consulting engineer, and in this department it is hoped to show a very decided advance on what has been hitherto accomplished, in the way of simplification of the appliances and a lessening of the cost of their efficient maintenance.

By the use of the exhaust steam from the engines for the heating of the hot-water supply of the building, a large deduction may reasonably be made from the cost attributable to the employment of mechanical means for ventilation.

The air-intake buildings lie at the east end of the main corridor, below which runs the great air duct of the hospital, 20 ft. by 9 ft., in sectional area at the intake end. This main air duct in its course westward gradually diminishes in height as it gives off supplies to the several branch ducts, this diminution of height following a rise in the natural level of the ground from east to west. Engines and air propellers are provided in duplicate, each of sufficient power to supply the minimum amount of air required by the whole hospital, thus allowing for all the contingencies of cleaning, rest, and repair of machinery. Without the opening of any windows a change of air seven times an hour in winter and ten times in summer, has been allowed for the whole cubic capacity of the building, exclusive of the administrative block, which, being of a residential character is provided with fireplace, heating, and ventilation in the ordinary way, supplemented by hot-water heating.

The boiler house and steam laundry buildings are at the north-east end of the site. A destructor and disinfecting apparatus are also provided.

Externally the hospital has been advisedly treated with great simplicity in red sand stock brick with dressings of Giffnock stone, the Committee having made a very strong point of concentrating the expenditure upon completeness and thorough efficiency of internal arrangement and fittings.

The total cost of the buildings will not exceed the sum of 300*l.* per bed, a particularly low figure for so completely appointed a hospital.

Associated with the work should be mentioned the names of the quantity surveyor, Mr. W. H. Stephens, of Donegall-square North, Belfast, and of Mr. G. A. Flower, clerk of the works."

THE QUEEN VICTORIA MEMORIAL: A SUGGESTION.

MR. W. H. LYNN, of Belfast, has sent us the plan here published, as a suggestion for a further development of Mr. Aston Webb's plan for the Queen Victoria memorial. The following is Mr. Lynn's description of his intention in the plan:—

"Mr. Aston Webb's bird's-eye view of his design looking towards Buckingham Palace, published with your issue of November 2, suggested the possibility of continuing the curved lines of the colonnades backward to form a circular enclosure to the Memorial site, and of connecting them with the Palace, to associate the latter more distinctly with the general design. I send you the outcome of a rough trial plan aiming at this.

In points of detail Mr. Webb's design was followed as far as possible; but in the effort to include the whole within the limits of his plan, some variations were unavoidable; for instance, the setting back of the front colonnade from the surrounding road line—the sufficient space this would leave for ornamental treatment, between the colonnades and the footway, would perhaps be no disadvantage.

The circular form of enclosure necessitated an advance of the Memorial eastward; also a change in the form of the Palace forecourt. By the former, the line of traffic passing north and south, in front of the Memorial, would be removed so much farther from the Palace. In the latter the forecourt is enclosed at the sides by the arched screens connecting the colonnades with the Palace block; and in front by the curved lines of the railing and entrance gates—the latter rather in advance of Mr. Webb's enclosure, and on good driving lines, to and from the Palace. The forecourt would thus seem to be rendered more private, while the triple archways or screens form stately entrances to the court from the side approaches.

I indicate solid backs to the colonnades forming wings to the Palace, with a view to imparting solidity of effect to them as wings, and as forming a background to the Memorial and the circular court. On the outside the walls could be relieved by engaged columns, and niches with statuary. The larger pedestals on the line of the inner circle suggest equestrian statues.

If the western half only were carried into execution, it would present a by no means incomplete appearance."

COMPETITIONS.

SCHOOLS, CHADDERTON.—In a competition for Stanley-road schools, Chadderton, the assessor, Mr. A. N. Bromley, Prudential-buildings, Nottingham, has placed first the design of Mr. Charles T. Taylor, A.R.I.B.A., Oldham. The second premiated design is by Messrs. Winder & Taylor, Oldham; the third by Mr. Richard Holt, Liverpool; and the fourth by Messrs. Cheers & Smith and J. & H. Aspinall (joint), Blackburn.

EXTENSION OF WIMBLEDON PUBLIC LIBRARY.—In the limited competition held recently for the extension of the Wimbledon Public Library, the design submitted by Mr. R. J. Thomson, A.R.I.B.A., of Hill-road, Wimbledon, has been accepted for the work, which is to cost 2,500*l.*

METROPOLITAN ASYLUMS BOARD.

THE usual meeting of this Board was held at the Boardroom, Victoria Embankment, on Saturday.

The Joyce Green Hospital.—In view of the near approach of the Christmas holidays, the Works Committee reported that they had replied to a Local Government Board communication in which that Authority stated that it would be necessary for plans and a complete estimate of the cost of certain works to be submitted for their approval. The Committee had replied that the Local Government Board were already in possession of the plans, but that a copy of the working drawings forming the basis of the contract would, when completed, be forwarded. The Board approved of the action of the Committee.

Accommodation at South Wharf.—The same Committee reported that at an extraordinary meeting of the Managers, approval was given to plans prepared by Messrs. T. W. Aldwinckle & Sons, architects, for the erection of receiving-rooms, isolation ward, and male staff quarters at South Wharf, Rotherhithe, and for the erection of a detention shelter at North Wharf, Blackwall, and directed that when the approval of the Local Government Board had been received, the plans should be referred to the Committee with instructions to take such action as might appear to them to be requisite to secure the completion of the buildings at the earliest possible date. In view of the urgency of the matter, the architects were instructed to submit to them a tender from the contractors for the permanent buildings now in course of erection at South Wharf for the erection of the proposed additional buildings. In this tender, amounting to 5,936*l.*, which was before them at their meeting, Messrs. Walter Lawrence & Son, the contractors, guaranteed to complete the buildings within eight weeks from the date of the order to commence, subject to a reduction from the contract sum of 100*l.* per week for every clear week after the period during which the said buildings should remain unfinished. The recommendation of the Committee in favour of the acceptance of the tender was adopted. Subsequently, the Committee mentioned that the Local Government Board had already approved the plans (with some minor alterations), and it being imperative, in view of the inadequacy of accommodation for patients at both the South and North Wharves, that the buildings should be erected without further delay, they (the Committee) had directed the architects to instruct the builders to proceed with the works forthwith. The Committee had also, at the request of the Ambulance Committee, authorised the provision in a temporary building at South Wharf of eight additional cubicles for the male staff.

BOOKS RECEIVED.

CENTRIFUGAL PUMPS, TURBINES, AND WATER MOTORS. By Charles H. Innes, M.A. Third edition, revised. (John Heywood.)

Correspondence.

To the Editor of THE BUILDER.

"THE DIRECT EMPLOYMENT OF LABOUR."

SIR,—To find myself suspected of advocating this system is so refreshing that I am tempted to pursue the matter a step further. It would be false modesty to disclaim the amount of insight into the practical aspect of direct employment with which Mr. Wallis would credit me—I am writing of that which I have viewed from all sides.

Mr. Chappell has not caught my argument. The savings I enumerated are such as may naturally occur to the owner who thinks of dispensing with the contractor; whether he will actually secure them depends on good management and good luck. The ordinary building owner willingly pays more money to a contractor than he may be advised that the building would cost by direct employment, because he cannot afford to run the uninsurable risks. The owner who can afford it will take his chance. I will not here go into the question of trade discounts which was touched upon in my recent paper at the Surveyors' Institution, but those who supply building materials and accessories are of the same flesh and blood as other manufacturers and merchants. Show them gold, and I have enough evidence that if one will not do business on the lowest terms that he can afford, another will. The owner whose money is ready must save the interest which the contractor has to pay while he is waiting for the owner's cheque. If he gets a bright and honest manager who is properly supervised by the architect or surveyor, he will also save the contractor's profit, or some of it. As to friction between employers and employees, let your correspondent not despond for the private owner. His class already pays in the shape of enhanced tenders for all the disputes between contractors and workmen, and they have to sit down helpless during strikes. One of my friends had such troubles as Mr. Chappell prognosticates. They might have ruined a contractor, for every job he had got would have been struck, and his establishment charges would have gone on piling up. But this man just paid everybody off and locked the gate till workmen turned up. There was no expense and but little delay.

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In dealing with the question of direct employment, I would keep clear of labour questions, and if my opinion is of any value, I may say that while contractors manage their business with intelligence, they are not likely to be swept away by the rival system. If I were in want of a new house, I should invite a limited number of tenders and accept the lowest.

THOS. BLASHILL.

ANCIENT THEATRES IN CRETE.

SIR,—The article on Cretan theatres in the *Builder* of December 7 very much interested me, as, in being architect on the Knossos Excavations, I have come across some of the places mentioned by your correspondent. A few up-to-date particulars may be of interest.

Fragments of the ruined building at "Gnosso" exist to this day, and it is indicated as a probable Roman basilica on the General Survey plan of the site of Knossos, published in the Annual of the British School of Athens for 1899-1900.

Near it, lying across the present main road, are distinct traces of a Roman amphitheatre, and, more interesting still, an important Roman mosaic is known to exist quite close to the basilica. This, it is hoped, will be investigated when the Cretan Exploration Fund has money enough to completely explore the Knossos site outside the palace. Other fragments, which may be Roman, exist in the vicinity, but it is difficult to date them accurately now. In the case of the basilica, we have evidence of a definite plan on a large scale, the fragments of walls and piers being some 5 ft. above the ground in places, and composed of a rough rubble of stones and mortar, which has stood the wear of time through the excellence of the cementing material.

In turning to another site mentioned, that of Lyttos, it may be noted that modern archæologists fully bear out the reflection of De Belli's on the perplexing nature of the ground. Only one fragment of the vast aqueduct which he mentions appears to exist to-day, and is in the actual vicinity of the site of Lyttos. The note about the water having been carried from the mountains of "Sasati" is interesting, and at once suggests the outlet among caverns, which descends into the bowels of the earth at the end of the Plain of Lasithi, about 1,500 ft. above Lyttos. This plain is in the heart of the Lasithi Mountains, the third highest range in Crete, and the outlet above mentioned goes into the earth and reappears in some springs which are beside the present devious mule track, uphill from Lyttos to Lasithi. Lasithi is one of the most fascinating parts of Crete, and is described by Mr. D. G. Hogarth in the account of his exploration of the Dictæan Cave, published in the *Monthly Review* at the end of last year. The site of Lyttos, which is one of the concessions of the British, has yet to be explored.

Chersonesos (I give the modern spelling), which is mentioned in connexion with Lyttos, is also unexplored, but it does not offer many promising indications. A piece of Roman mosaic exists above ground almost on the rocks by the seashore.

But by far the most interesting Greek and Roman site in Crete is Gortyna. The disposition of the temple here is quite intact, showing a hall with the bases of a double row of columns, an atrium, and some paving leading to a statue pedestal in front. Professor Halbherr, the Italian archæologist, is at present working on the great inscription of the Laws of Gortyna, the finest archaic Greek inscription known; it is chiefly written round the inside of what must have been a circular building some 100 ft. in diameter.

The parts that have been already disclosed show beautiful Greek masonry about 6 ft. high.

D. T. FYFE,
Architect to Cretan Exploration Fund at Knossos.

SIR,—The plans of ancient theatres in Crete published in the *Builder* of the 7th inst. with letters describing the buildings as they existed in the sixteenth century, reopen more than one question that has baffled the archæologists of many generations. It will be remembered that some of these plans show what appear to be concentric rows of columns occupying the *praecinctiones*, for the purpose, it has been assumed, of supporting a roof.

The largest of these theatres, which is 435 ft. in diameter, has three such rows, and the "columns" are arranged on lines converging to the centre of the orchestra. Thus the intercolumniations are made to vary from about 40 ft. in the back row to some 20 ft. in the front; this disparity is rather against the roof theory, unless we accept a velarium, and it seems to have been determined by reasons other than constructional. As mentioned in your article, coverings or roofs were provided for music theatres for the purpose of retaining the sound; but for theatres where perfect lighting and an uninterrupted view of the stage were essential, other methods were sometimes adopted to improve the acoustic properties. In this connexion it will be remembered that Vitruvius has a chapter "On the Vases used in the Theatre," and as the probability of his account has been doubted by one of his English translators, it is satisfactory to have the evidence which is contained in the letters you have published.

According to Vitruvius, bronze vases were sometimes arranged amongst the seats, in musical order, in cavities prepared for the purpose, but so as not to touch the wall in any part, and opposite to the cells openings were left in the beds of the lower seats. We cannot tell exactly where these cavities were placed, but Vitruvius goes on to explain what should be their general arrangement; at the same time he is careful to mention that he knows of no instance of their use in Rome, but such may be seen in some of the provinces of Italy and many in the Grecian States. If the theatre is of moderate size, thirteen cavities must be ranged round at half its height and at equal distances apart; but if it is on a larger scale the height is to be divided into four parts, so that three ranges of cavities may be provided, the bottom range to have thirteen, the middle twelve, and the top thirteen. The following extracts bearing on this point are taken from the letters: "The Great Theatre of Litto is the largest ever constructed in the Kingdom of Candia. It had three ranges of copper vases contrived for the purpose of increasing the sounds, and nearly all the cells where these were placed may still be seen." Again: "The Great Theatre at Gierapetra also had an arrangement of copper vases, as may be seen by the cells which remain in an intact condition."

A reference to the plans that accompany these letters will show that the ranges of supposed "columns" agree exactly with the ranges of cells as above described, and in one instance the number of the columns is the same as that given by Vitruvius for the vases. In the other cases the discrepancy in the numbers is so slight that it may be accounted for by the carelessness that led to the omission of the *cunei* on the plans, or possibly the Vitruvian rules may not always have been strictly adhered to. It seems to be a question, then, whether we have not on these plans of Cretan theatres some evidence rather of the acoustic arrangements described by Vitruvius than of a permanent roof.

JOHN A. MARSHALL.

THE BRICKLAYING TRADE.

SIR,—My attention was arrested by the straightforward query you appended to the letter of "One from the Bench," viz.:—"Are men *compelled or* persuaded to do far less work in a day than they could do and used to do, *at the orders of and* in the interests of *the trades-unions*"?

An authoritative answer to this query as it stands cannot, I opine, be given by any individual. This seems to have been realised by your several correspondents, for I notice that, with one exception, no attempt has been made at reply. One can, however, be possessed of an opinion, and I personally have in the whole of my experience, which has been varied indeed, never heard of a bricklayer receiving such orders, and, further, I believe to the best of my belief that such orders have ever emanated from any trade union office; this the more strongly because the mere idea appears to me absurd.

If, however, we eliminate from the query the words I have taken the liberty to italicise, and substitute the word "themselves" for "the trades-unions," we have left a query to which every one actually associated with the trade can immediately answer, yes.

Thus far every shade of employer and employee are in agreement, but when we seek the cause of the reduced output, we find the former prone to put the blame on the trades-unions, whereas employees generally give entirely different reasons.

Before proceeding, perhaps I may be permitted to explain my own position:—1. I do not lay bricks nor have I any direct interest in the amount of work done. 2. I know very little about trades-unions. 3. I seldom read a newspaper, and never the *Times*, for a reason I need not here state. I have read no correspondence on this matter excepting what has appeared in your paper.

Now, Sir, "that bricklayers lay less bricks in a day than they used to do"—say, ten years ago—there can be no doubt. And that there is great difference of opinion as to the cause of this is not to be wondered at when we realise that this question is to the financier and the average employer a simple factor in a complicated sum, but it is the governing factor of the very life of the operative. In my opinion, trades-unionism has certainly played an important part in the change under consideration, not by any such silly process as ordering its members to do less work, but rather by bringing the men more closely into touch with each other, and creating a feeling of goodwill in the place of personal distrust and antagonism that at one time existed; by focussing their energies upon certain definite projects with one end in view—to better their position. And I would ask who is he that, having worked along the line during the winter of 1891 and 1892—that following the carpenters' strike—will now come forward and say that some improvement was not absolutely necessary?

At that time the treatment men received at the hands of some foremen—whose action, I presume, the employers condone—was such as good owners would scruple to apply to animals. Hundreds of bricklayers were walking about the streets of London looking for work they could not obtain. A demand—to expire in May, I believe—had been given for an increased wage, and the employers, intoxicated with their triumph over the carpenters, strained every nerve to prevent the O.B.S. preparing for the prospective struggle.

One method by which several employers sought to intimidate the men was to regularly discharge numbers of men at all hours of the day. On the job upon which I myself was working I have known men stopped at breakfast-time, noon, and evening—not by ones and twos, but by twenties—for no apparent reason whatever, unless it be the following given by an intelligent (*sic*) foreman, "Show them who they are."

Sir, can one wonder that these men, once they realised that they had the power to practically control the amount of work done, should exercise such power, and, remembering the sweetness of revenge, would they not have been more than human had they never abused it?

But enough of this that is known to all directly interested. One's time will be better employed in seeking a remedy for the evil present. Let us realise that mechanics of to-day know their power far too well to be easily intimidated or forced aside from their object by any acts of recrimination rendered practicable by the ever-varying fortune of supply and demand. Let employers of men accept the fact that salvation is to be found in better management and better organisation—not of a clique, but of their own business.

Confining my remarks to that part of the subject of management that I am acquainted with—the foremanship of bricklayers—the day of the bully is gone, and in his place is required a master workman possessing no mean degree of tact, the ability to discriminate and weed out from his gang the lazy and the incompetent, to be quick in discerning the most effective way to get from any man the maximum amount of work under prevailing conditions. Such an one will see that his men always are properly supplied with material in the most convenient form possible; that the amount of work apportioned to each man is such as to prevent any unnecessary waste of time; and, above all, he will set the example of taking pains with his work. Nothing demoralises a gang of men more than having to alter work done.

The foreman I have sketched is born, not made. Fortunately, plenty exist, if contractors and their managers had only the powers of discrimination necessary to pick them out. This is done in some cases, and the fortunate and, indeed, meritorious contractor grows rich whilst his confrères grumble their way to the bankruptcy court.

BRICKLAYER.

*** We never supposed that written orders or rules for shortening output of work were issued by trade-unions; but are there no unwritten ones? At all events, our correspondent "gives away" the working men in his admission that their "goodwill" for each other leads them to concur in mutual arrangements for doing as little as possible.—ED.

LLOYD'S-AVENUE, FENCHURCH-STREET.—On Monday last Lloyd's Register of British and Foreign Shipping removed into the new premises built for that Society at the corner of Lloyd's-avenue and Fenchurch-street, by Messrs. John Mowlem & Co. as the general contractors, after Mr. T. E. Collcutt's plans and designs—illustrated, with a plan of the ground floor, in our number of August 31 of the current year. For a block of offices on the western side of the avenue to be erected for Lloyd's-avenue Estate Co. designs have been prepared by Messrs. Davis & Emmanuel.

BIRMINGHAM SCHOOL BOARD ARCHITECTURAL WORK.—At the forthcoming meeting of the Birmingham School Board the Sites and Buildings Committee will recommend that three months' notice be given to Messrs. Martin & Martin, architects and surveyors, to terminate their engagement, all work which they have now in hand for the Board to be completed by them on the existing terms; that the Board advertise for an architect to be the architect to the Board for new works, at a rate of remuneration of 7s. 6d. per scholar of accommodation, plus 1½ per cent. for taking out and furnishing quantities, the engagement to be for three years, with a clause for determining the same at three months' notice on either side at any time; that the Board advertise for a land surveyor at a commission of ½ per cent. on the purchase money; and that the Board advertise for a superintendent of buildings for alterations and repairs, at a salary of 250*l.* per annum, to devote all his time to the duties and to the work in the Board's offices, all necessary office furniture, stationery, &c., being provided by the Board.—*Birmingham Post.*

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The Student's Column.

GAS AND GAS-FITTINGS.

24.—THE PURIFICATION AND COMBUSTION OF ACETYLENE.

THE IMPURITIES IN COMMERCIAL ACETYLENE.—Commercial calcium carbide usually contains small quantities of calcium phosphide, calcium and magnesium nitrides, and aluminium sulphide. These compounds are decomposed under the conditions which exist in acetylene generators by reaction with water, and cause the acetylene to become contaminated with certain objectionable gaseous impurities. Phosphuretted hydrogen is evolved during the decomposition of the calcium phosphide, ammonia during the decomposition of the nitrides, and sulphuretted hydrogen during the decomposition of the aluminium sulphide. In addition to these gaseous impurities, the acetylene gas as it flows from the generator also contains more or less water and finely divided lime mechanically suspended in it, and it is a matter of importance that these should be removed by passing the gas through a condensing coil before the gas is allowed to pass into the gas-holder.

Liquid Drawn from the Condenser.—A considerable proportion of the water present in the acetylene as it leaves the generator may be removed by passing the gas through a condenser, and the condensed liquid which is from time to time withdrawn is found to contain a considerable quantity of other impurities. A sample of liquid drawn from the condenser of an acetylene generator has been found by Professor Lewes to contain the following substances :—

	Grams per Litre.
Lime	16·28
Sulphur	6·92
Phosphorus	4·01
Iron and Alumina	0·19
Ammonia	7·14

It is evident, therefore, that by simply passing the gas through a condensing-coil it may be purified to a certain extent, and for outdoor illumination it is not necessary to subject the acetylene to further purification, but for indoor use it should be more completely purified.

Frank's Acid Cuprous Chloride as a Purifier.—For the more complete removal of the ammonia, sulphuretted hydrogen, and phosphuretted hydrogen, many systems have been proposed, but few are of any value for domestic use. Frank's purifier, consisting of a solution of cuprous chloride in hydrochloric acid has proved one of the most successful. The siliceous porous earth known as keiselguhr may be impregnated with this solution, since it is not attacked by the acid solution, and simply acts as an absorbent. It is found that the solid material thus prepared is less objectionable to handle than the liquid. The ammonia in the gas is neutralised by the acid and is converted into ammonium chloride, the sulphuretted hydrogen is decomposed and produces a black precipitate of copper sulphide, and the phosphuretted hydrogen is partly absorbed and partly precipitated as copper phosphide.

Ulmann's Chromic Acid as a Purifier.—Another good purifying agent is the solution of chromic acid acidulated with sulphuric acid proposed by Ulmann. This liquid also removes ammonia, sulphuretted hydrogen, and phosphuretted hydrogen from the acetylene.

Bleaching Powder as a Purifier.—Bleaching powder may also be used for the removal of sulphuretted hydrogen and phosphuretted hydrogen, but the ammonia must first be removed by other means, because it may possibly react with the hypochlorite of lime to form an explosive chloride of nitrogen. The hypochlorite of lime in the bleaching powder oxidises the phosphuretted hydrogen and the sulphuretted hydrogen, and produces phosphate of lime and sulphate of lime respectively. To remove any traces of chlorine which may be carried forward from the bleaching powder, the gas after leaving a purifier containing bleaching powder should be passed through a vessel containing slaked lime. To render the bleaching powder more porous, Wolff mixes with it a small proportion of lead chromate, and the mixture then appears as a powder of a uniform yellow colour. Thorn and Hoddle employ a mixture of bleaching powder and oxide of iron.

It has been a common practice to mix sawdust with the bleaching powder to expose a larger surface of the powder to the action of the gas, but Ahrens has shown that under certain conditions reaction may take place between the sawdust and the bleaching powder and be accompanied by the evolution of heat. Sawdust should therefore be discarded in favour of keiselguhr, powdered coke, lead chromate, or other substance unaffected by the bleaching powder. Professor Lewes considers that every precaution should be used when adopting bleaching powder as a purifying agent, because many cases of spontaneous ignition and explosion have occurred when air has been admitted to bleaching powder purifiers which have been in use for some time, and because it has long been known that free chlorine may cause the explosion of a mixture of air and acetylene.

White "Haze" Produced by Combustion of Acetylene.—When acetylene has been burning for a considerable period in a room not efficiently ventilated, a white haze is sometimes apparent in the atmosphere. This haze is only formed when the acetylene has not been purified from phosphuretted hydrogen, and is due to the formation of phosphorus pentoxide, which has a remarkable affinity for water vapour, with which it forms phosphoric acid. An extremely small proportion of phosphuretted hydrogen will give rise to the white haze, and it is imperative that this impurity should be removed before the acetylene is consumed in confined spaces.

The formation of the haze may often be prevented by simply passing the gas through a condenser, then through a washer, and finally through a dehydrating material such as quicklime; but it is always safer to pass the gas through one of the purifying agents previously mentioned.

Combustion of Acetylene.—For complete combustion one volume of acetylene requires 12·5 volumes of air, whereas one volume of coal-gas requires only about 5¾ volumes of air. To enable the acetylene flame to meet with sufficient air for its complete combustion, it is necessary to supply the gas to the burner under higher pressure than that employed for coal-gas luminous flames, and to use burners having smaller orifices than those provided for coal-gas. To produce a luminous flat flame with coal-gas, a gas pressure of about ¾ in. is, as a rule, most suitable, but for acetylene the best results are usually attained when the gas issues from the burner under a pressure of about 3 in.

Bray Burners for Acetylene.—Bray burners for acetylene resemble Bray coal-gas burners in outward appearance, but have extremely small orifices. They give a good result for a time, but gradually become choked with a carbonaceous deposit. They can, however, be bought retail for 2d. each, and many acetylene consumers employ these burners, and discard them when they begin to yield a smoky flame, in preference to buying more costly burners which remain serviceable for a longer period.

The "Naphey" Burner.—The tendency of acetylene to burn with a smoky flame and to leave a carbonaceous deposit in the burner orifices greatly detracted from the practical utility of the gas when it was first adopted for domestic lighting. To overcome this trouble Bullier and others devised burners having air passages formed in the burner tip. A burner of this type is that known as the "Naphey" burner. It consists of a metal tube having two arms, which near their extremities are bent towards one another at right angles. The end of each arm is fitted with a steatite or lava tip having side holes for the admission of air, and a central passage for the exit of both gas and air. When the jets issuing from the two burner tips are ignited, the two flames impinge upon one another and produce a flat flame. Owing to the provision of the air holes, the flames do not quite touch the tips of the burner but burn just above them, and consequently the burner tips are not so speedily blocked with carbon as those of the Bray union-jet type. In these burners the air does not mix with the gas in sufficient volume to materially reduce its illuminating power, but merely forms an envelope around the issuing gas and protects it from contact with the heated burner tips.

The "Shaffer" Burner.—When the Naphey burner had been in use for some time it was found that the metal arms sometimes became warped, with the result that the two jets were displaced from their proper relative positions, and the flame became distorted and had a tendency to smoke. This trouble was, however, soon overcome by constructing the arms of the same rigid material as the burner's tips.

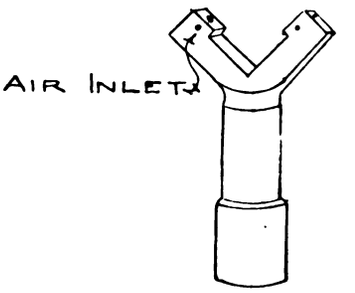

Fig. 61.—"Shaffer" Acetylene Burner.

Shaffer's burner (fig. 61) is a good example of burners of this type.

A host of burners of both the Naphey and the Shaffer type are on the market, but it does not come within the scope of the present series of articles to attempt to discriminate between them, or to discuss the various claims for priority of discovery.

The "Phôs" Burner.—A number of burners fitted with mechanical devices for removing the carbon deposits as soon as they are formed have been patented, but the only one which calls for mention is the "Phôs" burner (fig. 62). The construction of the burner will

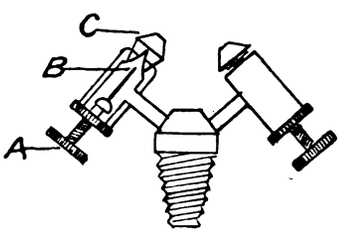

Fig. 62.—"Phôs" Acetylene Burner.

readily be understood by reference to the illustration. The deposit is removed by screwing up the button (A), which pushes the wire (B) through the burner tip (C). The arms of the burner are made of soft metal, which can be twisted into their proper position with the fingers if they become warped and cause distortion of the flame.

Importance of Uniform Pressure.—The gas pressure most suitable for the combustion of acetylene varies with different types of burner, but a pressure equal to about 3 in. of water is the pressure required for many of the burners in use at the present time. It should be remembered that every burner requires to be supplied with gas under a certain definite pressure, and that any departure from that point, whatever it may be, must result in a reduction in the illuminating efficiency obtained from the acetylene.

Incandescent Mantles with Acetylene.—From time to time acetylene burners of the Bunsen type have been constructed with the intention of using them in conjunction with incandescent mantles, but although a higher lighting efficiency may be obtained from the mantles with acetylene than with coal-gas, the former gas is at present too costly and too difficult to use in atmospheric burners to be suitable for incandescent lighting.

Cooking and Heating Appliances.—Acetylene can be used with specially constructed burners for cooking and heating purposes in the same manner as coal-gas, but it is more costly, and it is more difficult to construct satisfactory atmospheric burners for acetylene than for coal-gas, owing to the larger proportion of carbon contained in the acetylene and its wider range of explosibility. Acetylene has, however, been successfully adapted to ring burners for the boiling of water, and the troubles attendant upon its use as a heating agent for other appliances will no doubt be overcome after further experience. Luminous flames can be employed for heating and cooking in the same manner as luminous coal-gas flames, but have a greater tendency to emit free carbon.

25.—PIPES AND FITTINGS FOR ACETYLENE INSTALLATIONS—SOME PORTABLE ACETYLENE APPLIANCES.

PIPES AND FITTINGS.—All buildings in which acetylene is used should be quite free from any odour of the gas, and where an odour is present it is due to the

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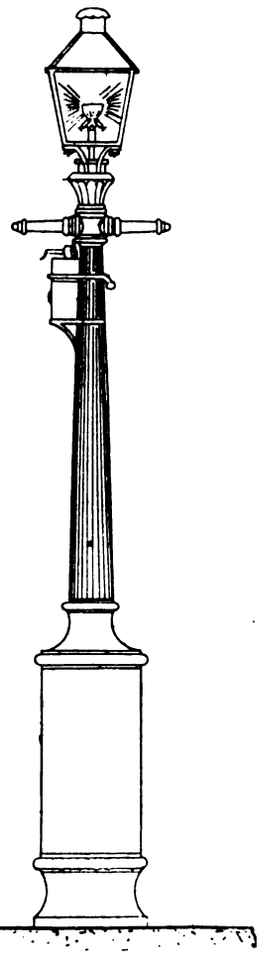

Fig. 63.—Generator Affixed Externally to Lamp Column.

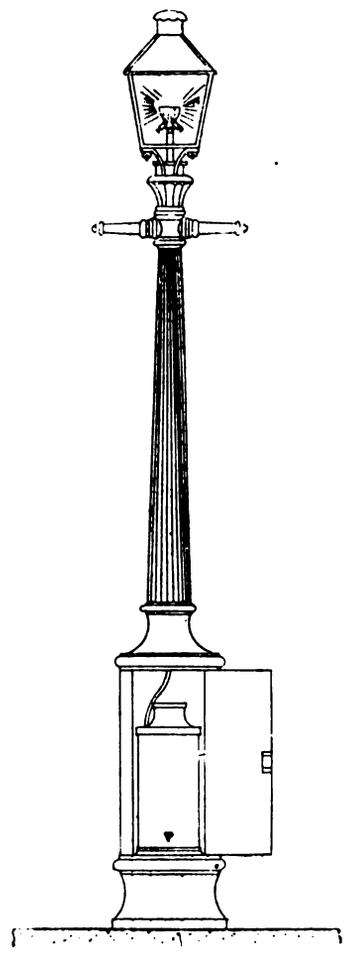

Fig. 64.—Generator Located in Chamber at Base of Lamp Column.

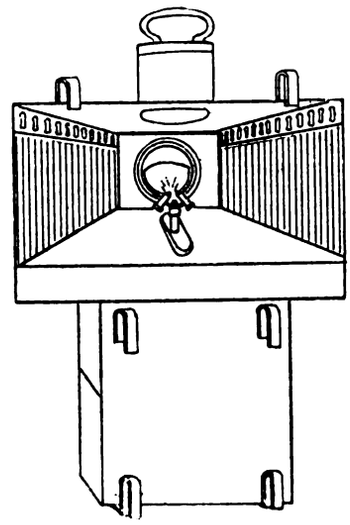

Fig. 65.—Acetylene Lamp for Cars or Omnibuses.

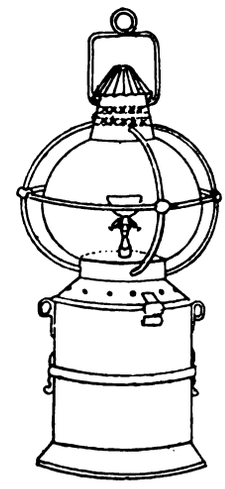

Fig. 67.—Acetylene Lamp for General Use.

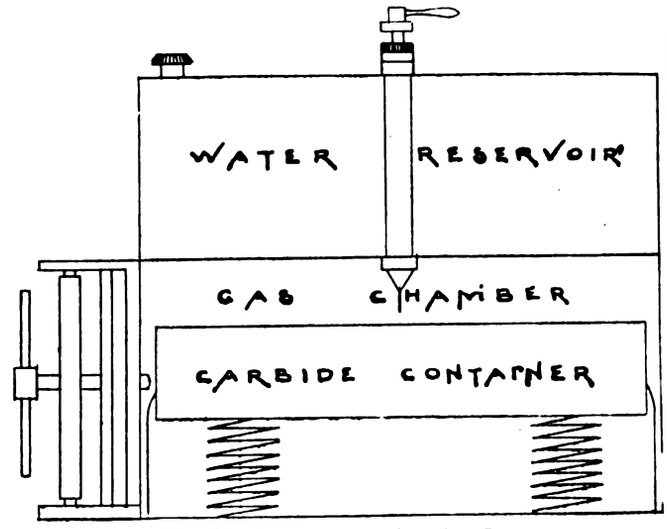

Fig. 66.—Generator for Omnibus Lamp.

use of defective pipes or fittings. No compo pipe should be employed, but all pipes should be iron barrel of the best quality, and should be connected together without the use of packing or paint. White lead mixed with oil, and other substances of a like nature commonly employed when connecting pipes for coal-gas distribution, should not be used, because they are attacked by the acetylene, and their cementing power is soon destroyed. The threads may be dusted with finely-ground plumbago, but the pipes should be sufficiently well made and threaded to enable gas-tight joints to be made without the aid of any cementing material. The brackets and pendants should be constructed of stout metal, preferably iron. Fittings of the best quality which have been used for coal-gas may be employed for acetylene if they are thoroughly overhauled and refitted by a competent fitter but cheap brass fittings of brazed tube must be rejected. When the work of connecting all the parts of an installation has been completed, the installation should be tested until found to be perfectly air-tight or gas-tight under a pressure of 20 in. of water. Before attempting to ignite the gas at any of the burners, the gasholder should be filled with acetylene, and a rubber tube should be attached to the gas-bracket or pendant most distant from the gasholder. The free end of the rubber tube should then be passed through a window into the open air, and acetylene from the holder should be allowed to pass through it until all the air in the pipes and fittings has been replaced by acetylene. The freedom of the acetylene issuing from the mouth of the rubber tube from contamination with air may be ascertained by passing the gas into an inverted test-tube. If the test-tube, after being filled with gas, is removed from the neighbourhood of the rubber tube, and the gas within it is ignited, it will burn quietly if free from air, but will ignite with a sharp explosion if air be present in dangerous quantity.

Acetylene should not be stored in the gasholder for more than forty-eight hours before it is required for consumption, because, owing to the fact that the gas is soluble in water, and that water saturated with acetylene and in contact with the atmosphere slowly yields up its acetylene to the atmosphere, an appreciable loss in volume occurs. This loss increases with the pressure under which it is stored, but the gas must nevertheless always be stored under slight pressure, because it is better to lose a certain proportion of the gas than to run that risk of permitting any air to enter the holder, which would exist if the gas were stored under a slight vacuum. The acetylene should by preference be generated and stored in the gasholder only a few hours before it is required for combustion.

Portable Appliances.—The high illuminating power of the acetylene flame, even when the gas is being consumed at the rate of only ½ cubic foot per hour, renders this illuminant very valuable for all kinds of portable lamps. For the temporary lighting of building and engineering works, for searchlights and signalling, for carriage and hand-lamps, for the lighting of camps, and for isolated lamps in village streets or public or private grounds, acetylene is admirably adapted. For portable lamps automatic generators have always to be used, and the carbide has usually to be broken into pieces of very small dimensions. The yield of available gas per pound of carbide consumed is not, therefore, so large as that obtained with stationary non-automatic generators. Portable acetylene generators can be constructed to meet almost every conceivable requirement, and the ease and safety with which carbide can be transported, and acetylene generated by simple contact of the carbide with water, renders acetylene much preferable to oil as an illuminant for outdoor use. A number of acetylene table-lamps for indoor use have also been devised, but none are altogether satisfactory, and the garlic-like odour of impure acetylene is generally more or less noticeable in rooms in which they are employed. Even if they do not emit an odour when in use, the operation of cleaning and recharging the generator cannot be performed without creating a nuisance. The cleaning may, of course, be performed in the open air outside the house, but only an acetylene enthusiast will use a lamp requiring such treatment throughout the cold winter months.

Street Lamps.—Street lamps may be lighted with acetylene generated at a central station and conveyed through small gas mains to the lamps in the same manner as coal-gas; but where isolated lamps in villages or carriage drives have to be provided, a small portable generator may be attached to the upper part of the lamp column as shown in fig. 63, or may be located in a lock-up chamber in the base of the column as shown in fig. 64.

Lamps for Cars or Omnibuses.—A large number of cars and omnibuses are now lighted by acetylene, the "Phôs" Company alone having undertaken to fit 2,000 of the London omnibuses with acetylene lamps in place of the oil lamps formerly employed by January 1 next. One of the "Phôs" lamps used for this purpose is shown in perspective in fig. 65, and the lower portion of the lamp in which the acetylene is generated is shown in section in fig. 66. The lamp is fixed on the right hand front of the car, and shows a light ahead at the same time that a comparatively brilliant light is thrown into the car. The carbide container is situated in the lower part of the lamp. The lid of the container is of wire gauze or perforated metal, and the base consists of a metal plate which is pressed upwards by a spring. The object of the spring is to press the upper layer of carbide against the perforated lid, and to thus ensure uniform and continuous decomposition. The water reservoir is situated above the carbide container, and is fitted with an adjustable

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valve from which water drips upon the perforated lid of the carbide container and comes in contact with the carbide.

All the different forms of "Phös" lamps are constructed upon this principle, although slight modifications in constructive details are made to render each lamp suitable for the particular purpose for which it is intended.

Lamps for Building Works.—Hand lamps consisting of lanterns connected to portable acetylene generators are made in all sizes and designs. A form of lamp suitable for use on building and engineering works is shown in fig. 67.

Cycle Lamps.—Patents have been obtained for a great number of acetylene cycle lamps, many of which closely resemble one another in all essential details; but few, if any, of the lamps are altogether satisfactory. In some the carbide has to be used in the form of cartridges, and it is often difficult to obtain these at the moment when they are required. In others the water is admitted to the carbide through a porous medium such as felt or cotton wick, and this soon becomes choked with lime. Others are provided with a carbide container of insufficient capacity, and the lamp goes out before the evening's journey is completed. Many of the lamps cannot be used without the generation of an offensive odour, and in many the gas continues to be generated for a long period after the lamp has been extinguished. In spite, however, of all these disadvantages, and of the fact that acetylene is more costly than oil, acetylene cycle lamps remain very popular, and are in demand in every part of the country.

Signal and Searchlights.—The brilliancy and penetrating power of the acetylene flame, and the ease and freedom from danger with which calcium carbide, as compared with oil, may be transported, renders it extremely valuable for military purposes, and it may also be used with advantage as a searchlight when the more powerful electric arc light is not available. It has been proposed that acetylene searchlights should be used by fire brigades to enable the men to see more clearly through the steam and smoke in which the burning structure is frequently enveloped, and generators mounted on wheels, like those often used by contractors, have already been constructed for this purpose. The acetylene signal and searchlights constructed by different firms of generator makers are usually supplied with acetylene from flexible pipes connected to small generators which work upon the same principle as those provided for domestic lighting. A projector to be used with acetylene for searchlight purposes, which is supplied by the "Bon-Accord" Company, and which is intended especially for use on ships, but is adapted for use in other situations, is shown in fig. 68.

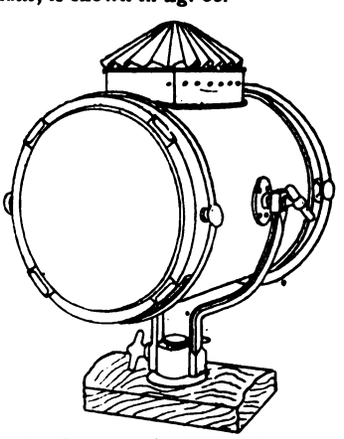

Fig. 68.—Projector for Use with Acetylene.

UNITARIAN CHAPEL, MERTHYR.—The foundation-stones of the new Unitarian chapel now in course of erection in Thomas-street, Merthyr, were laid recently. The new sanctuary, which is of late Gothic design and is to be constructed of brick with Bath stone dressings, provides accommodation for about 150 worshippers, and there is a school-room underneath, the total cost of the building, including the site, being about 2,000*l*. The architect is Mr. E. A. Johnson. The contract for the erection was first taken by Mr. John Jones, Glanynant, and upon his death it was transferred to Mr. Edward Lumley, who is at present carrying it out.

ROOD SCREEN, ST. PAUL'S, KNIGHTSBRIDGE.—The rood screen at St. Paul's, Knightsbridge, which was erected years ago from the design of Mr. G. F. Bodley, is to be decorated with a series of painted panels by Mr. N. H. J. Westlake.

GENERAL BUILDING NEWS.

ST. ANDREW'S-STREET BAPTIST CHURCH, CAMBRIDGE.—The design of Messrs. George Baines and R. Palmer Baines has been accepted for this new church, &c. The building is to be faced with whole white flints, the dressings, tracery, &c., being of red Mansfield stone. A square tower forms a feature of the design. The joinery is to be of oak. The seating accommodation is for about 950 persons, and the estimated cost is 6,200*l*.

YATTON CHURCH TOWER.—The tower of Yatton Church, one of the landmarks of Somerset, was rededicated by the Lord Bishop of Bath and Wells recently. Some time ago the tower and some of the parapets were found to be in an unsafe state, and parishioners were divided on the question of repair or rebuilding, those in favour of the former doing all in their power to secure the retention of the old work, with which were bound up so many old associations. Various meetings were held and expert advice taken, Mr. Detmar Blow, on behalf of the Society of Antiquaries, reporting that the tower could be repaired and made as efficient as if rebuilt. Mr. Edmund Buckle (diocesan architect), on the other hand, reported strongly in favour of rebuilding, and this latter course was at length adopted, and the work has been carried out by Messrs. Merrick & Son, of Glastonbury, who have preserved as much of the original stone as possible, and the tower again stands cut in its stunted form.—*Western Press.*

BAPTIST CHURCH, WYCOMBE.—A site for a new Baptist church has been secured at the junction of Oakridge and Jubilee-roads. At present effort is concentrated on the first part of the project—the erection of schools and classrooms, to accommodate about 250 persons. The design is by Mr. T. Thurlow, architect, High Wycombe.

CONGREGATIONAL CHURCH, SOUTH CLIFF, LOWESTOFT.—The tender submitted by Mr. John Ashby, Lowestoft, has been accepted for this church, and building operations have been commenced. The contract amounts to 1,698*l*. (architects' estimate amounted to 2,000*l*.). The architects are Messrs. George Baines & R. Palmer Baines, Clement's Inn, Strand, W.C.

FIRE BRIGADE STATION, CARDIFF.—Plans for the new fire station, with living quarters for thirteen officers and firemen with families, and for eleven single members of the brigade, were submitted on the 11th inst. to the Cardiff Watch Committee by Mr. Harpur, Borough Engineer. The buildings are to be erected at the corner of Quay-street and Westgate-street. The cost is estimated at 15,200*l*. The plans were adopted.

RECONSTRUCTION OF THE THEATRE ROYAL, NEWCASTLE-ON-TYNE.—It is announced that the reconstructed Theatre Royal will be opened on Boxing-night. The old theatre was shut, as it were, between shops. The area of the new building has been considerably enlarged, several shops, both in Market-street and Shakespeare-street, being taken for the purpose. The portico, which has dominated Grey-street for over sixty years, has not been interfered with. Beneath this, as before, is the main entrance to the theatre, and from the street inwards great improvements have been made. A stone screen has been built up there, in strong relief against the darker background. The screen is surmounted by two sculptured figures. Here are the entrances to the dress circle and the upper circle, and the emergency exits from the pit and gallery. The vestibule is spacious; it is approached by a lobby, whose walls are lined with rose marble. The entrance-hall has Pavanazza marble pilasters and columns, and there is a marble staircase leading from the hall to the dress circle. There is a polished mahogany dado on the walls of the hall and staircase, the frieze and the ceiling being decorated in fibrous plaster. A retiring saloon is provided, the floor being paved with white marble. The pit and gallery entrances are in Shakespeare-street. Here, too, are the exits from the upper circle and the stalls, as well as the stage-doors and the entrances to the dressing-rooms. All the exit doors are fitted with patent panic bolts, and open outwards. The ways to the different parts of the house are so arranged, the descents particularly, as to prevent the possibility of a crowd accumulating at any given spot. The dressing-rooms are ventilated on the plenum system. Each room is fitted with hot and cold water. The house is divided, as it was before, into pit and stalls, dress circle and upper circle, boxes, amphitheatre, and gallery. All these are built of fireproof material, the floors being concrete, and there is not an upright pillar to be seen anywhere, all the overhanging parts being carried on cantilever girders. The proscenium front is of alabaster and fibrous plaster. The stage is divided from the front of the house by a fireproof curtain. The auditorium will seat 2,500 people. The theatre will be lighted by electricity, and there is an installation of four thousand lights, operated from a switchboard on the stage. The architect of the new building is Mr. Frank Matcham, of London, and the general contractors have been Messrs. J. Parkinson & Sons, Blackpool, Lancashire. The clerk of works has been Mr. C. Greenman. Messrs. Vaughan & Dymond, of Newcastle, have supplied the ironwork; the marble work has been provided by Messrs. J. Tweddle & Co., Newcastle; the system of ventilation has been put in by Messrs. Stott & Co., Oldham; the ornamental work in front of the circles and boxes has been supplied by Messrs. De Jong, London; and the electric installation has been put in by the Alliance Electrical Company, Manchester. The hydrants have been provided by Messrs. Oldroyd & Co., Leeds, and the stage portions of the work by Mr. J. N. Lyons, London, represented by Mr. Mather.

LEEDS SCHOOL OF ART.—Sir James Kitson, M.P., laid the foundation stone of the new school of art in Leeds on the 11th inst. The building will accommodate twice as many pupils as the old school, which, as a Government school of design, was established in 1846. Last year six silver medals and seven bronze medals were won by the students, and the number of successes in design was such as to place the school third in the provinces. The number of individual students was 575. Last year the committee decided to invite competitive designs for a new building, the cost not to exceed 10,000*l*. The design by Messrs. Bedford and Kitson, of Leeds, was selected, on the recommendation of the adjudicator, Mr. W. H. Bidlake, M.A., of Birmingham. The new building will have frontages in Vernon-street, Percival-street, and Cookridge-street. In character the building will be quite plain, but on the west elevation, facing Cookridge-street, provision will be made for a panel, which will be filled in by the students in glass mosaic. In the basement provision will be made for classes in the applied arts, including plaster work, repoussé, enamel, marble and stone carving, wood carving and cabinet work, pottery, painting and decorating, lithography, and bookbinding. On the ground floor there will be a light and shade class-room, a model and freehand class-room, and a lecture-room capable of seating 100 students. The first floor will afford accommodation for a painting class-room, an architectural class-room, a design-room and library, and an elementary modelling-room. On the second floor there will be the life room, antique room, life modelling-room, master's room, and a conservatory for plants to be used in the school.

FIRE STATION, LONDON.—Mr. J. D. Gilbert, Chairman of the Fire Brigade Committee of the London County Council, laid the foundation-stone of the new fire station in Euston-road on the 14th inst. The land cost 7,700*l*., and the contract for building was 14,377*l*. The builders are Messrs. Simpson & Co., and the architect was Mr. W. E. Riley, of the London County Council. The station will be in Portland stone and red brick. There is ample provision for the third officers' quarters, quarters for station officer, seven married men, coachman, and single men, with large recreation-room. Stabling will be erected for six horses, and the engine-room will be 39 ft. by 33 ft., with space for a horsed escape, steam-engine, and hose-cart.

LEEDS TOWN HALL ALTERATIONS: PROPOSED NEW ASSIZE ACCOMMODATION.—At a meeting of the City Buildings Sub-committee on the 16th inst., Mr. Jonathan Peate, the chairman, recommended, as the result of a conference with the City Engineer, the provision of entirely new rooms leading off the corridor of the Town Hall, on which the Grand Jury room opens. The suggestion is to knock down a portion of the blank wall and to roof over the leaded flat as was done when tearooms were added to the Lord Mayor's suite of apartments on the other side of the building. Another point considered was the contemplated rearrangement of the Chief Constable's and the Town Hall Superintendent's offices.

ALTERATIONS TO WOLVERHAMPON TOWN HALL.—The General Purposes Committee of the Wolverhampton Town Council have issued a report with regard to the proposed alterations and additions to the Town Hall buildings. Seven tenders were received, and the Council is recommended to accept that of Messrs. H. Willcock & Co., of Wolverhampton, amounting to 14,550*l*., and request them to tender for the panelling of the council-chamber and the Mayor's reception-room, and the erection of a gallery in the council-chamber. It is also recommended that the Public Works Committee be asked to make proper arrangements for the sittings of the Council in the Sessions Court, for the removal of the pictures in the Council-chamber, and also to make other provision for the carrying on of the business of the Corporation while the alterations to the Town Hall are in progress, and that tenders be invited for the necessary furniture for the Council-chamber and the new and altered offices, and that the special committee, who have charge of the extensions to the Town Hall, be authorised to accept such tender as they may think proper.

NOTTS SANATORIUM FOR CONSUMPTIVES, NEAR MANSFIELD.—The construction of the Nottingham and Notts Sanatorium for Consumptives upon the site on Ratcher Hill, near Mansfield, is rapidly approaching completion. The frontage of the sanatorium faces south-south-east, towards Bildworth. The general plan of the building is a small central block, with wings east and west of it, the over-all measurement being 174 ft. by 69 ft. The building is constructed throughout of wood, with brick foundations and corrugated iron roof, and is designed to accommodate about twenty patients, though provision will only be made at the outset for fourteen, together with a matron, one nurse, and two or three servants. In the central part of the building are located the apartments of the matron, nursing and domestic staff, the private wards, isolation ward,

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bathrooms, and lavatories. The kitchens and other domestic offices are also placed between the wings. The walls of all the rooms in this part of the sanatorium are of Carolina pine match-boarding of double thickness, with layers of felt and air-space between. In the wards compo-boarding has been used for the walls with a view to securing a smooth, washable surface. The two main wards are each 40 ft. by 22 ft., and measure 11 ft. 6 in. from floor to ceiling, providing accommodation, respectively, for six or seven patients of either sex. The sanatorium is lighted throughout by means of electricity, generated in a small electric lighting station on the north side of the building. With the exception of the matron's and nurses' sitting-rooms, the sanatorium is heated throughout by low-pressure hot-water radiators, the boiler-room being in the basement of the central building, and the roofs are fitted with Boyle's air-pump ventilators, surmounted with ornamental turrets. A feature of the sanatorium is the series of verandahs. These run the whole length of the wings on both the north and south sides, the dimensions of each being 67 ft. by 9 ft. They are roofed with glass, but are open at the front and ends, save for a boarded palisading about 3 ft. high. The accommodation of the sanatorium can be increased to a capacity for twenty-six patients by utilising a large attic in the central building, with very slight structural alteration, as a ward. The buildings have been constructed in accordance with designs provided by the Portable Buildings Co., of Manchester and Fleetwood, under the direction of their representative, Mr. Robinson, the superintending architect being Mr. Robert Evans, jun., of Nottingham. The contract for the construction of the foundation, brickwork, and roadmaking has been carried out by Mr. C. Vallance, of Mansfield; the heating apparatus, baths, and ironmongery have been fitted by Messrs. T. Danks & Co., Nottingham; the electric light fittings and generating plant have been put in by Mr. W. J. Furse, Nottingham.—*Nottingham Guardian.*

NEW BUILDINGS, ST. PETER'S HOSPITAL, BRISTOL.—A new boardroom has been opened at St. Peter's Hospital, for the use of the guardians of the Bristol Union. In the course of last year it was decided to erect new buildings at the west end portion of St. Peter's, without interfering with the ancient frontage of the hospital. The architect, Mr. W. S. Skinner, was directed to make no alterations involving the destruction of any part of the building of any antiquarian or architectural interest, and when his plans were submitted it was seen that the retention of the front elevation was secured, and also the existing courtroom and all the rest of the interior which was of any antiquarian interest. At the same time the plans showed a new boardroom of suitable dimensions, and other much-needed accommodation for the guardians, for the staff, and for the poor applying for relief. The nature of this new accommodation on the three floors is as follows:—First floor (same level as existing board-room and clerk's offices), board-room, 40 ft. by 30 ft., with entrance lobby, 23 ft. 6 in. by 8 ft., and long corridor down side; guardians' private room, chairman's room, ladies' cloak-room, gentlemen's cloak-room (and inner room and lavatories also). Ground floor (entrance level), two offices, and one large office, 29 ft. by 21 ft. 6 in. (about to be divided into three). Basement (yard level), large waiting-hall or pay-station, 46 ft. 6 in. by 21 ft. 6 in., with two offices for relieving officers, and lavatories and stairs to ground floor. The new board room is lined throughout to a height of 15 ft. in Austrian oak, designed in the Jacobean style, but of a somewhat later date than the woodwork of the old board room. The frieze and pilasters are carved, and no two panels of the former are of the same design. The ceiling is coved, ribbed, panelled, and enriched in plaster, and has a central lantern light. Electric light is given from six electroliers, each of five lights. The seating accommodation is for sixty-four persons, in addition to which there are five seats on the dais for the chairman, vice-chairman, clerk, &c. Messrs. Stephens, Bastow, & Co., Ltd., of Bristol, were the builders. The cost of the work has been about 7,000*l.*

DUNDEE BUILDING TRADE.—The state of the building trade in Dundee at the present time is not particularly bright, and those in a position to know give as the cause that the city is overbuilt, and that material is still at too high a figure. The valuation roll shows at present something like 2,000 empty houses. During recent months building work has consisted almost entirely of tenements and small buildings, and, with the exception of the prospect of district libraries, there is no contract of importance in view. Builders are looking to the tramway extensions developing feuing. Already, by the opening up of the outlying districts of the city, many small cottages and villas have been built, notably in the Maryfield district, and now that the cars penetrate to Balgay on the one hand and Ferry-road on the other, additional dwellings may be expected to spring up. The laying down of tramways gives rise also to the probability of new streets being formed, and if these should happily result, the building and allied trades may take a turn for the better.—*Dundee Advertiser.*

FOREIGN.

FRANCE.—A monment to Mgr. d'Hulst has been inaugurated in the chapel of the Catholic church in Rue Vaugirard. The bust is by Chaplain, and is placed in a niche decorated with a framework of mosaic designed by M. Daumet.——The ultimate use of the Petit Palais on the Champs Elysées seems still undecided, in spite of the resolution which had consigned it to the Municipality of Paris as an Art-Museum, but which has not been formally ratified. Meantime the work for the efficient warming of the building is being carried on, at the respectable cost of 108,000 francs; and a great deal more is to be spent on interior decoration. —— M. Ferrary, sculptor, has been appointed professor of modelling at the Ecole des Beaux-Arts, in place of the late M. Massoule.——A committee has been formed to erect in the Parc Monceau a monument to Pailleron, the brilliant author "Le Monde où l'on s'ennuie."——A splendid tapestry executed at the Gobelins, after the "Danse des Nymphes" of Coypel, is to be placed as a decoration in the large Conseil of State gallery at the Palais Royal.——M. Paul Dubois has just completed a fine equestrian statue of the Republican general Marceau. —— It is proposed to close the quadrant galleries of the Trocadéro at Paris, in order to enlarge the sculpture gallery, which has become insufficient for its requirements.——The Victor Hugo monument, by M. Barrias, is to be unveiled in the Place Victor Hugo on February 26, the anniversary of the poet's birth.——The painter Weerts has just completed a large picture, 20 mètres long by 5 in height, for the gallery of the Cour d'honneur of the Sorbonne. It represents a Fair at St. Denis in the XVth century.——The engineer of the Department of l'Ain has been commissioned to construct a bridge over the Saône at Feans, at a cost of 300,000 francs. ——On Friday last the Chamber of Deputies passed, without discussion, the new law which gives to architects and to decorative sculptors a copyright in their works on the same basis as artistic and literary copyright generally.——The Municipal Council of Paris has decided that the Ecole Speciale de l'Architecture, the present building of which is to be soon demolished, is to be rebuilt on the line of the Boulevard Raspail, on a site near the Mont-Parnasse cemetery.——The Conseil-Général of the Seine has voted for the reconstruction of the two suspension bridges of the Ile Saint-Denis, at a cost of about 2,000,000 fr.——There is to be an International exhibition of arts and industries at Lille next year, from May to September. It will be installed on the space at Lille called the Champ de Mars, and is to be on a large scale, occupying an area of 150,000 square mètres.—M. Albert Besnard has been appointed president of the "Objets d'Art" section of the new Salon, in place of the late M. Cazin.——Important artistic work is shortly to be carried out in the Department of the Seine, for the decoration of the Hôtel-de-ville of Ivry-sur-Seine and that of Neuilly; and also for the decoration of the Mairies of Choisy-le-Roi, Clichy, and Thiais.

MISCELLANEOUS.

THE CHRISTMAS HOLIDAYS. — Next week the *Builder* will be published on Tuesday, the 24th inst., and to ensure attention all communications for the editor must reach our office by Monday morning, the 23rd.

LEICESTER MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Leicester Master Builders' Association took place on the 11th inst., Mr. Edwin Fox presiding. The Chairman having proposed the loyal toasts, Mr. H. J. Grace proposed "Success to the National Federation of Building Trades Employers, and of the Midland Centre." He was, he said, one of those who believed in workmen's unions; he thought they might be made to do a great deal of good. He would not say they might not do harm, but if they did so, it was not the fault of the union, but of those who did not use their power or control over the men in the way that it ought to be used. He had heard it said sometimes that these workmen's unions tyrannised. That might be so, but that was the fault of the officers of the union. He did not think it was the fault of the men, for he had always found the men agreeable to meet their employers in a conciliatory spirit. The men had been organised in the past better than the masters. It remained for the masters to organise and hold well together, and by so doing he was sure they would avoid any serious disputes.—Mr. Arthur Chambers, President of the Midland Centre, responded. He said it was true that they had only been reorganised for a short time, but it was twenty-one years since the National Association of Master Builders came into existence. During the last twelve months they had altered the name from the Master Builders' Association to the National Building Trades Employers' Federation, which covered rather a larger ground than the former title. It was felt that the Association, representing one of the most important trades in the country, should not only embrace one section of the trade, but that it should embody the whole of them. It was very necessary in times of any difficulty that all the combined trades should put their shoulders to the wheel and work together, rather than they should act as units, and simply have to stand upon the strength of their own federation. He quite recognised the fact that the men had as much right to organise as the masters, and he thought that the only way to bring matters in dispute to a satisfactory settlement was for both sides to meet on an equal footing, and discuss the matter in all its bearings. The National Federation was not an aggressive body, but was formed simply to protect the interests of the building trade. —Mr. A. S. Smith (President of the Birmingham Association) proposed "The Leicester Master Builders' Association." The present system of trades unionism was one which encouraged the worthless, and which compelled the worthy to do as little work as possible for their money. It behoved the builders to stand shoulder to shoulder, and resist to the uttermost this system, which was becoming a very real peril to the trade and commerce of their land.—Mr. Edwin Fox, President of the Leicester Association, responded. He said that he was happy to say that they had now no dispute whatever with their operatives. They had one at the beginning of the year in regard to the demarcation of work at the Halford-street market. Sir William Markby, the arbitrator, laid it down that a builder had a right to say whether a navvy should mix concrete or not, and it was the first time he had known a builder allowed to decide anything except paying wages on Saturday. Afterwards the masters and men had a conference with regard to other points, and he was glad to say that they came to an amicable conclusion. There were some of the best men in the world among the labouring classes—diamonds in the rough. The fault, he thought, was that although the working-classes were taught to read and write, they were not taught to think. In reference to the "go easy" principle of only laying so many bricks per day, the speaker said he thought it was their duty to do away with it once for all. They could do it if they were all united, and were determined to get a fair day's work for a fair day's pay. There was not a bricklayer or a union in the country which could say them nay. Mr. Hardington proposed "The Architects and Surveyors," and Mr. Poynor responded. Mr. Brown (Derby) proposed "The Town and Trade of Leicester," and Mr. O. Wright responded. The last toast was "The Visitors," proposed by Mr. D. Garrett, and responded to by Mr. Smith (Nuneaton).

LONDON MARKETS.—In August last the London County Council withdrew their Bill, which had been passed by the House of Commons, for the acquisition of Spitalfields Market. At their meeting on December 12, the Court of Common Council of the City of London ratified their agreement to purchase the freehold and leasehold interests in the market and its site, for 176,750*l.*, from the vendors. The market, it is stated, had been let to Mr. Robert Horner upon an eighty-four years' lease from 1882 at a rent of 5,000*l.* per annum. The Court also resolved to offer facilities to a party of Russian agriculturists, who have arrived in London, for inspecting the Central Meat and Provisions Markets at Smithfield, and the Cattle Market at Islington.

LEICESTER-SQUARE.—We read that the premises lately vacated by the Dental Hospital, on the southern side of the square, have been acquired at a cost of about 28,000*l.*, which includes the freehold, by the National Society for the Prevention of Cruelty to Children, who still need a sum of 18,000*l.* to enable them to establish their chief offices there unencumbered by liabilities.

SALE OF BOOKS ON ARCHITECTURAL SUBJECTS.—The sale of rare books and manuscripts at the rooms of Messrs. Sotheby, Wilkinson, & Hodge, Wellington-street, Strand, on December 11 and 12, included a number of works on architecture. The following prices were realised:—"The Arts Connected with Architecture in Central Italy," by J. B. Waring, 1858, 2*l.*; "Memorials of English Mediæval Churches, with an Introductory Essay on Ancient Ecclesiastical Architecture," by Charles Wickes, 1857, 7s.; "Architectural and other Designs, Studies of Trees, &c.," by James Thompson, architect, thirty-eight original drawings, 10s.; John Stow's "Survey of London," enlarged by Anthony Munday and Henry Dyson, 1633, 1*l.* 10s.; "Architectural Sketches from the Continent," 100 plates, by R. N. Shaw, architect, 1858, 6s.; Serons d'Agincourt's "History of Art by its Monuments," translated, 1847, and "Ancient Wood and Iron Work in Cambridge," by Redfarn and Clark, 1886, 10s.; "The Decorations of the Garden Pavilion in the Grounds of Buckingham Palace," by L. Gruner, 1846, 5s.; "Architectural Antiquities of Normandy," by J. S. Cotman, with historical and descriptive notes by Dawson Turner, 1822, 10s.; "Remarks on the Domestic Architecture of France (Charles V. to Louis XII.)," by Henry Clutton, architect, 1853, 6s.; "Ancient Architecture of England," by John Carter, enlarged, with notes, &c., by John Britton, 1837, 17s.; the *Builder*, Vols. XLVI. to LXXVII., 1884-99, 4*l.* 4s.; "Sculptured Stones of Scotland," edited by John Stuart (Spalding Club), numerous finely-executed plates, Aberdeen, 1856-67, 10*l.*; "British Archaic Sculpturings of Cups, Circles, &c., upon Stones and Rocks," by Sir J. Y. Simpson, Edinburgh, 1867, and Dean Stubbs's "Historical Memoirs of Ely Cathedral," 1897, 8s.; A. W. Pugin's "Contracts: A Parallel," 1841, "True Principles of Pointed or Christian Architecture," 1841, "Apology

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for the Revival of Christian Architecture in England," 1843, and "Chancel Screens and Rood Lofts," 1851, all bound in one volume, *1l.* 16s.; "Ancient and Modern Architecture," by J. Gailhabaud, 1844-6, 16s.; "Examples of Ancient Domestic Architecture," by F. F. Dollman and J. R. Jobbins, 1858-63, *1l.* 13s.; "Collectanea Archæologica: Communications made to the British Archæological Association," two volumes, 1862, *1l.* 6s.; "Historical and Descriptive Accounts of the Theatres of London," by E. W. Brayley, with plates by D. Havell, 1826, *1l.* 18s.; Detached Essays and Illustrations, published by the Architectural Publication Society, 1848-52, and "Dictionary of Architecture," complete, eight volumes in five, *9l.* 10s.; "Sculptured Monuments in Iona and the West Highlands," by James Drummond, Edinburgh, 1881, *2l.* 4s.; "Westminster Abbey: Its History, Antiquities, and Monuments," by R. Ackermann, 1812, *3l.* 3s.; "Dictionnaire Raisonné de l'Architecture Française du XI. au XVI. Siecles," by Viollet-le-Duc, 10 vols., 1858-68, *11l.* 5s.; "Brick and Marble in the Middle Ages: Notes of a Tour in the North of Italy," by G. E. Street, 1855, 8s.; "The Ecclesiastical Architecture of Ireland, anterior to the Anglo-Norman Invasion, comprising an Essay on the Origin and Uses of the Round Towers of Ireland," by George Petrie, 1845, *1l.* 17s.; "Remarks on Church Architecture," by J. L. Petit, 2 vols., 1841, "Dictionary of the Fine Arts," by J. Elmes, 1826, and "Canova on the Elgin Marbles," 1816, 17s.; "The Ecclesiastical Architecture of Scotland, from the Earliest Christian Times to the Seventeenth Century," by D. Macgibbon and T. Ross, Edinburgh, 1896, *3l.* 9s.; "The Dolmens of Ireland: their Distribution, Structural Characteristics, and Affinities in Other Countries," by W. C. Borlase, 3 vols., with 4 maps and 800 illustrations, 1897, *2l.* 2s.

EDINBURGH AND LEITH MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Edinburgh and Leith Master Builders' Association was held on the 13th inst. in the Royal British Hotel, Edinburgh. About 120 gentlemen were present and Mr. Robert Lamb (president) occupied the chair. After the toast of "The King, Queen, and Royal Family" had been duly honoured, Mr. Lownie gave "The Imperial Forces," and Bailie Cameron replied. The Chairman proposed "The Lord Provost, Magistrates, and Town Councils of Edinburgh and Leith." Provost Mackie, Leith, in replying for the Leith Corporation, alluded to the friendly relations that existed between the two Corporations. Bailie Telfer replied on behalf of the Edinburgh Corporation. The toast of "The Edinburgh and Leith Master Builders' Association" was proposed by Mr. M'Arthy, who spoke of the good work the Association had done. He alluded to the proposal for a national federation of employers' associations and trades-unions to cement between employers and employed the feeling of common interest; and stated that if such a proposal could be carried through, he believed it would be one of the best things that could be accomplished. Councillor Forrest replied, and expressed himself in favour of national union. He was opposed to Town Councils, County Councils, and School Boards doing their own work. "The Scottish Building Trades Federation" was given by Mr. Thomas Lamb, and Mr. Alexander Drysdale replied. Other toasts followed.

ARCHÆOLOGICAL DISCOVERY.—While workmen were engaged near Falkirk, they came upon what will probably prove one of the most interesting relics of the Roman occupation of the Stirling district. It is a large stone about 10 in. broad, 10 in. thick, over 4 ft. high, and weighing probably half-a-ton. It is beautifully sculptured in high relief; the ornamentation is divided into two panels, the larger one being at the top. These panels are separated by a band about 1½ in. broad, which also is carried round both panels, meeting in an angle at the top of the stone. Under the angle is a beautiful shell-like device, delicately executed. The upper panel is completely filled by a horse and rider, the latter carrying a sword triumphantly aloft. He is arrayed in full armour, and bears a shield. The lower panel represents a naked man, a wild Celt presumably, in a fallen condition, his shield and weapon lying beside him. The profile is perfect, and the stone is in a complete state of preservation. It was found buried about 5 ft. below the surface of the ground, and it seems as if it had been so placed almost immediately after it had been sculptured. It is certainly a very fine specimen of the Roman sculptor's art, and its history will be closely investigated. Meantime, the relic has been taken possession of by Mr. Gair, Procurator Fiscal, on behalf of the Crown authorities.—*Standard.*

BRITISH FIRE PREVENTION COMMITTEE. — The executive of the British Fire Prevention Committee have arranged to test in January next a large timber floor by Millar's Karri and Jarrah Wood Co., which is to show the fire resistance of these Australian hardwoods compared with iron and concrete—a subject of the utmost interest to the great dock companies. The attendance of several distinguished foreign experts is anticipated. There will also be some door tests in Karri and Jarrah wood. We understand that among other tests to be expected early next year are tests by the Electric Timber Seasoning Co. with treated wood; and by the British Uralite Co. with fire-resisting slabs.

CAPITAL AND LABOUR.

DISPUTE BETWEEN JOINERS AND SHIPWRIGHTS, BARROW-IN-FURNESS. — In compliance with the request of the arbitrators appointed by the Joint Secretaries of the Master Builders' Association and the Joiners' Society, Barrow-in-Furness, Mr. James W. Little agreed to act as umpire to consider whether Messrs. Gradwell & Co. should employ shipwrights and handymen, or joiners, to do the work connected with the repairs to the wharf at Ramsden Dock. The arbitrators appointed by both parties to the dispute came to the unanimous decision that the joiners had failed to make out a case for their exclusive employment on the work under consideration. There was, however, a slight difference of opinion in the wording of the award, as drawn up by the respective arbitrators, and consequently it becomes necessary for the umpire to give the final decision, which was as follows, viz.:—That, in accordance with local custom and precedent, and the general practice in other parts of the country where similar work has been performed, Messrs. Gradwell & Co., Limited, are at liberty to employ shipwrights and handymen and joiners to do the work connected with the repairs to the wharf at Ramsden Dock, and that the work does not devolve exclusively on the joiners.

CO-OPERATIVE BUILDING AND JOINERY WORKS.—The December report of the Amalgamated Society of Carpenters and Joiners contains the announcement that the great majority of the 68,000 members have voted in favour of the establishment of co-operative building and joinery works. When this proposal was first mooted it received, it is stated, but scant support, but the educational influences of recent events—not the least of which are the charges put forward that the organised workers in the building trades are the principal offenders in "go easy" methods—has had its effect. The report also contains the statement that the carpenters and joiners have joined the Labour Representation Committee, and are prepared to aid in every legitimate manner the securing of the direct representation of wage-earners not only in Parliament, but also on all public bodies.

LEGAL.

DISPUTE BETWEEN THE CORPORATION OF WESTMINSTER AND THE LONDON COUNTY COUNCIL.

THE case of the Mayor, &c., of Westminster *v.* the London County Council came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Darling and Channell on the 16th inst., upon a special case stated raising the question whether the County Council or the Corporation of Westminster was the proper authority to lay down conditions for construction, and to sanction the construction of wooden structures for the accommodation of spectators at public functions taking place within the area of the City of Westminster. The question arose originally out of the structures erected to accommodate spectators at the funeral of the late Queen, and the opening of Parliament by his Majesty the King on February 14; but the question also applied to the forthcoming opening of Parliament and the Coronation procession in June next. The City of Westminster claimed that, under the London Government Act of 1899 the administration of this matter within their area was handed over to them, inasmuch as the structures were wooden structures within Section 84 of the London Building Act, 1894. This section of the Act, the powers under which formerly vested in the County Council, were specifically handed over to the Corporation of Westminster, applied to the erection of special and temporary buildings and wooden structures, and provided that no person should set up any wooden structure except hoardings enclosing vacant land, exceeding 12 ft. in height, without having first obtained for that purpose a licence, which must contain conditions as to the nature of the structure, the time for which it was to be permitted to continue, and the place at which it was to be erected. The County Council contended, on the other hand, that the structures in question did not come under that Section, but under Sections 82 and 83, which also applied to temporary buildings, &c. The case found that the structures now in question, and which were erected in February last, were constructed of wood, except the nails and some of the other fastenings of the cloth or other hangings placed upon them, and that they were of a temporary character. The case also stated that questions having arisen between the two public bodies as to which was the proper authority to act under the London Building Act, the Court was asked to say which was the body (1) to control, approve, or license the structures referred to, and (2) to take proceedings against the persons who had without licensed permission or approval, erected them. The Court was also asked to say further whether such structures were or were not subject to the supervision or inspection of the District Surveyor under the Act.

Mr. Manisty, K.C., and Mr. Craies appeared for the Corporation of Westminster; and Mr. Horace Avory, K.C., and Mr. Daldy represented the County Council.

Mr. Manisty argued that upon the proper construction of the Acts his clients had had the power of dealing with these structures transferred to them.

Mr. Avory said the only desire of the two bodies was to obtain a decision in order that they might exercise their duties under the different sections and avoid a conflict of jurisdiction. He suggested that the only way to reconcile these sections and make them work harmoniously was to hold that Section 84 of the Building Act applied to structures like bicycle and other sheds which were put up at the back or front of a house, which were not temporary in the sense of being put up and taken down in a week or so, but which were to last for several years.

In the result, the Lord Chief Justice in giving judgment said it was quite impossible to deal with every case that might arise. The question here had reference to a number of structures made wholly, except in regard to the nails, of wood, and he wished to guard himself against being misunderstood as laying down any rule which might govern some special case, which might give rise to other considerations. In his opinion, the broad question of whether the County Council or the Corporation was the proper Authority to lay down conditions and to sanction the construction of wooden structures which might have to be erected on the occasion of public functions in the City of Westminster, should be decided in favour of the Corporation of the City of Westminster. The Court did not propose to answer the third question as to the supervision of the District Surveyor, as to do so would, they thought, lead to difficulties. The Court, however, thought that the Corporation of Westminster was the Authority which had the right to exercise the powers of Section 84 of the Building Act.

The other judges concurred.

A WOLVERHAMPTON ARCHITECT AND HIS FEES.

AT the Wolverhampton County-court a few days ago before Judge H. Roberts, Mr. Charles Henry Martin, architect, of Wolverhampton, sued Mr. George Head, a publican, of Horseley Fields, for the sum of 41*l.* 18s., as his commission for the preparation of plans, specifications, &c., for the erection of a house.

Mr. T. Dallow was the solicitor for the plaintiff, and Mr. Tildesley appeared for the defendant.

The evidence of the plaintiff was to the effect that on May 26 the defendant called upon him and stated that he wanted him to prepare plans for the erection of a villa-residence. Nothing was said at the interview as to what the house was to cost, and plaintiff, with the assistance of his son, set to work and prepared the plans. These were submitted to and approved by the defendant, and by his instructions the specifications were prepared, estimates of quantities got out, and tenders invited.

The lowest tender sent in was 687*l.* 10s. This, the defendant said, was more than he wished to expend, and he desired that the plans should be reduced so as to bring the cost of the house within 400*l.* This was done by excluding several items in the plans. Tenders were again invited, and one was sent in for 417*l.* 10s. The defendant said he would not go beyond 350*l.* Other alterations were made in the plans to reduce the cost, but ultimately the defendant declined to proceed with the plans prepared by the plaintiff, and had his house erected by another builder. In September the plaintiff had an interview with the defendant, and it was suggested that he should receive 20*l.* as remuneration. He refused. In the account sent in he charged 2½ per cent. on the lost building for the preparing of the plans, 2½ per cent. for getting out the quantities for the builders, 8*l.* 10s. for altering the original plans, and 1*l.* 1s. for sketch copy for the District Council. The house not having been built from his plans, he deducted ½ per cent.

In cross-examination plaintiff denied that he told defendant that his charge would only amount to 2½ per cent. on the total cost of the building.

Mr. F. T. Beck, architect, said he had carefully examined the plans and specifications prepared by the plaintiff. He considered the charges fair and reasonable, and such as were the recognised charges in the profession.

The defence was that the plaintiff exceeded his instructions by drawing out plans of a more elaborate character than was intended.

Defendant, on being put into the box, denied that any plans were shown him until the first batch of tenders arrived.

After further evidence his Honour awarded judgment in favour of the plaintiff for the sum of 40*l.* 10s., at the same time expressing the opinion that the statement made by the defendant that he was never shown any plans until after the tenders were sent in was not accurate.

RECENT PATENTS

ABSTRACTS OF PATENTED INVENTIONS

14,774.—A DOOR-CHECK: *Russell & Erwin Manufacturing Co.*—The check, which is particularly intended for swing doors, has a piston-rod, at the end of which is a plate having a V-shaped groove for

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the pin of a crank upon a rod which is joined to the frame of the door. When the door is being opened the crank draws out the piston, which will in turn retard the motion of the door when it is being closed. One end of the rod that joins the door and the crank shaft has a stud that moves in a slotted plate beneath the woodwork above the door, and the other end of the rod is clamped on to the shaft.

14,778.—AN ARTIFICIAL COMPOUND FOR BRICKS, STONE, &C.: *A. H. Croizier and A. E. Thomine.*—The bricks, tiles, cornices, mouldings, and other objects are fashioned under pressure of a compound of slaked lime, sand, loam, or clay, or it may be of clay and lime only, and for the sand may be used blast-furnace or similar slag. The moulded articles are exposed to steam at a high pressure in a closed vessel.

14,781.—AN APPLIANCE FOR INCANDESCENT GAS-BURNERS: *W. Kraetke.*—In order that the self-igniter may not be damaged by the flame and be readily removed, the pellet is mounted centrically on a detachable fitting, which has a peg for the socket in the head of the burner, and arms that carry the mantle-rod socket and a perforated plate.

14,822.—APPARATUS FOR EXCAVATION PURPOSES: *W. Taylor and W. S. Hubbard* (*Taylor & Hubbard*).—Side-frames join the bucket to pins upon two levers, the levers being rigidly secured to a shaft carried by bearings in plates upon the jib, and between them is fastened a third lever, which a girder connects to the arm of a pivoted quadrant in gear with a worm. Of the gear-wheels that serve for the working of the worm from the crank-shaft of the engine, the last bevel-wheel is geared to two bevel-wheels loose upon the shaft, whereof either can be fastened to the shaft with a double-sliding friction one. A friction-cone helps to control the position of the bucket in respect of the soil.

14,827.—A VICE: *C. Rauhe.*—One leg or both legs are pivoted on to a bar which has an extension that can be fastened upon a table. The legs have jaws and are adjusted with a screw; they have also fittings that will serve for pressing, shearing, punching, and similar operations. The distance between the legs can be varied by joining one of them adjustably to the bar.

14,847. — CONSTRUCTION OF ROOFS, WALLS, FLOORS, &C.: *F. H. Turner.*—Blocks of terra-cotta or fire-clay are fashioned with flat recessed, flanged bottoms, convexed tops, partitions, and side-ribs to be laid upon the girder flanges. There are openings between the ribs through which fine concrete may be filled in, and until concrete has been run in the terra-cotta tubes are held in position with distance-blocks of iron, wood, or fire-clay. The girders may have triple flanges. Ribs may be attached to the webs below the neutral axis or central line.

14,938.—PROCESS OF MOULDING BLOCKS, TILES, &C.: *P. Wernicke.*—A shapened box having a sieve bottom feeds the material into the mould, where it is stirred with the wires of a frame hung upon a rod, excess of material being fed to the edges or elsewhere for blocks with thick edges, &c., by means of the spacing of the wires. After the mould has been filled the bottom of the box is closed by the lowering of the wires between those of the sieve. In another form of grating the mould can be directly filled.

14,940.—AN ATTACHMENT FOR HATCHETS: *G. M. Fennell.*—The handle, the head, and the blade are formed of sheet metal and are brazed or rivetted together, and the blade may be caused to abut against the end of the head, which may be made in one piece with the blade; the upper end of the handle is shaped so as to constitute a wedged part of the tool.

14,976.—AN ANTI-CORROSIVE PREPARATION: *J. J. Johnstone.*—A preparation for the prevention and removal of corrosion and incrustation is made of an admixture of eucalyptus leaves, creosote, and chloride of ammonia, for use in liquid or pulverised form in the parts of—eucalyptus leaves, 330 lbs.; creosote, 1 oz.; and chloride of ammonia, 130 lbs., mixed with water, 1,100 gals.

15,001.—AN ELECRICITY CURRENT METER: *A. Honig.*—The axle of a continuous current am-meter or volt-meter carries a pointer and a ring-shaped permanent magnet, at one side of which is a small air gap in which are set fixed circuit conductors in order that the magnet-poles shall move across them with the turning of the axle; a portion of a wire coil wound in a former having a flat part in the gap constitutes the conductors. For large current an am-meter has a conducting-strip (in place of a coil) of which the part near the axle is turned into a vertical plane; the interposition of an insulator provides for the shunting of the strip by the main conductor, and any scale required can be produced by a variation of the thickness of the coil or conducting-strip in the air-gap. The former of a portable intrument wherein a pressure-measuring coil is wound will conduct the current that is to be computed, or a current-supporting strip can be adopted for the pressure coil.

15,012.—A LIFT VALVE: *W. R. Skinner and A. Owen.*—The valve is adapted for a high-pressure service and for steam and water service. An enlarged cone is fashioned at the upper end of the valve-spindle with a seat in the casing upon which it is forced with nuts upon the spindle, a recess in the cone takes the squared end of the lower and screwed portion of the spindle, and a hand-wheel works the valve; a cone-shaped seat in the casing fits against a corresponding ring upon the removable seating, which a ferrule that is screwed into a notched ring in a recess in the casing maintains in its proper position. For a small valve an internally-screwed portion of the casing will take the ferrule.

15,021. — ELECTRODES FOR ARC LAMPS: *V. Alexandroff.*—To save the expenditure of energy with the employment of pure carbons the inventor makes a compound of carbon and oxides or salts of magnesium, zinc, aluminium, silver, copper, cerium, thorium, zirconium, calcium, yttrium, or other suitable metals, and mixes a paste of asphaltum dissolved in turpentine, finely pulverised coke, sixty-three parts; graphite, thirty parts; lampblack, seven parts; and magnesia, one part; which he presses into rods that are rendered dense enough by alternately baking them and moistening them with a solution of sugar.

15,035.—MANUFACTURE OF BRICKS: *J. Thompson.*—The material consists of about two parts of clay dust mixed in a dry state with three parts of riddled sawdust; it is then wetted in a pug-mill. The dried bricks are slowly burned in a kiln until the sawdust has been consumed. The inventor claims that the articles are fire and sound proof, and available for being nailed or plastered, for partitions and party-walls, and for a substitute for timber in building construction.

15,057.—A SHED FOR PURPOSES OF SAFETY: *G. A. Nahnsen.*—The sheds, which are devised for use in the manufacture or storage of explosive substances, are built above cellars that have inclined floors and double walls, and are divided into vaulted compartments. In order to lessen damage that may be caused by an explosion, the cellars are charged with water, ashes, infusorial earth, or other suitable materials.

15,074—A TOOL FOR USE IN SUBMARINE OPERATIONS: *B. H. Coffey.*—Rocks under water are broken by the fall of a weighted chisel through an air-chamber. Spuds and anchors hold the floating stage in which is an opening for the air-chamber that is moved about its vertical axis by means of a separated engine. The air-chamber is open at its base and closed at its top, and is fitted with guides for the heavy weight to which the chisel is keyed. A rod connects the weight to a cross-head that slides in vertical guides upon the derrick, and is lifted or lowered with a chain and drum worked from the engines. The ends of pivoted arms extending from the chamber may be hooked on to the cross-head for the lowering or lifting of the chamber when the fixing-clamp has been opened. In a variant form there are projections from the top of the weight which will engage with jaws upon a spring-regulated catch joined to the rod. A wedge automatically liberates the catch, whereby the weighted chisel will freely fall as the catch rises to the top of the air-chamber.

15,095. — ELECTRICAL CURRENT METERS: *A. Wright and Reason Manufacturing Co.*—In order to obtain powerful action, a demand indicator, worked with electro-magnetism, has a large amount of iron in its composition, whilst the residual magnetism may for practical purposes be neglected. In one form of the meter the coil that conveys the current has two iron coils (one of which is fixed) having end arms; the other coil can be turned upon its axis by magnetical repulsion between the arms and has a fast and loose pointer which traverse a scale, the latter pointer being moved by a projection from the other one and resting at the point of highest deflection. The motion of the movable core may be retarded with a vane dipped into glycerine, and a separate maximum pointer may be discarded for the engagement of a ratchet-wheel mounted upon the movable core with a pawl which will obviate the reversal of motion. Confer also No. 18,371 of 1897.

15,123.—APPLIANCES FOR ARC-LAMPS: *Nettlefolds, Ltd., and W. E. Symons.*—The top plate of a solenoid lamp carries a differentially-wound solenoid together with iron tubes at the sides which support an insulated and lower carbon-holder; an iron core of which the iron arms are guided by the side-tubes sustains the upper carbon-holder, whilst interposed copper gauze or iron tubes cased with brass or copper will prevent an actual contact. A flexible conductor establishes connexion with the upper carbon-holder.

15,132.—A WRENCH FOR WORKMEN'S USE: *W. King.*—In order that the disc shall not be turned backwards whilst a loose nut is being screwed up the inventor fashions the disc of a ratchet wrench with an extension upon each side of the head and with milled heads; the disc is either pressed upon by hand or pressed against the work.

15,136.—APPLIANCES FOR HOISTS AND ELEVATORS: *C. Wüst.*—A motor which is affixed to the cage works an electrically-driven hoist or elevator, being geared with drums that wind and unwind the lifting ropes, which pass to the upper end of the well. In a modified shape there are weights which counterbalance the weight of the cage and portion of its load, and drums upon the shafts serve for the winding and unwinding of ropes that are attached to the bottom of the well.

15,186.—DOMESTIC WATER-SUPPLY: *M. M. Brophy.*—A single nozzle is made to supply both hot and cold water, the hot water being provided by admitting steam into the cold water. In order to prevent the parts adjacent to the nozzle from becoming hot, the inventor contrives that steam shall pass to the water-heater and water into the encompassing vessel, and fits rods (formed of two parts with overlapping ends clamped together) and cocks for regulating the flow of the steam and the water; a flanged pipe joins the containing-vessel to the nozzle, which has a T-shaped chamber into which the rods are inserted. The rods are fastened to crank-pins upon discs within the chamber, and of the handles that turn them one is caused to overlap the other, whereby the water-cock will be opened together with the steam-cock. Confer also Nos. 12,163 of 1899 and 15,187 and 21,647 of 1900.

MEETINGS.

FRIDAY, DECEMBER 20.

Architectural Association Discussion Section.—Mr. Howard Humphreys on "The Manufacture, Testing, and Uses of Portland Cement." 7.30 p.m.

Institution of Mechanical Engineers.—Mr. W. Campbell, B.Sc., on "The Microscopical Examination of the Alloys of Copper and Tin." 8 p.m.

Institution of Civil Engineers (*Students' Meeting*).—Mr. A. M. Morgan on "Transmission Dynamometers." 8 p.m.

Glasgow Architectural Craftsmen's Society.—"Tiles: (*a*) Mr. W. G. Peddie on "Wall and Floor Tiles"; (*b*) Mr. J. M'Kim on "Substitutes for Tiles." 8 p.m.

WEDNESDAY, JANUARY 1.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

FRIDAY, JANUARY 3.

Architectural Association. — Mr. J. A. Gotch on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century," illustrated by lantern views. 7.30 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 6.—By E. GANDY (at Northwich).

Lostock Gralam, Cheshire.—Park Farm, 119 a. 2 r. 21 p., f.	£6,000
Hall Field, &c., 28 a. 1 r. 35 p., f.	1,275

By HENRY MANLEY & SON (at Whitchurch).

Iscoyd, Flint.—Two freehold houses and 17 a. 3 r. 12 p.	1,875
A freehold holding, 6 a. 2 r. 28 p.	480
Various enclosures, 50 a. 2 r. 37 p., f.	2,000
Pen-y-Bryn Farm, 82 a. 0 r. 29 p., f.	3,200
The Bank Farm, 58 a. 1 r. 4 p., f.	2,225
Penley, Flint.—Three enclosures, 14 a. 1 r. 22 p., f.	195

By EASTMAN BROS.

Norwood.—59 to 79 (odd), Penge-rd., u.t. 65¼ yrs., g.r. 83*l.*, r. 428*l.* (in lots)	4,665

By KROENIG & Co.

Hendon.—Stratford-rd., Laurel and Lilac Cottages, u.t. 80 yrs., g.r. 9*l.*, r. 80*l.* 12s.	590
Sunningfields-rd., Brooklyn, u.t. 77½ yrs., g.r. 10*l.* 10s., r. 63*l.*	580

By MOORE, SMALLMAN, & Co.

Holloway.—39, Girdlestone-rd., area 920 ft., f., r. 52*l.*	700
Brixton.—Brighton-ter., i.g.r. 36*l.*, u.t. 9 yrs., g.r. nil	265

By D. SMITH, SON, & OAKLEY.

Hornsey.—Middle-lane, f.g.r., 39*l.*, reversion in 78 yrs.	1,055
Highgate.—Cromwell-pl., f.g.r. 10*l.* 10s., reversion in 79 yrs.	285
Cromwell-avenue, f.g.r.'s 30*l.*, reversion in 79 yrs.	830

December 9.—By PERCIVAL HODSON.

Hoxton.—130 to 138 (even), Hoxton-st., u.t. 60 yrs., g.r. 40*l.*, r. 287*l.* 10s.	3,395
Stamford Hill.—135, 137, and 139, High-rd., u.t. 76 yrs., g.r. 30*l.*, r. 104*l.*	900

By MAY & ROWDEN.

Notting Hill.—18, 20, and 24, St. Charles'-sq., u.t. 71 yrs., g.r. 25*l.* 10s., r. 273*l.*	1,495

December 10.—By MUSKETT & SONS.

Wood Green.—1 to 4, King's-rd., u.t. 64½ yrs., g.r. 10*l.*	650

December 11.—By COLES & Co.

Bayswater.—84, Queen's-rd., u.t. 46½ yrs., g.r. 10*l.*, r. 150*l.*	2,180
Bowes Park.—29 and 31, Whittington-rd., u.t. 77 yrs., g.r. 14*l.* 14s., r. 65*l.*	610
Oxford-st.—1, Hanway-pl., u.t. 40 yrs., g.r. 5*l.*, r. 60*l.*	613

By G. HERBERT-BURNS.

Dalston.—80, Greenwood-rd., u.t. 48½ yrs., g.r. 6*l.* 10s., r. 42*l.*	360

By G. PEARCE & SONS.

Manor Park.—35, Sheridan-rd., u.t. 96 yrs., g.r. 4*l.* 10s., e.r. 28*l.*	800

By GODFREY C. LAMBERT (at Croydon).

Croydon.—33, 35, 37, and 39, Parsons Mead, f., r. 107*l.* 10s.	1,470
Parsons Mead, f.g.r. 4*l.*, reversion in 44½ yrs.	114
14 and 15, Wandle-rd., f., r. 76*l.* 18s.	900

December 12.—By DOLMAN & PEARCE.

Chelsea.—96, Oakley-st., u.t. 65 yrs., g.r. 10*l.* 10s., r. 70*l.*	800

By MOSS & GRAY.

Old Ford.—152B, Roman-rd., u.t. 42½ yrs., g.r. 6*l.*, r. 42*l.*	385
Bromley-by-Bow.—2, Box-st., and 1, 3, and 5, Eastward-st., u.t. 63 yrs., g.r. 6*l.*	320
13, 15, and 17, Eastward-st., u.t. 61½ yrs., g.r. 10*l.* 10s.	190
Poplar.—2, Flint-st., u.t. 61 yrs., g.r. 3*l.*, r. 32*l.*	295
113, Brunswick-rd., u.t. 38 yrs., g.r. 3*l.* 10s.	210

By C. C. & T. MOORE.

Bishopsgate.—11, 12, and 12½, Artillery-passage, f.	1,810
Whitechapel.—64, Great Prescott-st., f., r. 100*l.*	1,700
Bermondsey.—29 and 31, Webster-rd., u.t. 44½ yrs., g.r. 10*l.*	530
Stratford.—12 and 13, Forest-lane, and 2A, Maryland Pk., u.t. 87 yrs., g.r. 2*l.*	1,250
Bermondsey.—Virginia-row, f.g.r. 16*l.* 5s., reversion in 94 yrs.	855

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By SIM & RANDALL.

Old Ford.—433, 435, and 437, Old Ford-rd., and 1, Autumn-st., f., r. 104*l.* £990
13 and 15, Beale-rd., u.t. 62 yrs., g.r. 10*l.*..... 360
Walthamstow.—7, Walpole-rd., u.t. 89½ yrs., g.r. 3*l.* 3*s.* 120

By WRIFORD & DIXONS.

Islington.—12, Oxford-ter., u.t. 452 yrs., g.r. 8*l.*, r. 45*l.* 510

By STIMSON & SONS.

St. John's Wood.—67, Avenue-rd., u.t. 35 yrs., g.r. 17*l.* 17*s.* 6*d.*, r. 140*l.*..... 1,400
Battersea.—157, Battersea Pk.-rd., u.t. 60¾ yrs., g.r. 8*l.*, e.r. 70*l.*..... 440
30, 32, and 34, Acre-st., u.t. 72½ yrs., g.r. 10*l.*... 550
Camberwell.—105, Grosvenor-pk., u.t. 21½ yrs., g.r. 5*l.*, r. 36*l.*..... 265
Balham.—3 and 4, Albert-ter., u.t. 62 yrs., g.r. 13*l.*, r. 58*l.* 500
Norwood.—127, Gipsy-hill, u.t. 76½ yrs., g.r. 10*l.*, r. 55*l.* 630
Kentish Town.—19, Spencer-rd., f., r. 30*l.* 500
21, Spencer-rd., u.t. 67 yrs., g.r. 6*l.*, r. 30*l.*..... 375
Shepherd's Bush.—28, Rockley-rd., f., e.r. 42*l.* .. 475
Kennington.—9a, Royal-rd., u.t. 47 yrs., g.r. 12*s.*, r. 36*l.* 410
Dulwich.—53, Henslowe-rd., u.t. 73 yrs., g.r. 4*l.* 10*s.*, r. 28*l.*..... 235
December 13.—By BELLHAM, WILLIAMS, & CO.
Wimbledon.—19 and 20, Park-rd., u.t. 76 yrs., g.r. 14*l.*, r. 80*l.* 700

By COCKETT & HENDERSON.

Wanstead.—Grove-rd., Holmwood, f., e.r. 90*l.* .. 950

By J. C. PLATT.

Acton.—1 and 2, The Villas, u.t. 96 yrs., g.r. 10*l.*, r. 65*l.* 470
Hammersmith.—31, Rivercourt-rd., u.t. 75 yrs., g.r. 10*l.* 10*s.*, r. 40*l.* 550
Hastings, Sussex.—55, High-st., and 5, Winding-st., f., r. 100*l.*..... 1,900
51, Emanuel-rd., f., r. 19*l.* 10*s.*..... 298
St. Leonards-on-Sea, Sussex.—Pevensey-rd., St. John's Villa, and Grosvenor House, u.t. 64½ yrs., g.r. 30*l.*, r. 150*l.* 1,525

By SCORELL & LAKE.

Maida Vale.—199, Sutherland-av., u.t. 38½ yrs., g.r. 9*l.*, r. 80*l.*..... 835
Totteridge.—Mayes-lane, an enclosure of land, 4a. 2 r. 10 p., f..... 300
Hornsey.—Cross-lane, a freehold cottage, stabling premises, and smithy, r. 103*l.*..... 1,930
New Barnet, Herts.—Station-rd., Errol Lodge, u.t. 60½ yrs., g.r. 7*l.* 10*s.*, r. 40*l.* 260

By A. J. SHEFFIELD.

Poplar.—19 and 20, Grove-villas, f., r. 65*l.* 750
1, 3, and 5, Willis-st., u.t. 43 yrs., g.r. 3*l.* 10*s.*.... 520

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 12 0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1 10 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 8 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts	1 12 0	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 6 6	,,	,, ,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 4 0	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
	s. d.		
Thames and Pit Sand	7 3	per yard, delivered.	
Thames Ballast	6 0	,,	,,
Best Portland Cement	32 0	per ton, delivered.	
Best Ground Blue Lias Lime	25 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s 6d.	per yard, delivered.	
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt.			

PRICES CURRENT (*Continued*).

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.	
Bath ,,	1 7	,,	,,
Farleigh Down Bath	1 8	,,	,,
Bear in blocks	1 6½	,,	,,
Grinshill ,,	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt	
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, 1 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt	
,, ,, ,, 6-in sawn both sides landings	2	7 per ft. super. deld. rly. depôt.	
,, ,, ,, 3-in. do.	1	2½ ,, ,,	

SLATES.

in. in.	£ s. d.		
20 × 10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep	
,, best seconds	10 15 0	,,	,,
16 × 8 best ,,	6 2 6	,,	,,
20 × 10 best blue Portmadoc	10 18 0	,,	,,
16 × 8 best blue Portmadoc	6 0 0	,,	,,
20 × 10 best Eureka unfading green	11 2 6	,,	,,
16 × 8 ,, ,,	6 15 0	,,	,,
20 × 10 Permanent green	10 0 0	,,	,,
16 × 8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles	42 6	per 1,000 at rly. depôt	
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0	
Deals: best 3 by 9	13 0 0	14 10 0	
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0	
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0	
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.	
¾ in.	1 0 0	,,	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 18 6	3 15 0	
Swedish balks	2 15 0	3 0 0	
Pitch pine timber (32 ft.)	3 0 0	3 10 0	

JOINERS' WOOD. At per standard.

White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0	
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0	
,, ,, 3 in. by 9 in.	15 10 0	16 10 0	
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0	
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0	
Do. 3 in. by 9 in.	16 0 0	17 0 0	
Battens	12 10 0	13 0 0	
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0	
Do. 3 in. by 9 in.	13 0 0	14 0 0	
Battens	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0	
Do. 3 in. by 9 in.	11 0 0	12 0 0	
Battens	10 0 0	11 0 0	
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	13 10 0	14 10 0	
,, ,, ,, 3 in. by 9 in.	12 10 0	13 0 0	
Battens	10 10 0	11 10 0	
Second white deals 3 in. by 11 in.	12 10 0	13 10 0	
,, ,, ,, 3 in. by 9 in.	12 0 0	12 10 0	
,, ,, battens	9 10 0	10 10 0	
Pitch pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes	32 0 0	33 10 0	
Broads (12 in. and up)	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,,	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7	
¾ in. do. do.	0 0 7	- - -	

PRICES CURRENT (*Continued*)

WOOD.

JOINERS' WOOD.

	At per standard. £ s. d.	£ s. d.	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6	
Prepared Flooring—	Per square		
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6	
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6	
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0	
6 in. at 6d. per square less than 7 in.			
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6	
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6	
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6	
6 in. at 6d. per square less than 7 in.			

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Fitch Plates	8 10 0	9 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

IRON.—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	13 5 0	- - -
Pipe in coils	13 15 0	- - -
Soil Pipe	16 5 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
,, ,, fourths	2¼d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, ,, fourths	3¼d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, ,, fourths	4¼d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, ,, fourths	5¼d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, ,, 21 ,,	4¼d. ,, ,,
½ Hartley's Rolled Plate	2¾d. ,, ,,
⅜ ,, ,, ,,	3¼d. ,, ,,
½ ,, ,, ,,	3¾d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 10
,, ,, ,, in barrels ,,	0 2 11
,, ,, ,, in drums ,,	0 3 1
Boiled ,, ,, in pipes ,,	0 3 6
,, ,, ,, in barrels ,,	0 3 1
,, ,, ,, in drums ,,	0 3 3
Turpentine, in barrels ,,	0 2 3
,, in drums ,,	0 2 6
Genuine Ground English White Lead per ton	21 10 0
Red Lead, Dry ,,	21 10 0
Best Linseed Oil Putty per cwt.	0 8 6
Stockholm Tar per barrel	1 12 0

[See also next page.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
Municipal Offices	Mountain Ash U.D.C.	75*l.*	Feb. 4
*New Buildings at Langho, near Blackburn	Chorlton, &c., Jt. Asylums Com.	200*l.*, 150*l.* and 100*l.*	April 4

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Works at Baths, Gannow	Burnley Corporation	Borough Surveyor, Town Hall, Burnley	Dec. 24
Cottage Home, Upton-by-Chester	Chester Guardians	T. M. Lockwood & Sons, Architects, 80, Foregate-st., Chester	do.
Retaining Wall, &c., Hartest	Melford (Suffolk) R.D.C.	W. Carver, Surveyor, Suffolk-road, Sudbury, Suffolk	do.
Six Houses, St. Luke's-road, Pontnewynydd		Fisher & Sons, Architects, Club Chambers, Pontypool	do.
Church, Dunnottar, Stonehaven, N.B.		G. P. K. Young, Architect, 42, Tay-street, Perth	Dec. 25
Paving Works, Portland-street	Kilmarnock Town Council	R. Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock	do.
Surveyor's Materials	Keighley Corporation	W. H. Hopkinson, Civil Engineer, Town Hall, Keighley	Dec. 26
Whinstone, &c.	Dumbarton Town Council	Burgh Surveyor, 16, Quay-street, Dumbarton	do.
House, Coedpoeth, Wales		W. L. Jones, Architect, Bangor	Dec. 27
Stabling, &c.	Morley (Yorks) Corporation	W. E. Putman, Civil Engineer, Town Hall, Morley	do.
Court House, Dulverton	Somerset County Council	W. J. Willcox, County Surveyor, 1, Belmont, Bath	do.
Surveyor's Materials	Penzance Corporation	F. Latham, Borough Engineer, Public Buildings, Penzance	do.
Steel Tower, &c.	Woodford (Northants) P.C.	— Lloyd, Engineer, Thrapston	Dec. 28
Entrance Lodge, Dunollie, Oban, N.B.		K. Macrae, 5, Argyll-street, Oban	do.
Car Shed, &c., Thurnham-street	Lancaster Tramways Committee	T. C. Hughes, Town Hall, Lancaster	do.
Schools, &c.	Rudry (Wales) School Board	B. Lawrence & Son, Architects, Newport, Mon	Dec. 30
Alterations to Schools, Pear Tree Green, Southampton	St. Mary U.D. School Board	G. C. Gandy, Woolston, Southampton	do.
Footbridge, Granton, N.B.	Leith Gas Commissioners	W. R. Herring, Engineer, New-street, Edinburgh	do.
Portland Cement	Queenstown (Ireland) U.D.C.	Kirkby & Doran, Engineers, Queenstown	do.
16 Cottages, Newbiggin-by-Sea		T. Welsh, Co-operative Stores, Newbiggin	do.
Covered Market, Crackenedge-lane	Dewsbury Corporation	H. Dearden, Civil Engineer, Town Hall, Dewsbury	Dec. 31
Paving Works, Langton and Hornby-streets	Middleton (Lancs) Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton	do.
Underground Convenience, Church-street	Preston Corporation	Borough Surveyor, Town Hall, Preston	do.
Hospital, Duke-street	Glasgow Parish Council	J. Baxter, 243, St. Vincent-street, Glasgow	do.
*Tar Paving Yards at Branch School	Shoreditch Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-st., S.W.	Jan. 1
Alterations to Market Hall, Portmadoc		M. Thomas, Civil Engineer, Council Offices, Ynyscynhaiarn	do.
Street Works, &c.	Whitley & Monkseaton U.D.C.	J. P. Spencer, C.E., Council Offices, Whitley, Northumberland	Jan. 4
Footpath	Carrickfergus U.D.C.	J. Boyd, Town Hall, Carrickfergus	do.
*Extension of Seacroft Hospital	Leeds Corporation	City Engineer, Municipal-buildings, Leeds	do.
*Tar Paving at Pymmes Park	Edmonton U.D.C.	G. E. Eachus, Town Hall, Lower Edmonton	Jan. 6
*Steam Road Roller and Road Scarifier	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	Jan. 7
Schools, Kingsland	Holyhead School Board	R. E. Pritchard, Bradford House, Holyhead	do.
Laying Main (12½ miles)	Tynemouth Corporation	J. Mansergh, Civil Engineer, 5, Victoria-street, S.W.	do
Water Supply Works, Bromsgrove, Worcester	Aberystruth School Board	R. O. Seacome, Shire Hall, Worcester	Jan. 8
Schools, Cwmcelyn, Blaina, Mon	Hornsey U.D.C.	R. L. Roberts, Architect, Abercarn	Jan. 13
*Road Making and Sewer Works	Commissioners of H.M. Works, &c.	Council's Engineer, Southwood-lane, Highgate, N.	Jan. 14
*Enlargement of Head Post Office, Plymouth	Bermondsey Council	Secretary's Office, Storey's Gate, S.W.	Jan. 15
*Underground Conveniences	The Vicar and Committee	Borough Surveyor, Town Hall, Spa-road, S.E.	Jan. 20
*Reseating of Nave, Parish Church, Brewood, Staffs	Bury Corporation	Ashton Veall, Architect, 84, Darlington-street, Wolverhampton	do.
*Central Tramway Depot	Chorlton Guardians	Borough Engineer, Bury	do.
*Additional Cottage Homes, Styal, Cheshire	Corporation of London	J. B. Broadbent, Architect, 15, Cooper-street, Manchester	Jan. 30
*Widening London Bridge	Moors & Robson's Brewery Co., Ld.	City Surveyor, Guildhall	Feb. 17
Mansion, Hove, Sussex	Mr. S. Worthington	Clayton & Black, Architects, 152, North-street, Brighton	No date
Rebuilding the Tally-ho Inn, Hull		Freeman & Co., Architects, 11, Carr-lane, Hull	do.
House, Thornton-in-Lonsdale, Ingleton		S. Worthington, Wheatsheaf Hotel, Ingleton	do
Hotel, Larne, Ireland		A. Gorton, Architect, 24, The Crescent, Morecambe	do.
House, Victoria-road, Penarth		Seddon & Carter, Architects, Cardiff	do.
Church, Cumming-street, Forres, N.B.		Ross & Macbeth, Architects, Queen's Gate Chambers, Inverness	do.
Wood Flooring at Schools, London-road, Burgess Hill	Clayton & Keymer School Board.	C. Botham, Architect, 128, Queen's-road, Brighton	do.
Sewer, &c., Altofts-road	Normanton U.D.C.	A. Hartley, Surveyor, County Chambers, Castleford	do.
Seventeen Cottages, Dinnington Colliery		Secretary, Seaton Burn Coal Co. A., Exchange Bldgs., Newcastle.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Application to be in
*Clerk of the Works	Southwark Guardians	3*l.* 13s. 6d. per week	Dec. 31
*Clerk of the Works	Warwick Guardians	3*l.* per week	Jan. 1
*Surveyor for the City Survey	Birmingham Corporation	120*l.*	Jan. 2

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. & x. Public Appointments, pp. xix.*

PRICES CURRENT (*Continued*).

VARNISHES, &c.

	per gallon. £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

R. H. & S. (Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

*** Owing to the Christmas holidays, the *Builder* will be published next week on Tuesday instead of Friday. All communications for the Editor must therefore reach our office not later than 10 a.m. on Monday morning.

* Denotes *accepted*. † Denotes *provisionally accepted*.

BARNSLEY.—For the execution of sewerage works, Elsecar, for the Hoyland Nether Urban District Council. Mr. W. P. Young, Surveyor, Town Hall, Hoyland, near Barnsley:—

James Moran	£161 18 4	J. S. Duncan	£136 16 5
G. H. Burrows	157 4 7	Isaac Hague, Hoyland*	115 13 3
M. Grantham	154 10 0		
M. O. Eyre	145 0 0		

BIRMINGHAM.—For the execution of private street works, Tudor-road, &c., Moseley, for the King's Norton U.D.C. Mr. Ambrose W. Cross, surveyor, 23, Valentine-road, King's Heath. Quantities by surveyor:—

John White, jun.	£744 4 0	Fitzmaurice & Co.	£507 8 0
Currall, Lewis, & Martin	570 12 9	Barnes & Co., Birmingham*	463 0 0
G. Trentham	539 0 3	Abel Cooper	460 16 6

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BOURNEMOUTH.—Tramway works for the Corporation of Bournemouth. Mr. F. W. Lacey, Borough and Tramway Engineer :—

Contract No. 14.—Engine House, &c., and Chimney Shaft.

	Engine House. £ s.	Chimney Shaft. £
Martin & Co.	16,396 10 ..	2,829
Hoare & Sons	13,647 0 ..	2,430
W. Hoare	12,819 0 ..	2,397
F. Osman	12,382 0 ..	1,953
Jenkins & Sons, Bournemouth	*11,719 0 ..	1,949
Myles & Warner, Stalybridge	— ..	2,694
The Alphons Custodis Chimney Construction Co., Sheffield	— ..	*1,215

Contract No. 15b.—Car Sheds.

Cooke & Co.	£8,222	Jones & Sons	£7,748
F. Osman	8,150	Hoare & Sons	7,658
Jenkins & Sons	8,087	Jones & Seward, Bournemouth*	7,640
W. Hoare	7,810		

CROYDON.—For three shops and dwelling-houses in Mitcham-road, Croydon, under the supervision of Mr. Arthur L. Dartnell, architect and surveyor, 73, North End, Croydon :—

Smith & Son	£1,950	F. Sedgwick	£1,189
Simmonds & Co.	1,550	Ludlow & Martin	1,165
E. Goulder	1,385	W. Roberts	1,075

EALING.—For the erection of D'Eresby House, Ealing Common, W., for the Metropolitan Guarantee Society, Limited. Messrs. Palgrave & Co., architects, Westminster :—

J. Barker & Co.	£26,342	Mead & Burton	£18,360
Whitehead & Co., Ltd., Clapham†	19,450		

GT. BERKHAMSTED.—For proposed new offices, strongroom, and laboratory at the chemical works, for Messrs. William Cooper & Nephews. Mr. Charles H. Rew, architect, Gt. Berkhamsted :—

C. Brightman	£1,335	Honour & Son*	£1,178
H. & J. Matthews	1,240		

[Architect's estimate, £1,225.]

HOVE.—For paving works, &c., for the Town Council. Mr. H. H. Scott, Borough Surveyor :—
Parsons & Sons, 118, Church-road, Hove* £1,269

ILFORD.—For the erection of car-sheds, &c., for the Urban District Council. Mr. H. Shaw, C.E., 7, Cranbrook-road, Ilford :—
G. Sharpe, Gibbins-road, Lett-road, Stratford £5,937

KIRKLEY, LOWESTOFT.—For new Congregational church, South Cliff, Kirkley, Lowestoft. Messrs. George Baines & R. Palmer Baines, architects, 5, Clement's Inn, Strand, W.C. :—

	Estimate A. Church.	Estimate B. Tower.
Cornish & Gaymar	£2,200 10	£341
G. E. Hawes	1,767 0	320
J. Welhem	1,750 0	280
C. R. Cole	1,698 0	297
J. S. Smith	1,670 10	271
J. Ashby, Lowestoft	1,378 0	238

[Architects' estimate, £2,000.]

LONDON.—For new police-station, Bow-road :—

	Credit.	
Lascelles & Co.	£50	£17,135
Willmott Bros.	50	16,953
Higgs Hill	46	16,640
Patrick & Son	50	16,640
Lathey Bros.	30	16,570
Holloway Bros.	50	16,351
Howell J. Williams	10	16,287
Lawrance & Sons	30	15,981
Grover & Sons	40	15,783
Perry & Co.	27	15,500
Allen & Sons	—	15,400
H. Lovatt	50	15,275
T. Parker	—	15,192
Ashby & Horner	50	15,020
F. & H. F. Higgs	—	14,988

LONDON.—For the execution of water-supply works at workhouse, for the Bethnal Green Guardians. Mr. G. H. Hughes, engineer, 97, Queen Victoria-street, E.C. Quantities by the engineer :—

R. D. Batchelor	£6,733 18 10	Tilley & Sons, London, E.*	£5,615 3 10
Mayho & Haley	5,724 15 4	Timmins & Sons	5,422 16 6
D. R. Paterson	5,690 0 0		

[Twenty-seven other tenders for sections only.]

LONDON.—For alterations and additions to the infirmary kitchen, St. John's Hill, Wandsworth, for the Wandsworth and Clapham Guardians, S.W. Mr. Cecil Alexander Sharp, architect, 11, Old Queen-street, Queen Anne's Gate, S.W. :—

Huntley Bros.	£597	R. A. Jewell	£444
A. Leather	567	Dakin & Co., Putney, S.W.*	347
J. J. Richards	490		
F. Clarke	486		

LONDON.—For feed-water boilers at the Abbey Mills pumping station, for the London County Council :—

For the Seven Boilers of 100 lbs. Pressure.

Taylor & Sons	£160	o each, or	£1,120 o
Tinker, Ltd.	140	o ,,	980 o
Tinker, Shenton, & Co.	123	o ,,	861 o
Spurr, Inman, & Co.*	104	10 ,,	731 10

For the Three Boilers of 150 lbs. Pressure.

Taylor & Sons	£170	o each, or	£510 o
Tinker, Ltd.	150	o ,,	450 o
Tinker, Shenton, & Co.	140	o ,,	420 o
Spurr, Inman, & Co.*	106	10 ,,	319 10

HENDON.—For the following works for the Urban District Council. Mr. S. Slater Grimley, Engineer :—

	Edgware-road Surface Water Drain. £ s. d.	Stanley-road Sewer. £ s. d.	Boundary Wall at Offices. £ s. d.	Removal Steam Roller Shed. £ s. d.	Of Mortuary. £ s. d.
Ford, C.	825 0 0	272 5 4	—	—	—
Dickson, J.	826 14 0	236 7 4	—	—	—
Paterson, D. R.	808 8 0	217 0 0	—	—	—
Weston & Hale, Harlesden	795 18 6*	197 11 0*	305 0 4	26 0 0	17 0 0
Judson, G. A.	—	—	355 13 6	42 0 0	24 0 0
Tout, Wm. Hendon	—	—	276 1 2*	21 0 0	12 10 0
Barton, C. C., W. Hendon	—	—	280 13 0	16 0 0*	10 0 0*

LONDON.—For the execution of Section A of the works to be done at the Crossness outfall in connexion with the extension of the main drainage system on the south side of the river Thames, for the London County Council :—

Cochrane & Sons	£124,949 10 0
Jones & Sons	115,699 9 0
Cooke & Co.	96,846 14 3
Bentley & Loch	82,597 4 0
Kirk & Randall	79,912 5 4
Squire & Co.*	73,980 2 7

LONDON.—For wiring and fittings for electric light installations at the Manchester-square, Bishopsgate, and Brompton fire stations, for the London County Council :—

Manchester-square Station.

C. Esson (informal)	£259 0 0
J. Sperati	378 0 0
Coleby & Co.	295 10 0
Peacock & Co.	280 0 0
Barlow Bros. & Co.	257 0 0
Weston & Co.	247 14 4
Graham & Biddle	240 0 0
J. H. Rake	226 10 0
The National Electric Wiring Co., Ltd.	221 9 0
G. W. Clarke	197 9 4
Jackson Bros.	177 8 6
Ellis, Potten, & Co.*	170 0 0

Bishopsgate Station.

C. Esson (informal)	£215 0 0
J. Sperati	313 0 0
Coleby & Co.	273 0 0
J. H. Rake	256 10 0
Peacock & Co.	247 0 0
Barlow Bros. & Co.	247 0 0
Weston & Co.	221 18 3
The National Electric Wiring Co., Ltd.	103 12 0
G. W. Clarke	168 7 6
Jackson Bros.	159 7 0
Ellis, Potten, & Co.*	150 0 0

Brompton Station.

C. Esson (informal)	£125 10 0
J. Sperati	186 0 0
Barlow Bros. & Co.	170 0 0
Coleby & Co.	165 0 0
Weston & Co.	148 14 0
Peacock & Co.	145 11 0
J. H. Rake	136 10 0
Graham & Biddle	120 0 0
National Electric Wiring Co., Ltd.	115 8 0
Ellis, Potten, & Co.	104 0 0
Jackson Bros.*	98 2 6

LONDON.—For the completion of King's Gardens, West Hampstead, N.W., for Mr. Herbert Kempson Reeves. Messrs. Palgrave & Co., architects, 28, Victoria-street, S.W. Quantities by Mr. C. E. Pease :—
Gray & Co., Shepherd's Bush £33,750

MIDDLESBROUGH.—For the execution of street works, for the Corporation. Mr. Frank Baker, Borough Engineer, Municipal Buildings, Middlesbrough :—

Sussex and South Streets.

D. & J. Stratton	£2,630 15 7	Crombie & Son	£1,862 3 2
Keighley & Riddiough	2,084 7 2	Smiles, Ltd.	1,824 17 9
A. E. Hobbs	2,042 6 1	J. G. Spooner, Stockton-on-Tees*	1,724 16 11
G. E. Simpson	1,993 10 0		

Marton-road and Wilson-street.

D. & J. Stratton	£2,738 2 8	J. R. Smiles, Ltd.	£5,154 8 3
Keighley & Riddiough	5,566 3 6	Crombie & Son	4,988 19 9
A. E. Hobbs	5,451 10 11	J. G. Spooner, Stockton-on-Tees*	4,716 4 7
G. E. Simpson	5,189 9 10		

Newport-road (from St. Paul's Church to the Borough Boundary).

D. & J. Stratton	£4,062 5 10	J. G. Spooner	£3,126 17 6
G. E. Simpson	3,387 10 0	Crombie & Son	3,100 18 9
Keighley & Riddiough	3,371 0 10	J. R. Smiles, Ltd., Middlesbrough*	3,070 14 7
A. E. Hobbs	3,215 16 8		

OTLEY (Yorks).—For the construction of a reservoir &c., Middleton, for the Urban District Council. Mr. John Waugh, C.E., Sunbridge-chambers, Bradford. Quantities by engineer :—

Wilson & Son	£74,661 0 0
T. Smith	56,750 13 7½
P. Drake	54,378 0 0
Arnold & Son, Doncaster*	49,500 0 0
W. Binns	47,500 0 0
Eagan & Sons	45,092 8 6
W. Brigg	44,500 0 0

RAMSEY (Hunts).—For new schools (mixed) and schoolhouse, for the School Board. Mr. J. G. Stallebras, architect, North-street, Peterborough. Quantities by the architect :—

R. Shanks	£6,258 0 0	J. Bridgefoot	£4,874 10 7
W. Wade	5,779 0 0	Parren & Son	4,836 14 6
F. B. Thackray	5,580 0 0	C. Wright	4,829 0 0
J. Cracknell	5,258 0 0	M. J. Allen	4,821 12 8
D. Gray	5,252 10 0	H. Watson	4,686 0 0
Thurley Bros.	5,145 0 0	J. Bateman, Ramsey*	4,487 0 0
R. J. Nichols	5,050 0 0	Hipwell & Co.	4,484 0 0
J. Lucas	5,050 0 0		
J. Guttridge	4,905 0 0		

LONDON SCHOOL BOARD TENDERS

AT the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect :—

** Recommended for acceptance.*

ADYS-ROAD SCHOOL (East Dulwich).—For refitting boys' and girls' lavatories :—

Lawrance & Sons	£145	Baylis & Francis	£100
G. Parker	130	G. Kemp	97
H. Groves	125	Falkner & Sons*	91

EVERINGTON-STREET SCHOOL (Fulham).—For executing repairs to furniture :—

Galbraith Bros.	£111 16 5
Hammer & Co., Ltd.	109 19 0
H. Bouneau	87 5 0
General Builders, Ltd.	86 7 5
London School Furniture Co.	79 1 1
T. Cruwys	73 11 0
H. J. Williams*	63 6 8

GREENING-STREET SITE (Abbey Wood).—Re-erecting iron buildings to be removed from the Santley-street site, Brixton :—

Hawkins & Co.	£1,850	Mitson & Harrison	£1,630
W. Harbrow	1,768	Smith & Co.*	1,535

HAVERSTOCK HILL SCHOOL.—New lavatories for boys' and girls' departments :—

T. Cruwys	£636	C. W. Killingback & Co.	£420
G. S. S. Williams & Son	626	Marchant & Hirst*	415
Stevens Bros.	596		

HIGH-STREET.—Interior cleaning :—

A. W. Derby	£244 0	Gibb & Co.	£218 0
Dolman & Co.	221 0	A. J. Sheffield	204 0
		J. T. Robey*	£203 10

HIGH-STREET SCHOOL (Plumstead).—For office inside building :

W. J. Howie	£132 0	H. Groves	£95 0
G. Parker	130 0	G. Kemp	78 0
Baylis & Francis	120 0	E. Proctor*	49 10

HEAD OFFICES OF THE BOARD.—For electri light pendants in the Evening Continuation Schools Department :—

Peto & Radford, Ltd.	£45 0	J. C. Christie	£39 15
Rashleigh, Phipps, & Co.	44 0	Lund Bros. & Co.*	34 13

MITCHAM-LANE SITE.—For re-erection of iron buildings to be removed from the Fulham Palace-road site :—

Humphreys, Ltd.	£1,810	J. McManus	£1,598
T. Cruwys	1,780	Smith & Co.	1,456
Mitson & Harrison	1,649	Hawkins & Co.	1,450
J. & W. T. Hunter	1,620	Leather & Sons*	1,338

REDDINS-ROAD SCHOOL (Peckham).—For sanitary and drainage work :—

Martin, Wells, & Co., Ltd.	£3,024 0 0	J. & C. Bowyer	£2,667 0 0
Rice & Son	2,972 0 0	Johnson & Co., Ltd.	2,584 0 0
Maxwell Bros., Ltd.	2,896 3 5	Falkner & Sons	2,577 0 0
W. Downs	2,697 0 0	G. Parker*	2,491 0 0

SETTLES-STREET SCHOOL (Stepney).—For refitting girls' and infants' offices :—

Martin, Wells, & Co., Ltd.	£749 0 0	G. Neal	£340 0 0
Falkner & Sons.	633 0 0	F. & F. J. Wood	499 0 0
R. P. Beattie	589 6 5	J. T. Robey	489 10 a
		Gibb & Co.*	440 0 0

[See also next page

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Running Contracts for the supply of various articles of furniture, &c. :—

Contractors.	Cupboards (Modelling.)	Blackboards (Large) for K.G. Stands.	Drawing Stands, Kindergarten.	Bench Cheeks (No. 1).	Bench Cheeks (No. 2).	Bench Stops (No. 1).	Bench Stops (No. 2).	Bench Stops (No. 3).
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
H. Bouneau ..... each	*18 0 0	*0 15 6	*2 0 0	0 1 6	0 1 5	0 0 2½	0 0 2½	0 0 4
Bruce, Croom, & Co. .. each	18 5 0	1 3 6	2 9 6	0 1 10	0 1 7	0 0 2½	0 0 3	0 0 3½
T. Cruwys ..... each	23 19 0	—	—	—	—	—	—	—
Educational Supply Association, Ltd. ..... each	23 0 0	—	—	—	—	—	—	—
G. M. Hammer & Co., Ltd. each	20 10 0	1 2 0	2 3 6	0 2 6	0 2 3	0 0 3	0 0 4	0 0 6
Lonnie & Co. ..... ,,	22 10 0	—	—	—	—	—	—	—
W. Martin..... ,,	—	1 6 0	2 15 0	0 1 6	0 1 4	0 0 2½	0 0 3	0 0 5
E. Spencer & Co. .... ,,	—	1 19 0	4 0 0	*0 0 8	*0 0 7	*0 0 1	*0 0 1½	*0 0 2½
Wrinch & Sons..... ,,	—	1 4 0	2 10 6	0 0 1 2	0 0 1 0	0 0 2 3	0 0 3 3	0 0 4 0

Digging and planting borders, &c., at the following schools :—

Contractors.	Old Woolwich-road.	Shillington-street.	Surrey-lane.	Tooting Graveney.	Warple-way.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Cutbush & Son	6 2 0	6 5 0	2 6 0	3 0 0	3 0 0
A. Durrant.....	4 12 0	7 0 0	3 5 0	4 0 0	3 10 0
G. Footer	*4 5 0	*4 15 0	*1 19 6	2 11 6	2 11 0
R. Neal	5 7 0	6 15 0	2 4 8	*2 7 6	*2 9 6
Williams & Son.....	6 3 0	8 4 0	3 15 0	5 0 0	4 2 6

RUNNING CONTRACT FOR REPRODUCING DRAWINGS :—

	s. d.	s. d.	s. d.	s. d.
Cook & Hammond....	17 0	—	—	—
Stanley & Co., Ltd. ..	13 4	—	—	—
London Drawing and Tracing Office.....	12 8	12 0	10 8	8 0
Norton & Gregory ..	9 0	6 10	6 0	—
Vincent Brooks, Day, & Son, Ltd.....	10 2	7 11	4 3	—
A. P. Mallandain	7 10	6 8	6 6	—
Photo Printing Paper Co.....	7 6	—	—	—
Saunders & Co.....	5 2	—	—	—

The samples and schedules of prices submitted by the various contractors have been carefully examined by the Architect, who is of opinion that the system adopted by Messrs. W. N. Saunders & Co., and the Ferro-gallic system of Messrs. Norton & Gregory, would be suitable for the Board's work. The Committee accordingly recommend that the tenders of these two firms should be accepted, in order that there may be no delay in carrying out the work required.

TIMBERCROFT-ROAD SITE (Plumstead). — For providing two new iron buildings, and for re-erecting one iron building to be removed from the Trafalgar-square site :—

Rowell & Co.	£3,872	Humphreys, Ltd. ..	£1,000
T. Cruwys.....	2,200	W. Harbrow.....	1,850
Hawkins & Co.	1,950	Smith & Co.*	1,830

TOWNSEND-STREET SCHOOL (Old Kent-road).—For stepped flooring, partitions, &c. :—

London School Furniture Co.	£1,125	Marsland & Sons	£660
Spencer & Co.....	834	Rice & Son	619
Wake & Dean, Ltd...	680	Garrett & Son.....	609
		E. Triggs*	572

WINSTANLEY-ROAD INFANTS' SCHOOL (Battersea).—For hall and other improvements; providing three new classrooms for 60, 60, 66; converting two existing classrooms into hall, and providing additional lighting; providing teachers' room; converting teachers' present room into additional cloakroom; providing infants' lavatory, water-closets, and urinal; forming new entrance, and enclosing, draining, and tar-paving the additional land. The revised accommodation of the infants' department, on the completion of the improvements, will be for 428 children, being a net gain of 41 places :—

J. Marsland & Sons	£2,978	E. Triggs	£2,622
Holloway Bros.	2,911	Stimpson & Co.	2,600
W. Downs	2,905	J. & M. Patrick	2,499
Lathey Bros.	2,837	F. & H. F. Higgs ..	2,481
E. P. Bulled & Co...	2,749	Johnson & Co., Ltd.	2,450
J. Garrett & Son....	2,730	W. H. Lorden & Son*	2,388
J. Carmichael	2,680		

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The Builder.

VOL. LXXXI.—No. 3073. DECEMBER 28, 1901.

ILLUSTRATIONS.

Madonna and Child: Studies for a Painting for Church Decoration ..... By Mr. N. H. J. Westlake.
Palace of Charles V. at Granada ..... Drawn by Mr. A. T. Bolton, A.R.I.B.A.
La Giralda at Seville ..... Drawn by Mr. A. T. Bolton, A.R.I.B.A.
Reredos, St. Katharine's Chapel, Queen-square ..... Mr. John Medland, F.R.I.B.A., Architect.
Design for St. Luke's Church, Maidstone ..... Mr. W. H. Seth-Smith, F.R.I.B.A., Architect.
"Gilling Grove," Kendal ..... Mr. John F. Curwen, F.R.I.B.A., Architect.
Curate's Residence, Stanmore ..... Mr. John F. Curwen, F.R.I.B.A., Architect.

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An Imperial Lecture on Art.

WHETHER we like or do not like the Emperor of Germany, it must be admitted that he is the most dramatically interesting Sovereign who has sat on a European throne since the days of Napoléon. He is full of surprises; in the words of Falstaff, "one knows not where to have him." He is ready to set all the world right about everything, and his latest appearance has been as a lecturer on modern sculpture and its tendencies and temptations, on the occasion of his inviting to dinner all the sculptors who have been employed on the Avenue of Victory at Berlin. And to a considerable extent, at all events, Imperial lecture justified itself. It contained some very wise remarks, which are worth the attention of artists.

That the Emperor should have thought that the Avenue of Victory would be the astonishment of foreign visitors, and that German sculpture had shown itself to be equal to the sculpture of the Renaissance, is of course only what one must expect. That is the natural attitude of the Teuton mind. The Emperor would no doubt have fully sympathised with the gentleman who tried to stop Heine from speaking at a patriotic meeting, with the caution—"At this German meeting must the German German speak." So far we fear we cannot go with the Emperor. Whether an actual visit to the "Avenue of Victory" would convert us it would be rash to speculate, but our present impression of German sculpture is that it is marked by a certain rude and trenchant vigour combined with a lamentable want of refinement; and that as to any comparison with Renaissance art, Michelangelo's Medici tomb figures are by themselves worth more than all the united artistic genius of modern Germany could produce. But nevertheless it is a fine thing to see that Germany believes in her sculptors, as England — officially at least — does not. When one of the competitors for the Queen Victoria Memorial proposed to line his drocessional road from end to end with groups of sculpture, the leading journal asked, with a slight suspicion of a sneer, where we were to find the sculptors to produce all these works. The fact is that we are much better provided with sculptors for such a task than we have any reason to believe that Germany is. English sculpture has never been in so flourishing and hopeful a condition, artistically considered, as it is at this moment. Mr. Spielmann has just brought out a critical and illustrative book on contemporary English sculpture* which, in its numerous illustrations, affords a very good panoramic view of the recent productions of English sculpture; and no one, we think, can turn over its pages without being struck by the variety, originality, and refinement, of most of the work there represented. But these sculptors get little or no encouragement or employment from our Government. Herein the Emperor of Germany has set our rulers an example which they might well take to heart. He went, he said, on the principle that there should be direct relation between the artists and him who gave the commissions, without the intervention of the machinery of juries and committees. What the German artists thought of this we do not, of course, know. It is commonly supposed that in the multitude of counsellors there is safety, and to dispense with them was a somewhat daring, and would in this country probably be thought a too autocratic mode of procedure. But the Emperor seems to have done exactly the right thing. He gave the idea of what he wanted; with the assistance and advice of Herr Begas, and his own personal knowledge acquired from visits to a good many studios, he selected the artists; but having done so, he left each of them free to treat his own special subject in his own way, recognising that "every work of art implies some particle of the individual character of the artist." As a principle of procedure we do not see that he could possibly have done better; and though such personal management of such a matter on the part of the Sovereign would hardly be possible in our more constitutional country, nevertheless one cannot but feel that the spectacle of the Sovereign of a great country personally interesting himself in the production of a series of works of art for the adornment of his capital, selecting the artists and gathering them round him to have a talk about it when the work was completed, is in itself a wholesome and refreshing one, and does not in the least call for the sneering tone with which it has been commented on by some English journalists. The Emperor knows and cares more about art than they do, at all events.

The remarks which the Emperor made about modern art, after a reference to the opening of the collection of antique art at the Pergamon Museum, are particularly wise and well-timed. Sculpture, he said, still remained for the most part free from the influence of certain modern tendencies and movements; he evidently referred to the tendency to sensationalism which has so much beset modern painting—to the representation of ugliness rather than of beauty, in the search for novelty: and he urged his hearers to keep it so. Art that ignored the laws and limits of æsthetic beauty, so remarkably illustrated in the antique sculpture to which he had been referring, was no longer art; "it is a manufacture, it is an industry, which art must never become." Of no art is this more true than of sculpture, which is essentially an ideal, not a realistic art. French sculpture, though at its best it is still at the head of all, has been painfully invaded by this bane of sensationalism and realism, which, if not checked, will go far to ruin the art in France. Modern English sculpture, with all its variety and originality, has hitherto kept clear of this deteriorating influence; it is to be hoped that it will continue to do so; but in painting we are unfortunately not without too many examples of the kind of art which, as the Emperor says, "descends into the gutter" for its inspirations. Artists who follow this path, he thinks, whatever their talents, are on the wrong track. "If art, as is often the case nowadays, does nothing but depict misery in a guise even more hideous than the reality, it is sinning against the German people. . . . The art which descends to advertisement is no longer art, though it be extolled a hundred and a thousand times. The feeling for what is ugly or beautiful* is in every man, be he

* "British Sculpture and Sculptors of To-day." By M. H. Spielmann. London: Cassell & Co. 1901.

* We quote from the *Times* correspondent's report but probably what the Emperor really said (or at all events meant to say) was, the perception of the difference between the ugly and the beautiful.

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ever so humble; and I need you all for the further cultivation of this sense among the people; and for having performed a piece of this kind of work in the Avenue of Victory I give you most especial thanks." Whether the Avenue of Victory sculptures are all that the Emperor takes them to be is a matter about which there may be differences of opinion; but at all events these are noble words to be addressed by a Sovereign to his artist subjects.

PUBLIC HEALTH AND HOUSING.

IN our issue of February 16 of this year we gave a brief synopsis of the history of the Housing Question in London, based on the special Report prepared by the London County Council, and expressed the conviction that the problem could only be effectually met by the combined efforts of public bodies and private enterprise; neither is alone sufficient to the task; and therefore that municipal authorities should not endeavour to crush out private enterprise. The question as to who should do it, however, though it is the first step in the matter, is after all hardly so important as the question how it should be done; and on this head the suggestions of an able medical man* who has made the hygiene of the dwelling a special study, are worthy of careful consideration.

The sub-title to Dr. Sykes's book evidently refers to the change which has gradually been developing from the house to the "flat" system. A "house" may indeed be let to different families on different floors, but the essential difference between a house and a flat is that in the former the sanitary conveniences are mostly all in the basement, in the "flat" they are provided, or may and should be provided, on the same floor with each dwelling. There are those who maintain that "flat" houses should have the latrines grouped on upper or lower floors, or even out of the building. We have always held that for reasons of privacy and order each habitation in a flat should contain within itself the necessary provision for everything in the household life except the washing of clothes, which is a business of only weekly occurrence. As Dr. Sykes puts it—

"What chance has a respectable family of observing the decencies of life in a house where there are one or two dissolute families, where the domestic and sanitary conveniences are all used entirely in common, and the members of the respectable family, even the youngest, are continually traversing the house to and fro? If domestic and sanitary conveniences are provided on each floor, those living on that floor can at least cultivate their own good habits in their own way. What is wanted is to procure for families as much privacy as can be obtained, and to reduce the common usage to the smallest proportions possible."

In regard to considerations of order and decency this is obvious enough, but Dr. Sykes adds another argument the force of which is not so generally realised. In the case of families (and there are numbers of such cases) living on the top floors of houses some 40 ft. high, where the water-taps, sinks, water-closets and dust-bins are situated at the ground floor or basement, Dr. Sykes points out that it is usually assumed that twenty times more energy is expended in walking up stairs a certain height than in walking the same distance on the level:—

"Therefore walking to the top of a four-story house is equivalent to walking about 800 ft. upon the level, and, say a cottage measures 15 ft. frontage, this is equivalent to walking past a row of over fifty-three cottages to reach the common sanitary conveniences above mentioned. What would be the opinion of a medical officer of health or of the Local Government Board if provision were as inadequately made even in a rural district? Yet this is the condition that prevails over a large part of London."

The case could hardly be more strongly or practically put. If it be said that in the cheapest class of tenements economy of structure demands the concentration of the water-closets, it may be replied that concentration can be made, to a certain extent, vertically as well as horizontally, and that water-closets, sinks, &c., may be combined in a tower or projection running through all stories and serving two tenements on each floor, with separate access. This is the method specially recommended by Dr. Sykes in the case of the structural adaptation of "floor" houses into "flats," but it might very well be applied to new houses built as flats.

To come back to the primary objects of Dr. Sykes's book, let us see what light he throws, from the medical point of view, on the question of the hygienic effect of the increasing tendency, among upper classes as well as lower classes, to live in flats rather than in separate houses. The fact that rate of mortality increases, in the main, with density of inhabitation per square area, has long been admitted; Dr. Sykes puts it that in consequence of the altered conditions arising from the increased use of dwellings in flats, we have now rather to consider density of inhabitation per cubic space. This may be a simpler way of dealing with statistics for the purpose of practical application, but we do not see that it really makes much difference. If there are twenty people in a four-story house where there used to be ten people in a two-story house of the same area the density per square area is doubled, and we do not see that the fact of their being piled one above another vertically materially modifies the case, for their relation to the amount of sun and air available around them (which is one of the most important factors in the matter of hygiene) is practically much the same. It seems to us, in fact, rather important to keep in view this aspect of the problem, because on it hangs the necessity (which we cannot for a moment doubt) of demanding that increased height in building should be accompanied by wider spacing between buildings. This is exactly one of the things which estate-owners or their agents in London cannot be made to see, and which the law ought to compel them to see, whether they will or no. In Bloomsbury, for instance, which according to statistics has figured as about the healthiest part of London, a considerable number of sites have recently been cleared of the old houses and rebuilt upon with houses in flats nearly or quite twice as high as the old houses, on the same amount of land. It is ridiculous to suppose that this can go on without affecting the health statistics of the district; and legislation ought to put a check upon it. It does not appear, moreover, from Dr. Sykes's statement, that there are at present any extensive statistics available in regard to rate of mortality in relation to density of cubic space inhabitation, at all events in London. Some statistics in regard to the proportion of the death-rate to the number of rooms in dwellings—which may be taken to represent approximately the relative size of the dwellings—are very significant. Dr. Sykes gives a table from Glasgow of the comparative death-rate in dwellings of "one and two rooms," "three and four rooms," and "five rooms and upwards"; the figures are respectively 27·74, 19·45, and 11·23. We have only space to give the totals; the table is classified for various diseases, but in some special forms of disease the difference is even more startling; in the case, for instance, of "nervous diseases and diseases of nutrition of children," the respective death-rates are 4·80, 2·35, 0·91. Here of course comes in the element of want of adequate separation, and the use of the same room for living and sleeping. It is a better hygienic condition to inhabit two small rooms than one large one on the same floor area. In dealing with statistics of persons per room, the author considers as "overcrowded" all dwellings in which the number of inhabitants is more than double the number of rooms. The following table gives the results in this respect for six of the capital cities of Europe:—

City and date.	Population.	Overcrowded population.	Percentage overcrowded.	Mortality of whole city.
London (1891) ..	4,211,743	830,182	20 per cent.	21·4
Paris (1891)	2,424,705	331,976	14 ,,	21·6
Berlin (1885) ..	1,315,387	363,960	28 ,,	24·6
Vienna (1890) ..	1,364,548	387,000	28 ,,	24·6
Budapest (1891)	463,759	348,609	74 ,,	28·0
St. Petersburg (1890)	956,226	442,508	46 ,,	28·4

Table showing relation of mortality to overcrowding of persons per room, in six capitals of Europe.

It is stated that the comparative results as between Budapest and Paris are not so different as appears at first sight, because in the Budapest returns only the actually inhabited rooms are taken, excluding lobbies and other apartments not permanently inhabited, whereas in the Paris returns all apartments within a tenement are included; therefore the proportion of overcrowding in Budapest may be exaggerated and that of Paris under the mark. This will not however entirely account for the much lower proportion of death-rate to overcrowding in London than in Paris, which may be fairly set down to the generally better sanitary state of London, owing to the sanitary reform and legislation of the last half-century.

In his chapter on the "Effects upon Health of Certain Kinds of Dwelling-Houses and Dwellings" Dr. Sykes disposes effectually of the attempts which have been made to defend back-to-back houses, showing that according to careful statistics as to comparative mortality in the same town, back-to-back houses have a mortality per 1,000, for all diseases, one-third higher than that for through houses. This seems unanswerable, and yet there are town authorities who will persist in defending, or excusing, this method of building, on grounds of so-called economy. Dwellings over stables are another class of habitations of which the mortality statistics in

* "Public Health and Housing: the Influence of the Dwelling upon Health in Relation to the Changing Style of Habitation." By John F. J. Sykes, M.D. London: P. S. King & Co. 1901

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London, especially for infants, are very high. The mortality in these dwellings for infants under one year of age is, for all diseases, nearly double the general mortality at the same age for London; and for bronchitis and pneumonia it is more than double. Although we do not in any case favour or defend dwellings over stables, we do not see any necessity for such a death-rate as this if they were properly constructed, with solid impervious floors between the stable and the dwelling, and efficient through ventilation. In many cases, however (as those Londoners will know who happen to live in terraces looking on to the back of a "mews"), the houses are, in regard to through ventilation, in the same condition as back-to-back houses, the back wall being unpierced with windows, probably to prevent the depreciation of the better-class house property by having stable-dwelling windows overlooking their backs or their gardens; and in the case of the older buildings the floors between stable and dwelling are only boarded. This latter defect can easily be remedied now by concrete floors, but the question of the back windows is a difficulty that can hardly be got over, for there can be no doubt that their existence would amount to a serious depreciation of any terrace-house property on which they faced. The moral is that such dwellings should be discontinued, and the existing ones disestablished as soon as may be. The present London Building Act compels the interposition of the concrete floor in any new building of the kind, but it does not provide for through ventilation, since, as long as there is only one room in the width of the building, the required windows may all open towards the stable-yard. In a mews on a large scale, where there is room for an inclined plane to be worked in, the problem might perhaps be better met by building the stables in two stories and grouping the dwellings separately from them, since it is probable that a certain number of dwellings on the spot are practically a necessity.

In regard to such large blocks of artisans' dwellings as the Peabody buildings and others of similar type, statistics show that the general death-rate is lower in these than the average of London; but that on the other hand the death-rate for disease propagated by direct infection is higher; which is exactly what we should have expected. In regard, however, to the death-rate for all causes, Dr. Sykes is of opinion that the statistics for these buildings can hardly be taken as normal, inasmuch as they are occupied by what is really a selected population living under special conditions, and for this and other reasons any comparison between the statistics as to the houses demolished on an insanitary area, and the new buildings erected on the site, would be of little value.

On the other hand, some most important comparisons are made in regard to the health effect of different systems of fœcal removal: comparisons which, we are not surprised to find, are entirely in favour of the water-closet system—the only system, in our opinion, fitted for a civilised city. The advocates of the nasty system, as we do not scruple to call it, of pail-closets, should take to heart the statistics quoted by the author from the Report of Dr. Boobbyer, the Medical Officer of Health for Nottingham, in regard to the distribution of typhoid fever in Nottingham during ten years (1887 to 1896), in houses with different types of closets. This investigation showed that in midden-privy houses the proportional annual incidence was one case for every 37 houses; in pail-closet houses, one in 120; in water-closet houses one in 558: figures which require no comment. He found also—which is easily comprehensible—that the disease was much more liable to recur after it had arisen in the privy and pail-closet houses than in the water-closet houses:—

"Of the eleven third consecutive cases that occurred in single houses, three were in privy houses, eight in pail-closet houses, none in water-closet houses. Of the four fourth consecutive cases in single houses, all were in pail-closet houses. He pointed out that the closet-pail is essentially only a small portable privy above ground, and is capable of polluting the air, the soil, and the surroundings almost as much as the privy, especially by spilling and leakage in scavenging."

Dr. Sykes's chapters in regard to the arrangement of houses in streets contain nothing new, except that he draws attention usefully to the bad features of arrangements (illustrated by block plans) whereby the angle houses become back-to-back houses. In regard to blocks built in straight lines he also draws attention to the fact that "wherever there is a central wall or partition separating the front rooms from the back rooms," there is the type of the back-to-back dwelling. He means, we presume, wherever there is no direct opening between these front and back rooms, but only outer openings to them separately from a staircase. The common staircase, too, unless to some extent permanently open to the air, is a means not of ventilation, of communicating to one dwelling the air that has been breathed in another. Staircase windows ensure light, but not ventilation. In many cases they are never opened.

The author's remarks about the treatment of the ground adjoining houses are important and worth quoting:—

"With regard to the surface of the open spaces immediately contiguous to dwelling-houses, the soil in towns always becomes polluted and prejudicial to health. There are two ways in which it can be effectually dealt with: the one is by cultivation as a garden, the other is by impervious paving, so levelled and drained as to be readily cleansed. As a temporary expedient, the surface may be gravelled and rolled, but this is not of permanent benefit. Many small gardens in towns are merely barren wastes, and in deciding whether it is a garden or a yard, the test is whether it is regularly cultivated with grass or permanently paved. It should be definitely provided that such spaces should be regularly cultivated or permanently paved, instead of leaving it to vague by-laws that are difficult, if not impossible, to interpret."

If we ask what, amid all the useful suggestions as to details, is the general recommendation Dr. Sykes has to make to the housing problem, considering it in the light of providing sufficient and healthy dwellings for those who require them, it seems, though nowhere very clearly or consecutively stated, to amount to this:—That it is of no use to think that those who are turned out of insanitary property which has to be pulled down, can be provided for by the erection of buildings in far suburbs and the provision of increased and cheaper means of transport. They will not all transport their chattels to a distance; they want to be near their old neighbourhood and near their work. Nevertheless, he holds that demolition of insanitary and overcrowded property must always have a good effect. Its effect is "not only to destroy the houses, but also to disperse the worser elements among the better elements of the population;" in other words, to dilute the evil. On the other hand, a large number, not perhaps of the worst, are by the demolition driven into sublet houses unsuited to the use to which they are put. But these might be altered and adapted to their new usage at no very great expense; and in the effort to do this, to make the best of the houses available by altering and adapting them, Dr. Sykes thinks the greatest hope of regeneration lies. It is not what is called a heroic remedy; that it is so very simple and matter-of-fact is perhaps its best claim to attention.

NOTES.

Home and Colonial Stores *v.* Colls.

IN this appeal case in regard to right of light, which is reported in our legal column, it appears that the defendant has suffered from an unexpected and very hard measure on the part of the Appeal Court. In the first action, which was to restrain the defendant, a well-known builder, from erecting a building which it was contended would obstruct the ancient lights of the defendants, it appears that the principal claim was in respect of a large ground-floor window lighting an office where a number of clerks worked; but though these windows were of large size, it appears that the upper portion of them was filled 20 in. deep with stained glass, and the lower portion covered with horse-hair blinds, so that it would not seem that the demand for light was so very great after all. Mr. Justice Joyce, before whom the case was heard, found for the defendant, on the ground that there was no substantial injury to the plaintiffs' light. Plaintiffs gave notice of appeal; and meantime the defendant—it may be said, rather imprudently—went on with his building. The Court of Appeal has reversed the judgment, on grounds which appear in the report, and has ordered the defendant to pull down his building. This is where we consider the hardship occurs. The defendant took the risk of the reversal of judgment, but he probably never contemplated having to remove the building. Claims of this kind, as we have frequently pointed out, can be settled by compensation; and it has appeared that judges were rather disposed to take this view. The moral of the case is perhaps, that it is more prudent not to proceed with a building when there is an appeal pending; but to compel the defendant to pull it down seems to be an unnecessarily harsh procedure in the case of a damage to light which was at all events disputable, and savours rather more of law than justice.

Crystal Palace Gas Exhibition.

THE International Gas Exhibition which is now being held at the Crystal Palace cannot be regarded as worthy of the industry which it is supposed to represent, and many of the best-known firms of burner-makers and gas-stove manufacturers have no exhibits. In spite, however, of the limited scale of the exhibition, one or two novelties are shown which well merit attention. The Lucas incandescent intensive gaslight is exhibited for the first time in this country. This

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lamp has met with great success in Berlin, and emits a white light of such brilliancy, that it is exceedingly conspicuous, although exhibited in close proximity to high-power incandescent gas lamps of the well-known type. The Lucas lamp is supplied with gas under ordinary pressure, and it is stated that with a consumption of 17 cubic feet of gas per hour a 700-c.-p. light is obtained. One of the essential features of the lamp is its chimney, which is about 3 ft. in length, and creates a strong upward current of air around the mantle and flame. Another exhibit which calls for special mention is the inverted incandescent gas lamp. In this lamp the burner is situated above the mantle, and has a cone of white porcelain to act as a radiator and reflector. The mantle is inverted and suspended from the burner, so that when properly shaded, the lamp closely resembles an incandescent electric lamp. It is claimed that this burner gives a light of from forty to fifty candle-power with a gas consumption of 3·4 cubic feet per hour, and although it is therefore less efficient than burners of the usual form, it is considered that this disadvantage is more than counterbalanced by the freedom from shadow and more pleasing appearance of the new lamp. It remains to be proved whether the mantles are as durable when applied to inverted burners as when used on burners of ordinary construction. Other noteworthy exhibits are the new Clamond gas radiators and the Welsbach self-intensifying lamps. A few stalls are devoted to acetylene appliances, but as these exhibits are not shown in action they are not of great interest. The exhibition will close on the 11th proximo.

Metrology.

THE learned paper on the "Applications of Elastic Solids to Metrology," by Dr. Chree, the Superintendent of Kew Observatory, which appears in the *Philosophical Magazine* for this month, is a most valuable contribution to our scientific knowledge. The object of the paper is to exemplify the bearing of elasticity on physical measurements, and the author's unique knowledge of the mathematical theory of elasticity has enabled him to give a complete and systematic treatment of the subject. We are apt to regard a solid as something whose volume alters only with temperature. When, however, we make very accurate physical measurements it has to be remembered that bodies are elastic, and not rigid. Dr. Chree proves that the changes in the volume of the international standard kilogramme made of platinum iridium are appreciable owing to variations in the height of the barometer, and hence a standard pressure ought to be assigned at which a kilogramme has its normal volume. Hence, with the accuracy of measurement they are trying to attain at the National Physical Laboratory, they have to recognise that platinum is an elastic solid whose volume alters with the atmospheric pressure. The author, from the theory of elastic solids, deduces the difference in the volume of a glass tube when it holds mercury and when it holds water, and proves that this difference is very appreciable. Perhaps the most important of his results are those showing how standards of length alter owing to the fact that the bars on which they are marked are not absolutely rigid. Most modern standards of length are supported on two symmetrical rollers, as the bars have to be surrounded by liquid so as to promote uniformity of temperature, and hence the flexure of the bar has to be considered. Dr. Chree proves that the reaction of the supports possesses as yet only theoretical interest, but that the effect of barometric pressure has to be considered. At Kew the standard yard is the distance between the centres of two gold plugs let into a bar so that they lie flush with the upper surface. Dr. Chree gives the mathematical solution of the problem of finding the distances of the supports from the ends of the bar so that the distance between the plugs shall be unaffected by stretching.

Copper-Tin Alloys.

AN important communication on the "Microscopical Examination of the Alloys of Copper and Tin" was made to the Institution of Mechanical Engineers on the 20th inst. by Mr. William Campbell, B.Sc., of Columbia University, New York. The work which led up to the writing of the paper was carried out in the metallurgical laboratory of the Royal School of Mines, and is supplementary to the Reports of the Alloys Research Committee. A number of experiments were detailed, with a view to explain the complete freezing-point curve of the copper-tin alloys published in the fourth Report of that committee; they also throw much light on the change of structure in those alloys due to casting. Perhaps the most interesting and original part of the communication consists in the description of the micro-structure of the alloys. Mr. Campbell finds that when the alloys which contain between 0 and 1 per cent. of copper are cast, the tin crystallises out as grains very much smaller than those of the slowly cooled alloys. The proportion which the grains bear to the entectic is greatly increased by casting, and this seems to point to the fact that in cooling quickly the grains of tin retain some copper. On the other hand, no crystals can be seen in the 1 per cent. alloy when cast, whereas when it is slowly cooled in the furnace they are present. This last principle is not, we may remark, a new discovery, for it has for years been known, in connexion with the cooling of igneous rocks, that de-vitrification, accompanied very frequently by the development of phenocrysts, takes place on slow cooling, whereas the same magma may become vitreous when rapidly cooled. The author states that when from 1 to 8 per cent. of copper is present casting produces a fine network of bright crystallites; the 20 per cent. alloy is composed of bright rod-like crystals which, under a magnification of some 300 diameters, are seen to be composed of two constituents, and the rods increase in size as the copper is increased to 40 per cent. With 41 per cent. of copper the crystals change in character, and become more or less fibrous in appearance. The surface structure of the alloys containing between 80 and 100 per cent. of copper is often very fine, and generally consists of numbers of distinct skeleton crystals which stand out prominently above the surface. The conclusion arrived at is that the result of casting is in all cases to make the structure comparatively minute. These researches by Mr. Campbell mark a distinct advance in metallurgical science, and they have considerable bearing on the subject of bronze-casting in general.

Cass's Charity, Aldgate and Hackney.

IN 1709 Sir John Cass, Alderman of Portsoken Ward, made a will vesting in trustees some lands adjoining his house in Gover-street, South Hackney, together with a capital sum of 1,000*l.*, for the establishment and maintenance of an advanced or higher grade school at Hackney, and a charity school in his native parish of Aldgate. In 1718 he prepared another will that increased the yearly subsidy in favour of the Aldgate school. He did not live, however, to completely execute the later will, for whilst signing the second sheet he died with the pen in his hand. Considerable litigation ensued, and several years elapsed before Lord Chancellor Hardwicke gave judgment in favour of the former will; the Court of Chancery ordered that the income, 493*l.* per annum, of the trust should be expended upon the schools in Aldgate, the funds not being sufficient for the school at Hackney as well. In 1893-4 the Charity Commissioners formulated a scheme for the allocation of the funds of the endowment, which had so increased in value as to yield a yearly income of 6,500*l.*, which, it is computed, will ultimately reach nearly 30,000*l.* as the leases expire. The scheme apportioned a capital sum of 5,000*l.* and a sum of 500*l.* per annum for educational purposes in Hackney out of the surplus endowments at a future time as the property enhances in value, and continued the Cass's School, for 220 boys and girls, with their board and clothing, in Aldgate. The Commissioners further provided for the establishment in Aldgate of a Technical Day School and Institute in Jewry-street, Aldgate, for which Mr. Arthur W. Cooksey's designs and plans were accepted in a competition limited to five architects, Professor Aitchison acting as assessor, in conjunction with Sir Philip Magnus and Dr. Garnett of the Technical Education Board (see the view, section, and plans illustrated in the *Builder* of July 23 1898). In September last Mr. Blashill, as assessor, awarded the first premium in a limited competition to Mr. Cooksey in respect of his plans and designs for the North-East London Polytechnic buildings to be erected near Hackney Downs Railway Station, as part of the Cass foundation. In October a tender for 10,826*l.* was accepted from Messrs. Chessum & Sons, of Bow, contractors, for the new works.

Leeds and Yorkshire Architectural Society.

THE Leeds and Yorkshire Architectural Society, which appears to be making new progress under its present energetic President, Mr. Butler Wilson, has followed the example of the Architectural Association and of some of the leading provincial societies in issuing an annual "Book," to be called "The Green Book," containing information as to the proceedings of the Society, its classes and meetings, its finances, &c. From the first issue of the "Green Book," which we have just received, we learn that the Council report a slight increase in the membership of the Society, which now numbers 119 members, as against 111 at the same date last year. The Report expresses regret that the competition for the Society's prizes was less keen than might be wished; we hope there will be a better record in this

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respect in the future. The prizes offered are a silver medal and five guineas, offered by the President for measured drawings of any ecclesiastical or domestic building erected anterior to 1800 A.D.; the Society's prize of three guineas for the best design for a lodge and entrance gates; the Society's prize of three guineas for the best constructional drawing of a roof for a gymnasium or swimming-bath; and a prize of two guineas for the best essay on "Modern Street Façades in Leeds," illustrated with sketches as far as possible. That ought to be an attractive subject, and Leeds affords plenty of good examples.

Antiquities of Susa.

AT the London Institution on December 19, a lecture on the "Recent Discoveries at Susa" was delivered by Mr. W. St. Chad Boscawen. In Mr. Boscawen's brief summary of the progress of exploration on both banks of the Tigris, he referred to the excellent work of the French explorers, and dealt chiefly with the discoveries of M. De Morgan. The illustrations put on the screen consisted mainly of inscriptions, and as explained and translated by Mr. Boscawen prove the existence of an advanced civilisation much further back than any Babylonian records. In prehistoric times the stone written title-deeds of land grants, and the accounts of miscellaneous traders, show the existence of a perfect system of land survey and valuation and accurate bookkeeping. That certain parts of Elam were laid out in vast wheat-growing areas he claims abundant evidence. The lecturer drew an ingenious, though somewhat unconvincing, analogy from the remains of pottery evidently cast in a basket mould, and concluded that the art of basket-making was prior to that of the potter, and traced the subsequent surface decoration of pottery from this source. Architecturally, the most interesting slide was one of a rough pointed arch, discovered under a lease dated at 4000 B.C. A slide of a fragment of sculpture in low relief, dated 3800 B.C., representing the attack of the Elamites led by their king up the precipitous slopes of their enemies' position, is a piece of marvellously powerful pictorial sculpture.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

THE HISTORY, MANUFACTURE, TESTING, AND USES OF PORTLAND CEMENT.

THE fifth meeting of the session of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, W., on the 20th inst., when a paper, prepared by Mr. H. Howard Humphreys, M.Inst.M.E. (unavoidably absent), was read by Mr. E. Stone Spencer, M.Sc., on "The History, Manufacture, Testing, and Uses of Portland Cement." The chair was occupied by Mr. R. H. Weymouth.

The Chairman said he would like to say how very much Mr. Humphreys regretted that he was unable to be present that night. About ten days ago he was called away on a business engagement to Spain, and he felt he was not justified in putting off an important business engagement, and had, therefore, asked their friend, Mr. Stone Spencer, to take his place. Mr. Spencer had known Mr. Humphreys for many years, and some part of his time worked under him. He was sure they would be glad to have Mr Spencer with them, when he told them he had made a long journey from Liverpool on purpose to read the paper.

Mr. Spencer then read the following paper:—The subject upon which I have the honour of addressing you to-night is one which, although at first sight it appears to be essentially dry, is in reality teeming with interest. Several years ago, when I first began to take special interest in Portland cement, the manager of a large works on the Thames made a remark which I, at the time, thought somewhat extravagant. He said, in effect, that in undertaking the study of this substance, I was embarking upon a study for a lifetime; after a good many years of research, I have, however, come to the conclusion that the remark was entirely justifiable. Cements all seem to possess an individuality which is marked to a far greater extent than is that of any other building material; different samples of this substance which only present what are apparently minute chemical and physical differences, will still act in ways which are often entirely contradictory.

The deep debt which we owe to Portland cement is hardly recognised as widely as it should be. Its invention alone rendered possible many of the extraordinary architectural, and more especially engineering, feats of the past century, and, when properly prepared, its durability far exceeds that of many bricks and building stones. Its present excellence is the outcome of years of patient scientific investigation, and although the names of its inventors and perfecters (who laboured principally during the first half of the nineteenth century) are forgotten, or at best but dimly remembered, the result of their work has revolutionised and assisted design to as great—or, perhaps, greater—an extent than has the introduction of mild steel for constructional purposes.

History.—Generations of constructionists, even before the time of Vitruvius, the celebrated architect for Augustus, had noted with dissatisfaction the difficulty of carrying out hydraulic works, owing to the lack of cementitious material which would set hard under water. Vitruvius himself says that after having laid the cofferdams for bridge foundations, "they kept the same empty for a period of not less than two months, in order to allow the masonry to harden."* We must not infer from this, however, that the Romans did not know something of the composition of hydraulic limes, for such a theory would be entirely contrary to fact; it has been found, for instance, upon examination of many of their mortars, that they recognised the advantages to be obtained by the mixture in their mortars of a certain amount of powdered brick or tile dust or a volcanic substance known as puzzolana. On the other hand, I do not think that we have much to learn from the Romans with respect to the composition of mortars. Vicat said that there was a belief throughout France that the Romans possessed a secret for the fabrication, and I have frequently heard remarks which have shown that a similar idea exists in this country. Analyses, however, of various ancient mortars prove that they possessed a variable composition, which would hardly be the case had a general specification (evolved from a special knowledge) been worked to.

Pliny at a later date (lib. 36) ruthlessly destroys the theory of general excellence of Roman mortars, for he says:—"The greatest cause of the ruins of the town was due to the fact that the cements were fraudulently composed of lime lacking in adhesiveness."† Evidently the building inspectors of Rome had troubles, and it is certain that whatever crimes may be urged against the genus jerry builder, it cannot be said that the race is of mushroom growth, although in this behalf we may even go back to an earlier period, as it is fairly evident from Biblical records that the labours of Joshua and his compatriots were considerably lightened in the case of the collapse of the walls of Jericho, by the circumstantial evidence existing that these structures had been erected by the progenitors of the gentlemen so much in evidence in the suburbs of London.

Throughout the Middle Ages the search for some more durable binding material continued; hydraulic limes were used, and to some extent understood, but the economic difficulties of transit prevented their general adoption, and it was not until the latter half of the eighteenth and the first decade of the nineteenth centuries that real progress was made. As usual, it was a case of necessity proving to be the mother of invention. Smeaton's research work, whilst he was building the Eddystone lighthouse, convinced him that the theories of the ancients were incorrect, and that lime burnt from hard stone did not of necessity give the hardest mortar. He noted also the important fact that many impure limes, which contained a fair amount of clay made an excellent hydraulic cement. Prior to his day it had not been generally recognised that it was an advantage to calcine clay and lime together, and so benefit from the partial chemical combination effected. Smeaton, however, did not turn his knowledge to financial account, and it remained for James Parker,* of Christ Church, in the county of Surrey, to invent and patent a cement in 1796, to which some years afterwards he applied the unfortunate misnomer of "Roman," giving rise to the theory that this material was originally prepared by the invaders of Britain. The deposits from which Roman cement was made varied widely in their composition, the resultant cements differing considerably. After the lapse of a few years Parker began to prepare his material from pebbles found on the Isle of Sheppy, Whitstable, and Harwich. At the same time the name was altered to "Parker's Cement," which was the immediate precursor of the material now so well known.

In the year 1813, Joseph Aspdin, a Leeds bricklayer, succeeded in manufacturing cement from limestone which had been reduced to puddle or powder and clay. He patented this in 1824, and called the substance "Portland Cement," because of its fancied resemblance to Portland stone.† In the year 1825, Aspdin established a manufactory at Wakefield for his cement, and in 1828 Sir Marc Isambard Brunel and his son, Mr. Isambard Kingdom Brunel, are said to have used this material on the Thames Tunnel. Aspdin's cement, after it had been fired, was only in a semi-burnt condition, proper vitrification had not taken place, or if it had taken place, those portions of clinker which approximated to blackness were thrown aside and considered inert, whereas in reality the best material was rejected.

It was, I think, General Pasley who, at a later date, discovered first the value of burning lime and clay to a point of incipient vitrification. James Frost, builder, of Finchley, should also be mentioned as one of the pioneers of the industry, as he in 1825 established himself in cement works at Swanscombe, the site, I believe, being the same as that now used by Messrs. Bazley White & Co. In the year 1830, General Pasley, then Inspector to the Royal Engineers School at Chatham, independently produced a fair hydraulic cement from the Medway clay and chalk, and he appears to have continued his researches for some time. He mentions, in the second edition of his book on the subject (1847), that there were three manufacturers of artificial cements in England who turned out satisfactory materials—Messrs. J. B. White, Swanscombe, Kent (who had taken over Frost's works at that date); Messrs. Evans & Nicholson, of Manchester, who were manufacturing what they called a patent lithic cement; and Richard Greaves, of Stratford-on-Avon, who was preparing blue lias cement. It is fairly certain, however, that General Pasley underestimated the number of manufacturers, Aspdin's Wakefield factory being amongst those omitted.

In the year 1843, Messrs. Grissel & Peto, contractors for the Houses of Parliament, conducted a series of comparative tests between Roman and Portland cements, consisting of

* Relinquatur pila ne minus quam duos menses ut siccescat.

† Ruinarum urbis ea maxima causa quod furto calcis ferrumine suo cæmente componentur.

* Parker's patent provided for the preparation of cement from septaria or nodules present in clay. See Appendix for analysis.

† Aspdin's specification, No. 5,022, is dated October 21, 1824, and is for "An Improvement in the Modes of Producing Artificial Stone," which invention he thus describes:—"My method of making a cement or artificial stone for stuccoing buildings, water works, cisterns, or any other purpose to which it may be applicable (and which I call Portland cement), is as follows:—I take a specific quantity of limestone, such as that generally used for making or repairing roads, after it is reduced to a puddle or powder; but if I cannot procure a sufficient quantity of the above from the roads, I obtain the limestone itself, and I cause the puddle or powder, or the limestone, as the case may be, to be calcined. I then take a specific quantity of argillaceous earth or clay and mix them with water to a state approaching impalpability, either by manuel (*sic*) labour or machinery. After this proceeding I put the above mixture into a slip pan for evaporation, either by the heat of the sun or by submitting it to the action of fire or steam conveyed in flues or pipes under or near the pan, until the water is entirely evaporated. Then I break the said mixture into suitable lumps and calcine them in a furnace similar to a limekiln till the carbonic acid is entirely expelled. The mixture so calcined is to be ground, beat, or rolled to a fine powder, and is then in a fit state for making cement or artificial stone. This powder is to be mixed with a sufficient quantity of water to bring it into the consistency of mortar, and thus applied to the purposes wanted."—Redgrave's "Calcareous Cements."

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the breaking weights borne by brick beams and cantilevers. Their letter to the manufacturers states that they were satisfied that a mortar composed of sand in the proportion of three parts to one of Portland cement was more than double the strength of the Roman mortar, although the latter had only one part of sand. Messrs. Grissel & Peto's experiments advertised the material, and as they used it extensively on the numberless and extensive works of an architectural and engineering nature upon which they were engaged, the demand steadily rose. In the years of the railway mania, 1846-50, prices ran up for all hydraulic cements, so much so, in fact, that Sir Robert Peel, fearing exhaustion of septaria, proposed putting a tax upon it; but Mr. Aspdin interviewed Sir Robert, assuring him that even if the supply of the Harwich stones failed (from which the Roman cement was manufactured), there was a better material on the market, and one which was inexhaustible.

Experiments as to the crushing weights which could be borne by the two rival materials were conducted at Messrs. Bramah's works in 1848, and reported in the *Builder* of September 30 of that year, the results showing most conclusively the superiority of Portland cement.

In the year of the Great Exhibition (1851), experiments for tensile strength were made at that building, and this is the more interesting because it was here that briquettes first appeared. In 1859 the main drainage of London was about to be carried out, and the Board of Works were fortunate in selecting as their engineer Mr. John Grant, M.Inst.C.E., who was the first to take testing in hand in a systematic and scientific manner. His researches were brought before the Institution of Civil Engineers, and attracted so much notice that Roman cement soon became little more than a memory. The discussion on Mr. Grant's various papers not only had the effect of further popularising Portland cement, but immensely improved its manufacture, owing to the free interchange of thought between engineers and manufacturers.

Manufacture.—Present-day Portland cements vary considerably from those prepared under Aspdin's specification, which neither provided for a definite proportion between the limestone and argillaceous matter, nor for the burning of the mechanical mixture to a condition in which true chemical combination had taken place. It is in the careful observance of these two points, however, that one of the principal secrets of excellence in our present cements is found.

There are three principal methods of manufacture, viz.:—

1. Wet process.
2. Semi-dry or Goreham process.
3. Dry process.
4. Rotary process.

1. In the wet process, which is in vogue at some of the Thames and Medway works, chalk and clay are mixed together in definite proportions in a wash-mill, and with an excess of water. The mill consists of a round pit in which there are horizontal revolving arms fitted with vertical "tynes" or teeth by which the chalk and the clay are broken up and their particles reduced to a fine state of division. The resultant mixture called slip or slurry is then elevated to settling reservoirs, where the supernatant water is drawn off, or to drying chambers on top of the kilns, where waste gases from the flues absorb the excess of water. When the slip has been partially dried, it is chopped out in rough blocks, laid in kilns with layers of coke, the latter material being in the proportion of 8 or 9 cwts. to every ton of clinker produced.* The amount of fire required depends very largely, of course, on the quantity of moisture retained in the slip when kilned. There are almost numberless, and most ingenious, varieties of kilns, having for their object the utilisation of as great a proportion as possible of the waste gases from the burning clinker.

The changes effected in the kilns are various, but the main alteration is due to the liberation of the carbonic dioxide from the lime by the intense heat. The lime, deprived of this gas is in such a condition that it will readily enter into chemical combination with silica and alumina of the clay, forming silicates and aluminates of lime; it is upon the correct formation of these chemical compounds that the subsequent success of a cement depends. When the kiln charge has been burnt through, it is drawn, and (in the better class works) the unburnt portions of the slip are picked out by hand for recalcination. The properly formed clinker, which is almost black, but not glassy in appearance, is taken away to crushers, where it is reduced in size prior to being passed through the grinding mills. As in the case of the kilns, there is a very great variety in the design of these mills, but the mechanical details hardly appear to come within the scope of this paper. The final grinding of the cement should reduce the clinker to an exceedingly fine, almost impalpable flour, as other things being equal the commercial value of a cement will be in inverse proportion to the size of its grain. This point, however, I will elaborate later on. After leaving the mill the finished cement passes along a shoot or trough to the store, where it lies more or less exposed to the air until it is bagged up for delivery.

2. The Goreham or Semi-Dry Process is one in which only about one-quarter of the water required in the wet process is used in the wash-mill, but the mixture is further incorporated by passing the resultant slip between horizontal millstones or edge-runners. In my opinion, this system is vastly superior to the wet process, as (taking one point only) the heat required to develop power to work the millstones is nothing like so great as that required to reduce the excessive moisture in the slip prepared by the wet process. The subsequent grinding, &c., of the cement is practically the same as that already described under heading 1.

3. The Dry Process is used in some parts of Wales and in Warwickshire, where the interstratified limestone and shales of lias formation supply the materials for making cement. The raw materials are mixed in proportions varying according to their chemical composition; they are then crushed, ground to powder, mixed with water, and passed through a pair of wet stones, which incorporate the mixture as in the case of the Goreham process. They are then dried, loaded into kilns, burnt, and ground.

4. The Rotary Process of preparing cement* is not yet at work in this country, although it is largely used in the United States. In the first three processes described there are at least two serious drawbacks, due to waste of heat and to imperfect burning. The rotary process of manufacture was invented in this country by Mr. F. Ransome, and carried a stage further towards perfection by Mr. Wilfred Stokes. A difficulty, however, was met with which at the time seemed insurmountable, but the ingenuity of the Americans has overcome the obstacle, and now the process is a commercial success. Perfected machinery is being put in at the Swanscombe Works of Messrs. Bazley White & Co. The process consists in burning the slip in a slightly-inclined revolving cylinder, the feed being at the far end from the burner, which is supplied with injected coal-dust as fuel. The material slowly finds its way down the cylinder, and, at a distance of approximately 10 ft. from the burner, the sintering begins. When the clinker drops from the first cylinder it is said to be thoroughly vitrified, and entirely uniform in quality. The clinker then goes to a second inclined cylinder, where it heats the air passing to the coal-dust burner. After leaving the second cylinder the clinker passes through crushing rolls, which are sprayed with water, and which reduces the coarser lumps before the material passes into the third cylinder, where it is further cooled and pulverised prior to dropping into the trucks which take it to the grinding-mill. It is stated that the damping in the rolls has a beneficial effect upon the resultant cement, and that the material prepared by this process requires little subsequent aeration. The cost of production is said to be approximately three-fourths of that of the cheapest process in vogue on the River Thames and Medway, and the output is very largely increased. The experiment will be watched in this country with great interest, but one may reasonably expect it will be a success, as Americans do not, in an ordinary way, take up a method of manufacture which will not give a good return on their initial expenditure.

Testing.—Amongst the materials of construction, cement occupies an unique position, as it arrives in the raw state—that is to say, it is unfit to go through the various processes of testing without further individual preparation, which is bound to introduce the personal equation to a greater or less extent. Moreover, there is a very wide divergence of opinion as to what the "further preparation" should consist of. In the early days of cement manufacture the tests were of a very rough and ready character. General Pasley's experiments were eminently practical, for he cemented bricks together and ascertained the tractive force required to draw them apart. Messrs. Grissel & Peto's tests, together with those of Messrs. Bramah and the ones made at the Great Exhibition in 1851, have already been mentioned. With the exception of Bramah's, they were all more or less crude, and it seems to have been left to Mr. Grant to make a further series of trials in 1866. One of these experiments was carried out with the object of ascertaining what the effect of shape of moulds was upon the tensile strength of briquettes. Mr. Grant tried ten different shaped moulds, and, after an interval of thirty days, he discovered that briquettes made from the same samples of cement, and under the same conditions, varied in the tensile stress they bore between 512 lbs. and 328 lbs. on the square inch, or in the proportion of 1 to 0·64, a result somewhat startling and quite sufficient to induce an attempt to obtain uniformity in the pattern of moulds. Makers of testing machines were soon in hot competition, and it was but natural that they introduced, not only what they considered improvements in machines, but improvements in the form of moulds. Comparison of tensile tests made by different experts in different shaped moulds became practically an impossibility on this ground alone. But the trouble in connexion with neat cement tests did not end with difference in the shape of moulds, and, in considering this point, it is necessary to have a clear conception of what are the real objects of cement testing. Amplifying Professor Unwin's conditions, I consider it essential (1) that a cement shall harden with reasonable rapidity under water; (2) That it shall remain constant in volume, except so far as unavoidable atmospheric changes cause expansion and contraction; and (3) That it shall develop considerable powers both of adhesion and cohesion. It is the duty of the expert to forecast the future condition of the cement he is testing. No. 1 does not require any very great experience to ascertain, but Nos. 2 and 3 present problems of considerable difficulty. The general tendency during the last twenty years has been in the direction of reducing the period of time allowed for the making of cement tests. This unfortunate hurry to make haste, coupled with the fact that architects and engineers have contemporaneously insisted on higher tensile results over the seven days' period, has caused considerable trouble, as it has often led makers to over-lime their cement, that is to say, to use this substance considerably in excess of that required to enter into proper chemical combination with the silica and alumina of the clay. By this means they have been able to procure a much higher seven days' breaking stress, but at the expense of the subsequent constancy of volume of the cement. I do not think that some users of cement have yet quite grasped how essential "constancy of volume" is, otherwise I am sure that far less stress would be laid upon tensile strength in specifications, and more attention would be given to the production of a material which would neither expand nor contract with the lapse of time. The seven days' tensile test (although it is a point which a large number of architects and engineers consider more than any other in an expert's report) is absolutely no guide *by itself* as to the future behaviour of a cement in work. This is true, even on the assumption that all experts made their tests in the same kinds of moulds under the same conditions of heat and cold, with equal proportions of water, and with the same degree of pressure in making the briquette. But the unreliability of this test is further increased by the fact that there is no general agreement upon public works (or amongst experts) as to the methods to be employed in manipulating the cement for tensile test. It is the easiest thing in the world for two different men to get a tensile result on a good cement varying anywhere between the limits of 350 lbs. and 600 lbs. per square inch in seven days. In a recent

* One ton of clinker roughly = 1½ tons of dry raw materials, which will be in the approximate ratio of 1⅛ tons of chalk to ⅜ ton of clay.

* Described in detail by Messrs. Stanger and Blount in a paper read before the Institution of Civil Engineers recently.

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number of the *Contract Journal* I gave the following list of causes for divergent results :—

I.—*Due to Different Types of Machines and Moulds.*

A. The form and hanging of clips in which the briquette is held.
B. The distance of the point of application of the strain with reference to the minimum section of the stress.
C. The shape of briquette.

II.—*Due to the Cement itself.*

D. The age of the cement after grinding.
E. The fineness.

III.—*Due to the Operator and Testing-room.*

F. Amount of water used.
G. The temperature of water used for mixing and immersion.
H. The method of filling moulds.
I. The rate of mixing and trowelling.
J. The rate at which stress is applied to the briquette.

I have experimented upon the whole of these points, and have ascertained the variations as stated ; but Mr. R. W. Leslie, of the American Society of Civil Engineers, goes much further than I do, as he says that there are no less than thirty-six causes having a distinct and definite influence upon the tensile strength. My modest list, however, will perhaps convince you that if you go to one expert, and he tells you that the sample of cement you have submitted to him only bears a stress of 350 lbs., and you then go to another expert who makes the breaking weight 500 lbs., you will have no common basis for forming a definite opinion as to the value of the cement, unless you also know precisely the conditions under which each expert carried out his experiments. I say, and say deliberately, that architects and engineers who trust to a seven days' tensile test alone, whether the briquettes are made by themselves or by experts, are living in a fool's paradise. To be able to place reliance on this test it should extend over a far longer period, and over such a period that, in the majority of cases, considerable inconvenience would be caused by delay in work. I give in the appendix the results of some experiments which I have made from very excellent cement supplied by Messrs. I. C. Johnson, of Greenhithe. The result of these tests shows that at the end of a period of seven days—

1. Briquettes made with hot—that is, unaërated—cement gave a considerably higher result than when the cement had been weathered and was in a condition for use.

2. That the effect of ramming the cement into the moulds increased the tensile strength by 136 lbs. on the square inch over that obtained by making the briquettes by thumb pressure only, which latter, I always maintain, is the correct method of making same.

3. That the flour of cement (*i.e.*, the most valuable portion) having been passed through a 30,000 mesh to the square inch sieve, and separated from the more coarsely ground particles, gave 145 lbs less tensile strength than did the unsifted cement.

4. That the large section briquettes—that is, 1½ in. by 1½ in. (2¼ sq. in.)—did not attain nearly the same strength per square inch in seven days as did the 1 square inch sections.

The most startling and paradoxical of these results is that which shows that fineness of grinding reduces the neat tensile strength, whereas it immensely increases its covering capacity and adhesion to sand or other aggregate. If one were to judge by tensile test alone, it would be quite possible, and even probable, that a material high in cementitious value would be rejected in favour of one which contained possibly 6 cwts. per ton of improperly ground clinker, which has little, if any, more value than so much sand.

You will, I feel sure, forgive me if I have laboured this point somewhat, but several years of experience have taught me to place little, if any, reliance upon the neat short-time test. In conversation with the manager of one of the oldest and best works on the Thames recently, I found that he had come to precisely the same opinion as myself. If I appear to you to be playing the rôle of iconoclast, I feel that there is abundant reason for assuming this character. Far be it from me to say that the neat tensile test has no value. It has, if the time given by the architects and engineers is lengthened to one, two, or three months, but this is generally impossible in an age of feverish activity, and therefore we must look to other tests to ensure our obtaining a material which shall be safe. These tests are—1. Physical ; 2. Chemical.

I.—*Physical.*

A. Constancy of volume.
B. Fineness of grinding.
C. Degree of aëration.
D. Specific gravity.

Dealing first, then, with constancy of volume, I hold that tests made with the object of discovering whether a cement has, concealed within itself, elements sufficient for its own subsequent disintegration are the most important that can be performed. You are all familiar with the "blowing" of cement work, and this is the way in which *inconstancy* of volume generally shows itself. There are a number of causes, some of which I need not trouble you with, but the one which occurs most frequently is due to an excess of free or loosely-combined lime in a cement. The fact that cements should be cooled by being brought into contact with air prior to use is widely known ; the free or loosely-combined particles of lime which are present in every cement (however good) are slaked by this means, and their expansion takes place by the absorption of moisture from the air in very much the same way that ordinary lime is slaked by the addition of water. If a cement is slightly under-burnt and finely ground, the process of aëration is comparatively easy, but when a sample is hard-burnt and coarsely ground, the process is much more difficult, as the air will not reach the lime which is concealed, and which reposes in a metamorphic condition in the interior of the coarsely-ground particles. Obviously, then, the best way to provide against subsequent expansion is to have the substance ground as finely as possible, so that the air may play upon and hydrate the whole of the molecules. I have myself seen some remarkable instances of self-contained disruptive forces in a cement, destroying the stability of an entire structure. One instance occurs to me where a large railway viaduct, carrying four lines of way, and costing approximately 30,000*l.*, was badly damaged by the use of a cement which contained free lime, and which, after having been tested by the ordinary orthodox seven days' tensile test, had been passed as satisfactory.

In the case of concrete floors, the dangers are exceedingly great, as the floors are often practically monoliths without any room for expansion. I had some time since to report upon the disturbance of a building which, when erected, measured 16 ft. between walls. It had a concrete floor, which expanded and pushed the walls out 3 in. The invention of a clever little contrivance by the chief assistant of my Association (Mr. Harold Claxton) has enabled me to give you in the appendix one or two measurements as to the expansion of a hot, though excellent, material. All cements before use should be carefully shot into thin layers, turned over, and should not be put into work until the heat developed after mixing with 20 per cent. of its weight of water does not exceed 6 deg. in one hour. The whole of the tests carried out in the laboratory of the Association I represent are made under these conditions, and I am in thorough agreement with the system.

In regard to specific gravity, in many of the older specifications (and, unfortunately, in some of those still used), one finds that weight per "striked bushel" is retained ; this is generally given at "not less than 112 lbs." Sometimes it is added that a cement shall be filled into the bushel measure from hopper spout 18 in. above the cement ; but upon consideration it will, I think, be quite obvious that even under the last-named and best condition, a striked bushel is an exceedingly vague and thoroughly unscientific term. "Specific gravity" is fortunately rapidly taking the place of "weight per bushel" as a check upon burning, &c., and it is probably the best measure that we can have of density of the material ; but if two tests for specific gravity are made upon the same cement which has undergone different periods of aëration, the results will not compare. Freshly-ground clinker will show a specific gravity of about 3·15, whereas after the hydration of the lime has been effected, and the cement is ready for use, I have frequently found that not more than 3·06 to 3·08 is obtainable. In comparing, therefore, the reports of two experts upon the same sample, it is also essential in this test to know the conditions as to heat when the experiments were carried out.

II. *Chemical.*—The chemical portion of a report will not by itself prove to be a sufficient guide as to the quality of the substance, but taken in conjunction with the physical tests it is almost invaluable, as it not only gives a check upon the physical report, but it renders possible the explanation of many points which otherwise would be difficult to interpret. It materially assists in detecting adulterations, and, if properly done, is a good guide as to the probabilities of a cement attaining great tensile strength with a lapse of time. The chief points to be looked for in the analysis are :—

1. Proportions of soluble silica and alumina to lime.
2. Proportion of magnesia.
3. Proportion of sulphuric acid.

As I have stated before, it is upon the proper chemical combination of silica and alumina with lime that the success of a Portland cement depends.

In an article in the *Builder* of October 5, 1901, I said that

"Dr. Spencer Newberry, after a considerable number of experiments, found that the limits of the molecules of lime to those of the soluble silica in the clay is as 3 to 1, and in the same way the proportion of lime to alumina should not exceed 2 to 1. Substituting atomic weight for these proportions, this will represent in weight 2·8 parts of lime to combine with 1 part of silica and 1·1 of lime to combine with 1 part of alumina Supposing that these proportions are departed from to an appreciable extent, it will then be seen that the best compounds, namely, a tri-silicate and bi-aluminate, will not be obtained, as there will either be a surplus of imperfectly combined lime present in the cement, or silica and alumina will be in excess."

Magnesia is hardly ever present to a harmful extent in Thames or Medway cements, but it occasionally appears to bulk large in the material made in the Midlands. Its action is subtle, and the last word has by no means yet been said upon its effects. It is generally thought, however—and there is, I think, good ground for this belief—that if present in proportions exceeding 3 per cent., magnesia may cause expansion after the lapse of a considerable time. I myself put the safe proportion at a considerably lower figure than 3 per cent.

The sulphur compounds are principally derived from coke. Sulphur compounds used for the purposes of burning the slip, and the amounts obtained from this source are not likely to have any very serious effects. Of late years, owing to the demand for finer grinding and the consequent necessity for otherwise giving a cement greater time to weather, it has been the custom to add small amounts of sulphate of lime, or as it is more generally known, gypsum, to the fresh cement ; curiously enough, this compound has the property of somewhat retarding the setting. I have carried out several experiments, but have not yet arrived at a definite conclusion with regard to the ultimate effects of the sulphate. In the meantime, however, when asked for an opinion I invariably advise the exclusion of gypsum, as I consider that the same results can be obtained if a little extra time and care be given to aëration, and this latter course is, at least, absolutely safe. I have found that 2 per cent. of gypsum will certainly not be a sufficient quantity to so retard the setting of the finely-ground cements as to do away with all necessity for subsequent aëration. I have further found that upon supplementing the work of the gypsum by spreading out the cement and aërating it, the effect of the gypsum, as a retarding influence, rapidly disappears. You may ask now what course I should suggest in testing a cement over a period of seven days. First and foremost, I place great confidence in the Michaelis boiling test, which requires a mixture of neat cement to be made up with about 20 per cent. of water, set in damp air for twenty-four hours, and immersed in cold water raised to a boiling heat, and maintained at that temperature for three hours. I am fully aware that this test is severe, but for important works I do not think it is at all too stringent, and I have never once known a case of failure in work where a pat had passed through the boiling ordeal without signs of radial cracking. If a cement is slightly coarse, this boiling test will find out and expand any free or loosely-combined lime which may exist within the larger particles, and I do not, therefore, think that anything short of this will suffice. Cements with low tensile strengths will not stand this test, and will frequently boil away entirely. The fineness of grinding should, I think, always be ascertained, but I

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consider that fineness on sieves having fewer than 5,600 divisions to a square inch can very well be omitted. I do not believe that the portions of a cement which are retained on a 14,400 mesh sieve are of any great cementitious value, and the only reason which leads me to recommend the retention of the 5,600 sifting is so that if the rejected particles upon this sieve are very large in size, the severity of the Michaelis test may be increased in order thoroughly to penetrate the larger pieces of clinker. With reference to the tensile test, I should much prefer to substitute for the neat test a test upon standard sand. I have already explained that *adhesion and cohesion are not interchangeable terms*, and that the mere fact that a cement has a high neat tensile strength is not sufficient to prove that it will develop a great power of adhesion to foreign substances; but it is the power of adhesion that one really wants to test. It may be urged, on the other hand, that in testing with standard, or Leighton Buzzard sand, one is not obtaining a measure of the strength of one's mortar if such standard sand is not used upon the actual work for which the tests are made. This is undoubtedly true, but the neat test does not give any advantages in this direction, and by employing the sand test the possibility of rejecting a finely-ground material with a low neat strength in favour of a coarser cement would be eliminated. I give in the appendix a type specification which I hope may be of some service to members of this Association. It is, of course, prepared for high-class work only, on the assumption that architects are drawing their specifications with the main object of providing thoroughly durable work for their clients.

The Using of Portland Cement.

Under the heading of "Testing," I have laid great stress upon the necessity for properly aërating this material, but I think I should here add a word of caution with reference to exposing cements for too long periods prior to use. If there is any feeling of hard knobs in a bin of cement, the same should be carefully screened out, as so much moisture has then been absorbed from the air that chemical action has commenced, and this when once started prevents the nodules (even though reduced to powder) from setting a second time. Under some circumstances, notably in carrying out tide work, it is necessary to use a fairly rapidly setting cement. In putting in pier foundations some years ago, I succeeded in obtaining quick setting by other and, I think, safer means. The whole of the cement was first thoroughly aërated, and a small quantity of furnace ash was mixed in with the stone aggregate; the whole of the concrete was then mixed with fresh water through which a steam hose had played for a few minutes. The surface of the concrete was subsequently protected by ordinary sacking weighted down with iron joists or rails. By these means I was able to obtain a thoroughly sound, homogeneous, and quick-setting concrete; but there are circumstances where it is impossible to carry out this method, and consequently moderately quick-setting cements must be used in order to prevent the washing away of the concrete surfaces. In tide work fresh water should always be used for mixing in preference to salt, as, although salt water does not affect the strength of the material in the long run, it materially retards the immediate setting. For ordinary work in foundations or where hydraulic properties are essential, a slow setting cement gives the best ultimate results.

Aggregates.—First, for concrete. The most suitable aggregates for concrete are (A) hard broken stone mixed with sufficient clean, sharp sand to completely fill the voids (roughly about 40 per cent. of the total volume), or mixtures of broken stone, thoroughly vitrified furnace clinker and sand; (B) gravel with sand and hard broken bricks; (C) gravel and sand.

The advantages of broken stone over rounded material must be fairly obvious. Broken stone is generally clean, having jagged fractures forming an excellent key for the cement, and the volume of the interstices to be filled with sand and small stones is less than in the case with gravel. The addition of furnace clinker adds considerable toughness, providing it is thoroughly burnt and free from small dust. Granite is sometimes used, but more frequently various kinds of hard limestone. I always consider that the finest specimen of concrete that I have ever seen was made from the Kiama blue stone and estuary sand of the river Hawkesbury, in New South Wales. This concrete was used for the piers of the bridge spanning the river at Peat's Ferry. These piers below high water line were practically monoliths, the smallest of them measuring approximately 100 ft. in height, whilst the deepest was 160 ft. The concrete set so hard that it was practically impenetrable, and no sign of weathering has, to the best of my belief, ever occurred. Round stone, that has been water-worn, is not a good material, especially where the concrete has to bear transverse strains. If gravel *must* be used, I always consider that it is a great advantage to use hard broken brick (preferably well-burnt stocks or broken burrs) in conjunction with the gravel, as a certain amount of cohesion is thereby added to the mass which would otherwise be entirely lacking. Burnt ballast concrete is to my mind the worst of any; it is impossible to obtain a thoroughly vitrified class of ballast until the cores of the ballast heaps are reached. The outsides are entirely unsuitable for use in damp positions, as the baked clay is readily acted upon by the moisture, and gradually returns once more to its original condition. In making concrete too much attention cannot be given to the careful mixing of the cement and aggregates. I think that the fewest possible number of times of turning is four—that is to say, the material should be incorporated, twice dried and twice wet, the water being added through the rose of a water-can, so that the cement may not be washed off the stone; no water should, in my opinion, be added on the fourth turning. There has been much discussion as to the advantage or otherwise of dropping concrete into foundation pits from a considerable height. I am entirely opposed to this course, as I have noticed again and again that in course of falling the lighter and finer particles are left behind owing to greater proportionate atmospheric resistance, and the larger stone descends through the partially-set substrata disturbing chemical action and forcing the lighter portions to the top, causing lines of weakness. I do not think such concrete is ever thoroughly homogeneous. What is true of dropping concrete into deep foundation pits in the dry is even more true in the case of placing the material in water, as the evil of buoying up the lighter particles is accentuated in the case of passage through liquids, and I remember that in constructing the foundations for the bridge I have before mentioned we lowered every yard of concrete in an automatic opening hopper. Ramming has, to some extent, the same action as dumping from a height, and is by no manner of means an unmixed blessing, although it is claimed by some that it is absolutely essential if a concrete is to be made water-tight. I demur entirely to this view, as I believe that by the careful proportioning of the materials a water-tight concrete can be obtained without ramming.

Coming to the question of cement mortars, the same general principle which obtains in the case of concretes applies here also; that is to say, the cleaner and more angular the aggregate, the better will be the resultant compo. Sand should not have the whole of its particles of one size; there should be a small percentage of the finer granulations so that the volume of the interstices may be thoroughly filled. Remarkably good results can be obtained from hard furnace clinker ground in a mortar-mill by itself, and subsequently mixed with the cement. One of the great practical difficulties which is met with upon public works is getting bricklayers or concreters to mix materials in small quantities just sufficient for immediate use. If large volumes are mixed at one time they can only be prevented from setting by the addition of excessive quantities of water, and this will have a most harmful effect upon the cement work for all time, as proper crystallisation will never take place. If small quantities are used and mixed with just enough water to make them plastic and workable, a first-class compo is obtained. It should be remembered that chemical action begins with a cement as soon as water is added, and I am not of opinion that this action is delayed by the addition of sand or other aggregate. It follows, therefore, that cement concrete or mortar which has partially set should be thrown upon one side. There are two other points which require care; these are the protection of cement work from frost, and from sun and wind when initial setting is in progress. I believe that as bad effects are caused by the sun as by frost; the latter expands the materials, and so disintegrates them, and the former robs the mixture of the water requisite for crystallisation. Work carried out under conditions of extreme cold should be protected by sacking, and the water used should be warm; or if the work is in the nature of paving, an inch of sand spread over the surface will effectually prevent any but excessive frosts from disturbing the concrete. In the case of heat, it is a great advantage to keep the face of work watered and to cover it up with damp sacking. A further danger exists in using bricks which effloresce to a considerable extent, as a film of dust is formed on the beds which prevents thorough adhesion. I know of at least one disastrous failure due to this cause.

The use of concrete in connexion with expanded metal or with iron or steel rods has, I believe, a great future before it, as the additional strength obtained by the introduction of the metal is vastly in excess of what mere theory would lead us to expect. In Germany and France and in the United States this class of work is frequently met with, but up to the present time no very large amount has been carried out in this somewhat conservative country. It is bound to come, however, and, considering the condition of what is generally called the "skilled" labour market, it will be well if some substance (which it is possible to make by unskilled labour) can be substituted for brickwork, as we may then hear that bricklayers are once more pleased to lay more than 400 or 500 bricks per diem. There may be a drawback, however, in using this armoured concrete, for unless the iron or steel rods, joists, &c., are thoroughly protected, they will rust with great rapidity, and not only will their own strength rapidly disappear, but in addition to this the expansion of the metal in process of oxidation will cause disruptive forces to be set up in the heart of the work. I recently examined a concrete and rolled iron joist roof, the whole of which was protected by cement rendering; portions of the rendering had perished, but even in places where the concrete was absolutely watertight, the joists had rusted to such an extent in eight years, that upon calculation I found that the flanges were exactly half of their original scantling, and, to make matters worse, the oxidation was most marked upon the flanges and not upon the web, where the waste could have occurred with fewest bad results. I am certain that unless proper protection is given to the steel parts of many of the buildings which are now being erected, there will be trouble in the near future, owing to the causes which I have mentioned. Personal experience has led me to the conclusion that the best coating material which can be used on iron or steel is a mixture similar to Dr. Angus Smith's solution, but containing pitch and a certain amount of sand. This mixture, if applied hot, forms a tough, intensely adhesive skin which will stand a reasonable amount of knocking about. Joists look better painted, but I hardly think that appearances should be studied in matters of this kind.

In conclusion, I would draw your attention to a few results obtained by colouring samples of cement with a small percentage of lamp-black, red oxide, and ultramarine, as you may at some time find it advantageous to incorporate colouring matter with the cement. Should you, however, decide to apply paint to cement work, I believe that one of the best preliminary preparations is a solution of 1 part of good sulphuric acid in 100 parts of water freely applied to the surface of the work after the same has thoroughly set.

I must apologise for the abnormal length of this paper. The only excuse that I can offer is that the subject is one of intense interest to me and of immense and growing importance to those who are engaged upon constructional works. I trust, therefore, that I have not wearied you, and that you may not feel like the old Scotch lady who was seen hurrying away somewhat early from church, and who, on being asked whether the clergyman had finished his sermon, replied, "He's dune lang syne, but he winna' stop!"

Appendix I.

Analyses of Septaria used for making Parker's or Roman cement. Authority, R.E. Lectures, Chatham:—

Silicic Acid	12·0
Potash	Trace

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Lime	35·0
Alumina	9·0
Peroxide of Iron	3·4
Carbonic Acid	29·0
Magnesia	1·5
Water	10 0
	99·9

Warwickshire raw material. Authority, D. B. Butler, A.M.Inst.C E, "Portland Cement." p. 21 :—

Lias Stone.		*Lias Shale.*	
Silica	8·73	Organic Matter	3·72
Alumina & Oxide of Iron	8·78	Silica	30·05
Lime	43·95	Alumina	10 70
Magnesia	1·87	Oxide of Iron	3·30
Sulphuric Acid	·74	Lime	26·80
Alkalies	Trace.	Magnesia	3·68
Carbonic Acid	36·20	Sulphuric Acid	1·43
	100·27	Carbonic Acid	20·08
		Potash	·19
		Soda	·13
			100·08

Medway Mud from Gillingham. Authority. C. Spackman, F.C.S. :—

Silica	38·413	As sand in an extremely fine state of division.
Alumina with trace of Iron	1·856	
Silica	25·249	As hydrated silicates.
Alumina	14·244	
Ferric Oxide	6·744	
Lime	·810	
Magnesia	1·727	
Potash	2·957	
Soda	·773	
Water	3 384	
Iron Pyrites	·214	

Medway Chalk.—This substance commonly contains 92-94 per cent. of pure carbonate of lime, with very small amounts of silica and alumina.

Analysis of Messrs. I. C. Johnston's cement used for experimental purposes in connexion with this paper :—

Moisture	0·37
Alumina	7·35
Insoluble Matter	2 37
Combined Water and Organic Matter	0 95
Ferric Oxide	3·47
Sulphuric Acid	1·25
Magnesia	0 99
Carbonic Dioxide	0·93
Lime	60 39
Soluble Silica	21·41
Undetermined	0·52
	100·00

Expansion of New Cement. — A first-class cement, mixed with 20 per cent. water, expanded on mixing ⅛ in. per 100 in. in one day and ¼ in. per 100 in. in seven days, or at the rate of 1 in. in 33 ft. 4 in.

Appendix II.

EXPERIMENTS SHOWING UNRELIABILITY OF SHORT TIME TENSILE TESTS ALONE.

The effect of making briquettes with hot cement—

	Average ultimate tensile stress in lbs. per square inch after 7 days.
Briquettes made with cement of maximum rise of temperature of 14 deg. Fahr.	473
Briquettes made with same cement cooled to 6 deg. Fahr.	449
The effect of ramming cement in moulds—	
Briquettes made by ramming cement in moulds	586
Briquettes made by pressing cement into moulds with thumbs in usual way adopted by Cement Users' Testing Association	450
The effect of fineness of grinding—	
Briquettes made with unsifted cement (residue on 14,400 mesh = 14·84 per cent.)	449
Briquettes made with same cement after it was passed through 36,000 mesh sieve	304
Briquettes made with residues left on 14,400 sieve	50
The effect of various sectional areas—	Per 7 days.
Briquettes of 2¼ square inches cross section	306
Briquettes of 1 square inch cross section	448

Appendix III.

SAND TESTS.

For these experiments the sands used were passed through a 20-mesh sieve and retained on a 30 mesh. Ten per cent of water. Sand to cement as 2 to 1 :—

	Ultimate tensile stress after two months. lbs. per sq. in. Unwashed.	Washed.
Sand from Newbury	430·2 ...	430 2
Sand from Nuneaton	265 ...	320
Sea sand	307 ...	308
Furnace clinker	320 ...	325
Standard Sand	267 ...	261
Granite dust from Rugby	361 ...	356
Granite dust from Nuneaton	350 ...	351

Effect of partial setting of cement mortar prior to use. Briquettes made with cement, and standard sand and cement, as 2 to 1 :—

	Ultimate tensile stress after two months.
Mixed one hour before putting into moulds	83
Put into moulds at once	220

The effect of colouring matters. Briquettes made with cement and standard sand 2 to 1 :—

	Ultimate tensile stress after two months. lbs. per sq. in.
Coloured with 5 per cent. ultramarine	304·5
Coloured with 7·5 per cent. oxide of iron	325
Coloured with 4 per cent. lamp black	280·5
Uncoloured cement mortar	276

Appendix IV.

TYPE SPECIFICATION FOR IMPORTANT WORKS.

Fineness of Grinding.—The cement shall be prepared from thoroughly burnt clinker only, without any admixture of under-burnt portions or other substances. Not more than 5 per cent. residue shall remain on a sieve of 5,000 meshes, and 12 per cent. on a sieve of 14,400 meshes to the square inch.

Specific Gravity.—The cement when freshly burnt shall have a specific gravity of not less than 3·15 or 3·08 when weathered to 6 deg.

Chemical Analysis.—A sample shall not contain more than 1½ per cent. magnesia, 1½ per cent. sulphuric acid, 1 per cent. carbonic acid, or 1 per cent. insoluble residue, and shall not contain more than 62 per cent. nor less than 58 per cent. of lime.

Tensile Tests.—Test blocks of not less than 1 sq. in. cross section shall be made with 20 per cent. of water after the cement has been weathered, and the mixture shall be placed in a mould without ramming and kept one day in a moist atmosphere of a temperature not less than 50 deg. Fahr., and shall afterwards be placed in water of temperature not less than 55 deg. Fahr.

Some of the blocks shall be made of neat cement, and some of 1 part cement with 3 parts by weight of standard dry sand; the latter shall have 10 per cent. of water only. The neat cement blocks shall bear a stress per square inch of 400 lbs. after seven days, 500 lbs. after fourteen days, and 600 lbs. after twenty-eight days.

The cement and sand blocks shall bear a stress per square inch of 100 lbs. after seven days, 150 lbs. after fourteen days, 200 lbs. after twenty-eight days.

Slabs or cakes shall be made with 20 per cent. of water and shall be kept in air for twenty-four hours; afterwards they shall be immersed in cold water and raised to boiling heat, and maintained at this temperature for three hours. No signs of warping, checking, or radial cracking shall show on them.

A pat made with 20 per cent. water shall not take less than three hours to harden, and not more than seven hours.

All cement shall show a uniform growth of strength.

Adhesive Test.—A pat of cement 3 in. diameter and ½ in. thick shall, after the expiration of seven days, adhere firmly to the natural surface of a Welsh slate; the slate to be soaked in water prior to the application of the cement and to be kept moist during the interval.

Heating.—A sample of the cement shall be made into a paste, and if the rise of temperature be more than 6 deg. Fahr. during an hour after mixing, the cement shall not be considered ready for use nor for testing.

Expansion.—The cement shall be shot on to a perfectly dry floor in a watertight shed near the site of the works and to a depth not greater than 1 ft.; it shall be permitted to remain as long as the architect shall direct, and shall be turned over from time to time as the architect shall direct.

The Chairman said he was sure they were very grateful to Mr. Spencer for reading the paper. They would have noted he hinted that experiments had been specially made for the meeting, and if Mr. Humphreys had been there they would no doubt have heard that for the last three months he had been making experiments so as to bring his paper as much as possible up to date. He thought they might take it that they had really got the latest information on the subject from one who was undoubtedly an expert.

Mr. Max Clarke said the first thing they had to do was to thank Mr. Humphreys for taking such an immense amount of trouble with his paper, and they also had to thank Mr. Spencer for reading it in the absence of Mr. Humphreys. He (the speaker) would only say that they had, he supposed, selected him to the martyrdom of opening that discussion just for the same reason that cement had taken it upon itself in the last two years or so to make a martyr of him. For about that period he had been building some very extensive buildings of one kind and another. He commenced by acquiring a cement-testing machine, and he made some experiments, and when he produced the result of those experiments to the cement manufacturers they laughed at him, ahd they said, "You should go to some proper man." So he (Mr. Max Clarke) went to a proper man, and he got a report in due course. But what appeared to him to be the great difficulty as regarded the work was that he was provided with cement which set, so his expert said, in five minutes. That had been going on for about three years, in which time he had sent tons away; altogether, he should say, he had sent 350 tons of cement away absolutely, in barges containing 60 or 80 tons per barge. He had got rid of it because it was totally impossible for the bricklayer who set his 500 or 600 bricks a day to use it quick enough; it would not be set. He was told by their expert and, of course, by Mr. Humphreys that he was to expose it to the air and to aërate it, but he thought they ought, if possible, to acquire some practical details, and he would suggest that when they were drawing a specification, not only should they put in it that they were to obtain the cement aërated, but also a stipulation that if it did not come in aërated the builder or contractor might take upon himself the aërating. He had 80 tons of cement come in to him last week, and he had a report one day this week, and for the first time he had compelled the builder to turn it out because it set in less than five minutes. He had the manufacturer up at his office, and he said, "It is a great pity you have not some of that cement here now." He (the speaker) replied, "Yes, I have; here is the other half of that which I sent to the expert." It was produced, and the manufacturer set to work, and they had a pat of cement tested and that pat took about one hour and three-quarters to set. After he went away they had a little private experiment of their own in the office, adding a less proportion of water but still sufficient, and their cement had set hard a long time before that which was made up by the manufacturer. Those were the sort of difficulties they had got to contend with. He would have been pleased to have heard something about the aggregate which Mr. Humphreys would propose for floors. Of course, that was one of the great difficulties that any one who built largely in the factory way or anything in the public building way had to contend with. It had been more impressed upon him lately by seeing at a meeting the other day drawings of a large school building, and on the top there was a large playground with a brick parapet 7 ft. high. The brick parapet was cracked in many directions very considerably, and from the level of the first floor to the level of these playgrounds the walls were pushed outwards about 7½ in., and in some portions of the school horizontal cracks had developed immediately under the concrete floor or roof. That might have been explained, perhaps, if it had occurred immediately after, or somewhat immediately after, the place was built; but the cracks did not develop in the building either vertically or horizontally until more than a year after the school was finished. One or two items in the paper struck him as being, perhaps, the reason which would account for that peculiarity, but it was not a pleasant thing to know that a year after one had left a building, and received his commission, and gone away perfectly happy, that something might happen which might make things very unpleasant. He noticed that Mr. Humphreys recommended a mortar mill, but two or three sentences further on they were told not to mix up the cement in large quantities. There were two things about the mortar mill, and one was that it was the very worst invention that was ever produced for any man that wanted to do good work, because all sorts of things could go into it, and they were concealed in a very

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rapid manner; the second objection was that you could not manufacture properly a very small quantity of mortar in a mortar mill, and, therefore, it was very objectionable from that point of view. Therefore, if they took his advice they would not use a mortar mill in making mortar in which cement was used. There were two or three points upon which he did not seem to be quite clear, and first he would like to know whether he heard aright that cement was not delayed in setting by adding sand. It might be said that it was a difficult question for them to talk about, and that it was one for the experts; but he looked at the matter from a different point of view. He wanted the best material which would stick his bricks together, and he certainly thought that when he added mortar to the cement he made it set slower. Another point he did not feel certain about was as to joists rusting when they were completely surrounded with Portland cement. He himself had taken iron joists which had been in concrete floors for more than ten years—and not only had he seen them taken out, but he had seen them put in — and they were just as good the day they were taken out as the day they were put in; there was not one single particle of rust on them. He had always been under the impression that it was rather a disadvantage than otherwise to paint joists if they were to be completely embedded in concrete, but, of course, one had to see that they were completely embedded. Then he would like some information about the use of coke breeze. He had the unfortunate privilege of being one of the members who had got to do with the British Fire Prevention Committee, and they had definitely made up their minds that coke breeze concrete was the sort of concrete that would last in a fire better than any other. Some people said there were two sorts of coke breeze concrete—one was called pan breeze, and the other was called ordinary coke breeze. If anybody could give him any information as to the values of these two different sorts of coke breeze he would be obliged. In some cases sawdust was used to cover a concrete floor, and, of course, it was much cheaper to use sawdust than sand. In conclusion, Mr. Max Clarke said he felt sure they would heartily support the vote of thanks he had the pleasure of proposing.

Mr. George Smith, in seconding the vote of thanks, said that before one got up to discuss the paper one wanted some time to study it quietly, but there were one or two points which struck him on which he would rather like some information. One was the point raised by Mr. Max Clark about coke breeze. He knew himself from experience that there were two kinds of coke breeze—or rather coke breeze and clinker breeze, which was usually passed off as equal to coke breeze. However, one was worth 1s. a load compared with coke breeze at 4s. or 5s. He did not think from the fire-prevention point of view clinker breeze was a safe material to use. He would like to hear from Mr. Spencer or Mr. Butler some idea of what would be a good proportion of cement and coke breeze for a floor. As regarded the question of steel joists rusting, to which Mr. Max Clarke had referred, he should say that if they adopted the usual limit of encasing their steel joists with 2 in. of concrete all round there would not be much danger of rusting. He recollected about some ten years ago a friend of his constructed a very large paper mill, in which a large quantity of iron joists and concrete were used, and almost as soon as it was finished there was a large crack right down the building, which they discovered was due to expansion of the concrete, and about that time he saw it stated in one of the professional journals that the rate of expansion was something like $\frac{1}{8}$ in. in 96 in., or something like that. He would like to know whether there was any reliable amount of expansion to be allowed for. Of course, in the floor to which he had referred, the usual deal fillets had not been provided — it was rather before they were thought of. With regard to the question of testing cement, he thought that to a very great extent for ordinary buildings they did not require cement to undergo such a severe test as was generally specified. Certainly if they specified for tests at all he thought they ought to make certain that the tests were carried out. The usual practice seemed to be to adopt a test and then not to carry it out. That, he did not think, was fair play to either the builder or the employer. What he would like to have some information about was as to what was a fair test for ordinary building cement as distinct from engineering cement. Of course he quite recognised that for engineering they wanted the very best cement, but for building purposes he did not see that they needed such a very strong cement. He remembered that some years ago he had to test samples from each eight tons which were delivered. It was regularly passed, but one lot was condemned, and of course the manufacturer was very much upset about it. He came down and put some of the cement in a mould and the cement stood the test, but the amount of pressure which he put into his pat was very different to that which was applied in the others. After that it was discovered that the machine used had been out of gear for some time, and consequently the whole thing was an absolute failure. They wanted to make sure that if a cement was going to be tested, it was tested by a standard measure. There were so many machines about that he thought the tests ought to specify the machines to be used for them. He would say in conclusion that in his opinion the specific gravity test was the best they could possibly have, provided they had the requisite equality of time between the different samples.

Mr. H. Claxton at this point explained a number of photographs bearing on matters put forward by Mr. Humphreys.

Mr. H. Cartwright Reid said that cement of course was one of the most interesting subjects to an engineer, and he had listened to the paper that night with a good deal of pleasure. It did them all good to go back over what might be somewhat familiar ground, and it did them good to hear the latest on any subject, and they had had both that evening. There were, however, so many points in the paper he would like to say a word about that he hardly knew where to begin. He was one of the engineers of the Admiralty and they were continually day by day dealing with cement. They tested every load of cement they used, and it frequently happened that their rejections were by no means small, and it often happened that they were told when a rejection took place that if they had only known it was an Admiralty specification the cement would have come all right. That contained a moral, viz., that if they did not test they did not get what they specified. One of the speakers said he did not quite see that architects required a very high quality of cement, and he supposed that with the ordinary mortars for sticking bricks together there was no point in having such very good cement. Lime mortars had answered the purpose, and they saw that in many of their most prominent buildings lime mortars had answered all the purposes of the architect. He did not know whether it was the practice in London amongst contractors to specify cement mortars, and to what extent; but for ordinary mortar it did not appear to him that architects gained very much by the use of cement. But in concrete, of course, they must use good quality cement, and when they were cutting floors down to the smallest dimensions so as to reduce the thickness, they must have the best quality cement. They had heard a good deal of very interesting matter as to the way tests might be manipulated, and he had had a good deal of experience, and had tested for thousands of tons of cement, or supervised such tests. He had often had the manufacturers' representatives, who had told them all sorts of things they wished done in order to bring about a proper result. One gentleman, from a large firm in the Medway, said he always liked to test his cement by the German method, and wished to have it encased in a glass case and at a uniform temperature, with so much moisture, and put on blotting paper. Well, as the cement which they were going to use was not to be put on blotting paper it did not appear to them that the test was going to be of very much good. One point not alluded to in the paper was that they ought always to have an average of samples. That was done by the Admiralty, and they found they never had two alike, but the average gave them an idea. To take one particular sample and test it was not very satisfactory. Then they had heard a good deal about the expansion of concrete and the expansion of cement. He had an example of that which rather took him back on one occasion. They were building the wall of a reservoir at Chatham 250 ft. long, about 16 ft. high, and 7 ft. thick at the bottom. It was built in the very hot summer about three years ago, when they had a sudden change from hot to cold weather, and the wall broke into segments at points about 30 ft. apart. They were very much perturbed and wondered if the foundations had given way, but it was noticed that on a very cold morning the cracks were a measurable quantity, and when the sun came out in the heat of the day they practically disappeared. They did not meet much guidance there to suggest a remedy, and when the temperature was low they filled the cracks in. They had also heard that night of the evils of the mortar-mill, and there was no doubt that a mortar-mill was not an unmixed blessing, and an example of that came to his knowledge which was of rather an amusing nature, in connexion with one of the Admiralty stations a good many miles from London. When they took a lease from the Chinese Government of Wei-hai-Wei there was a pier which had been built by some railway contractors some years before, and it was a pier of concrete piles surrounded by a wall, and on the top was a concrete floor which had been a good deal damaged during the Chinese and Japanese war. The Admiralty had the pleasure of putting the pier right, but in the interval between the war, the Chinese, being short of cement, took up the floor and ground it up to make fresh cement, as they could not get any other.

Mr. H. H. Statham said there were one or two points he would like elucidated. The writer of the paper had said there were three methods of manufacturing cement, and then he proceeded to mention four. He would like to know whether the rotary method was combined with one of the others. Another point sent a shudder through him. They had been told by every writer on cement that there was nothing like fine grinding, and that the more it was ground the more powerful it was. In the paper, however, they heard that finely-ground under certain circumstances was less effective than the coarse ground. He had been looking at the specimens, and one was marked "Cement of bad colour." He had looked at it with great interest, but in the first place he could not see any difference in colour between that and another one not condemned with that phrase. He did not think the difference was very marked. They would like to know what was the meaning of cement with "bad colour"—what bad quality it implied, and how they were to distinguish between cement of good colour and bad colour. There was a much larger point which had often exercised his mind, and that was as to the combination of iron with concrete. How far really did the iron and concrete act together? It seemed to him a very doubtful thing. When they put an iron joist into concrete, did they really act together in resisting forces?

A Member remarked that one thing occurred to him, which was the importance of seeing that the cement was not used hot and had been aërated. The manufacturers made it, and, of course, were anxious to get rid of it, and it went to the builders and merchants. They did not want to store it, for, of course, it meant money to them, and as soon as they had made it they wanted to get rid of it. That was an important thing for them to watch, and it was more important, perhaps, than the actual tensile strength. Some years ago Mr. Earl read a paper there on the manufacture of Portland cement, and it was mentioned then about not using cement when it was hot, and it impressed him very much, and it came in very useful to him because at that time he had to re-stucco a church, and it was most important that the cement work should not come cracking off very soon afterwards. Fortunately, he came to the discussion there and got the information from Mr. Faija and sent samples to him for testing, with the result that it was all right. He mentioned that because he felt that the use of fresh cement was the greatest danger they were likely to run into. He had listened with great interest to the paper, and was sorry Mr. Humphreys was not there himself, and he supported very heartily the vote of thanks.

Mr. L. Jacobs observed that Leighton Buzzard sand had been mentioned. He would like to know if anything had been ascertained about that, as a builder had told him there was a great deal of iron in Leighton Buzzard sand. Would that have any detrimental effect on Portland cement?

Mr. Arthur Harston said that he was glad to hear Mr. Humphrey advocated the necessity of different finenesses of sand. They wanted variations in the grains which cement would fill up. He quite agreed that from the architect's point of view, strength was no

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necessarily the most important factor in cement. The absence of expansion and contraction seemed to him from their point of view much more important. He did not mean to say strength was unimportant, but he did not think it was desirable to have an exceedingly strong cement if it would conduce to a greater liability of expansion and contraction, and that is why he agreed with previous speakers that strength was not only the only thing to be considered by architects in judging their cement. He, like Mr. Statham, was somewhat surprised to hear the lecturer say that fineness reduced the tensile strength. He was in hopes that the new process which was to winnow the cement so as to give them all flour and no residue, was to give them a better cement, and that a cement free of residue would be less liable to expansion. He was in hopes that they would have got rid of the residue altogether, but now his hopes were somewhat shattered. Of course, an architect dealt with cement as only one of the many materials he used, and he could not test everything. Cement came in in cartloads, and one would be all right and the next all wrong. They would not specify it to be ground extra fine in the way that people whose living depended upon it would specify. He was told that paviors always paid extra price for it and they had it stored and seasoned in the cement works, and that this special cement when it was sent out had a little blue ribbon tied round the mouth of the bags. They had got into the habit of calling it the blue ribbon cement. Referring to an article in the *Builder* of October 15, he would like to know whether there was any information whether gypsum was being used more largely. He believed it had been said that the addition of gypsum was a comparatively recent innovation in the manufacture of cement—at all events within the last few years. There were alterations also taking place, one saw from the *Builder*, in the manufacture of gas, and he would like to know whether the altered gas process increased the sulphur in the residual coke, and whether it altered the coke so as to affect a coke-breeze when used in the aggregate—whether more or less sulphur was in the coke, and if so, whether it had a prejudicial effect when used as an aggregate. With regard to expansion he might say that when care was taken in the aëration of the cement they had had no serious difficulties, but he had heard lately of several cases of expansion. The splits, as far as he came across them, were not very serious, but still if a building split into various sections, no matter how small, it was not a nice thing, and it was very peculiar that those fractures had occurred in buildings in which coke breeze floors had been laid. Certainly they were rather long floors—120 ft. long—and they had been laid in all seasons and in all normal temperatures. The expansions, however, took place from six to eighteen months afterwards. It might have been considered that the expansion really took place earlier, but in this case it was not so, because the inside cement was put on a considerable time afterwards, and the inside cement had been painted and varnished and no cracks were observable until some time after that. So that it was evident, as far as his experience was concerned, it was some new kind of expansion he had not met with before. In a conversation with Mr. Spencer that evening and also from the remarks of several of the gentlemen who had joined in the discussion, he found that his experience was not unique. But in these cases, he should imagine, the cement was either unusually defective or had not been properly aërated. He would like to know whether the concrete expansion depended at all on the aggregates. For instance, would ballast concrete or coke breeze concrete be more liable to expansion? He himself thought that coke breeze concrete was not so liable to expansion, or that if it did it might expand in the vertical position, whereas ballast concrete would go the other way—that is, expand in the direction of length and not of thickness. He did not know how far that affected the question of breeze always containing sulphur. He had a case in which a hot-water pipe was laid in a pipe filled with coke breeze, and it rotted away in a very short time, and the explanation given was that there was sulphur in the coke breeze. Whether that caused the expansion in that particular case he did not know, but there was always sulphur in the breeze, and it appeared to him if sulphur lime compounds affected the cement to any great degree, then the sulphur in the breeze and the lime in the cement might be reasonably suspected of interacting on each other. In a publication which had been before them some time it was stated that pan breeze should be strictly prohibited, but an eminent architect who had had the conduct of many large buildings specified pan breeze and a certain amount of coke breeze. Ordinary breeze was that which fell through in the gas companies' works. But pan breeze was that coke which they used over again as fuel under their retorts, so that it got burnt again. Whether that affected it he really did not know, but the two authorities he had referred to quite differed as to which was the best. He was told on inquiry of a gas engineer that pan breeze was much cheaper, and that was why builders preferred to use it, he supposed. It contained little particles of iron from the furnace bars, and he should imagine it contained a good deal of ash. Then again, the stuff which was called clinker breeze was got from furnaces. He thought that was the worst of the three, as it contained a good deal of impurities—iron and so on. With regard to aëration, a builder told him some time ago that a builder would be a fool who did not aërate cement, because if they took the hot cement and aërated it they could make much more of it; but when the builder came to do the work, he (the speaker) found that he had considerable objection to aërating it. The question had been raised about the use of the mortar mill. As to iron joists rusting, it was quite a new experience to him. He had seen iron joists taken out all right, but personally he did not like them painted. With regard to that point sometimes pins were put in to give a hold and sometimes square rods were used and twisted—in fact anything to prevent the iron from slipping. It was a curious thing with regard to the addition of gypsum to cement that it delayed the setting of the cement, and that was a thing he did not know before the paper was written. If the cement was going to be good, he did not know what good was done by delaying the setting, and if it was going to set in five minutes they should not use it at all, and he did not think the addition of gypsum was any good in that case. There was one question he would like to ask. They had heard of the slaking of lime as it was done by the Romans. They used to put it in a pit for three years, and he would like to know what kind of lime that was. If they in England nowadays were to slake lime for three years in a pit, and it happened to be only a very slightly hydraulic lime—the stone lime used in London—what little hydraulic properties it had would go.

Mr. J. G. Walker remarked that it had been said that Portland cement should not be used hot, and should be turned over four times; but it had not been said what intervals should elapse before each turn-over. He might say that in drawing up a specification the other day they were not allowed to use Leighton Buzzard sand in the concrete, and a builder who came in said he knew from experience that Leighton Buzzard sand would not set under water. He said it was all right where the air had a certain amount of effect upon it, but it would not set under water.

Mr. D. Butler Butler (Special Visitor) said that there were so many points in the paper that he would hardly have time to deal with them all. One speaker had referred to four processes of cement manufacture, but he, Mr. Humphreys, was wrong in tabulating the rotary process as a fourth process. The rotary process simply referred to the calcining of the cement and nothing else. There was the amalgamation of the raw material, the chemical combination of the raw material into certain chemical constituents by heat, and the grinding of the clinker after it had been burned to a powder. So, really, the rotary process was hardly a process at all, and was only a third of the process. Then Mr. Humphreys made the statement "When the kiln charge has been burnt through it is drawn, and in the better class of works the unburnt portions of the slip are picked out by hand for recalcination." It was rather unfair to refer to that "better class of works," because from his experience he knew that nine-tenths of the works had a boy specially told off to pick out the unburnt portions. With regard to the point raised by a speaker as to the effect of the fine grinding of cement, he thought the speaker scarcely understood Mr. Humphreys' point when he said that fine grinding deteriorated the value of cement, because it was the reverse. Fine grinding might perhaps make a cement give a lower tensile strength when gauged neat, but when it was used with sand the fine grinding gave a much greater covering power, and therefore greatly increased its value. There was another point mentioned by Mr. Humphreys, viz., that in finely grinding the cement they also obviated the blowing or expansion, because the blowing or expansion was generally due to particles of free or uncombined lime contained within the unground particles of clinker, which was subsequently affected by water in the concrete. It had been proved by experience that if fine ground the tendency to blow was largely obviated. With regard to the specification on the tests Mr. Humphreys advocated, he divided them into three. These were all very well, but he did not think they were of any value unless they also had some idea of the strength of the cement. He was at issue with Mr. Humphreys as to the cooling of cement. He says, "A sample of cement shall be made into a paste, and if the rise in temperature be more than 6 deg. Fahr. during an hour after mixing, the cement shall not be considered ready for use nor for testing." He submitted that the evolution of heat during setting was entirely due to chemical action, and did not depend on the lime. The heat depended on the setting qualities of the cement, and nothing else, and, therefore, he did not understand the reference to 6 deg. Mr. Humphreys headed his specification for "important works," and he took it that the specification was a good deal too laboured for the ordinary small building work. It would cost too much, and it would be scarcely worth carrying out for small work, but for an important engineering work it was, of course, necessary. Mr. Humphreys spoke very highly of Johnson's cement. He knew that firm produced very good cement, but it was rather a peculiar thing that in the specification he alluded to 1 per cent. of insoluble residue, while in the analysis he gave to Messrs. Johnson there was 2·4 per cent. He did not attach any importance to that. Insoluble residue was supposed to indicate the amount of burning to which that cement had been subjected, but after all it was negligeable. With regard to tensile tests, Mr. Humphreys said in the specification that test blocks of not less than 1 sq. in. cross section shall be made with 20 per cent. of water, but he could not agree with any hard-and-fast line being laid down as to the amount of water to be used in gauging cements. Some required 24 or 25, and some 18 per cent. It was purely a matter of the requirements of the particular cement under examination. Then Mr. Humphreys said a pat made with 20 per cent. of water shall not take less than three hours to harden, and not more than seven hours. Did that mean three hours before the final setting? He supposed Mr. Humphreys took the final setting. Then they came to the heating business again, and as he said before, that entirely depended on the setting properties of the cement. Coming to tests, and as to the best tests of architects' general work, he would like to refer to his late chief, Mr. Faija. One of his dicta was that for ordinary work if the cement was sound—that was to say, had shown no expansion or contraction—and well ground, in nine cases out of ten it was good enough for all constructive purposes. That was a broad specification, but he gave it as enough for most cases of architectural work. Of course, in addition to that, they might have the ordinary tensile strength test, but the soundness was the chief thing. It stood to reason that if the cement was unsound, it was no good showing strength, and that was a point he always tried to impress. Here, again, he disagreed with Mr. Humphreys, for he thought his test of soundness was too severe. For ordinary purposes he thought the Faija test quite good enough, which was a pat allowed to set in a moist atmosphere for seven hours and then plunged in boiling water and remain for fourteen hours. He had always found that reliable, both from a manufacturer's and user's point of view. He had had a good many years' experience as a maker of cement, and knew something about it. He thought that Mr. Humphrey's test should be used in a negative sense only. He meant that if the cement stood the boiling they could be quite sure they were safe; but not to say because it would not stand the boiling it was not safe. The point had been raised of the iron and concrete, and he understood that the cohesion of cement concrete to iron was equal to 550 lbs. per square inch. He could not say that he agreed with painting

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the joists, for it seemed to him that would destroy the cohesion. The reference to hot cements was somewhat of a misnomer. They could not call it hot, but he could describe it as a cement not fit to use. As to special storing and grinding for paving purposes, of course, if those who made a speciality of paving liked to pay the manufacturers a special price for fine grinding and special storing they might do so, but they could hardly expect the manufacturer in the ordinary way to grind cement extraordinarily fine and store it for nothing. The finer it was ground the more it cost.

Mr. Harston said his point was that the men brought the cement tied with blue ribbon and it was considered that was special for paving.

Mr. Max Clarke said in the previous specification it was left very vague.

Mr. Butler said a good deal of controversy had raged round the use of gypsum making cement slower setting. They all knew that gypsum had been accepted on the Continent for many years past within 2 per cent., but he was at one with Mr. Humphreys when he said he did not think the matter had been sufficiently threshed out yet to admit the use of gypsum without question. As to aeration increasing the bulk of cement, particulars were brought forward a few years ago at a meeting of the Institution of Civil Engineers that the effect of thoroughly aërating cement increased the bulk by 6 per cent. and it was also stated that the added bulk thus obtained paid for the cost of turning. As to Mr. Max Clarke's criticism of the experts, he thought he was very hard upon them. He knew it took experience to be able to test cement, and he had had twenty years of it himself, and it was only to be expected that a man who was always at it, as his assistants were, were able to do it better than those who did it once in a month. It was merely a question of manipulating the tools properly. The object of testing cement was, he took it, to know what it would do under the best conditions, for by taking the best conditions they got a criterion, and on the works they could not expect to approach these conditions.

Mr. Spencer, in acknowledging the vote of thanks, said that with regard to Mr. Butler's criticism he had seen his statement as to the cooling before, and had never quite understood it. Did Mr. Butler mean that aëration lessened the quick-setting properties.

Mr. Butler: Certainly.

Mr. Spencer said Mr. Butler admitted apparently that there was lime in the cement in a state of activity with regard to water, and it was known that water-slaked lime would cause a rise in temperature.

Mr. Butler said it might be in a slight degree due to the free lime, but it was so slight as to be negligible.

Mr. Spencer said that Mr. Humphreys' point was that, whether due to quick setting or lime, the cement should be properly aerated if it did not rise 6 deg. when treated with water.

Mr. Butler: Then I say that if it only showed 2 deg. it might be thoroughly unsound.

Mr. Spencer said Mr. Humphreys did not say that, he merely showed that they should not treat it as unsound because it was fresh from the mill. If they found it unsound before cooling it to that extent, they would be sure they would not improve it by aerating.

Mr. Butler: The chances are that by aërating it you would make it sound.

Mr. Spencer said that was so, and Mr. Humphreys wished to give it every chance. He would not consider the cement fit to put in the work before aëration. Several members asked a question as to what Mr. Humphreys thought the best aggregate for floors, and he believed he advocated furnace clinker. He did not know the proportion.

Mr. Claxton answered a question as to furnace clinker, and said the clinker they used was refuse-destructor clinker.

Mr. Spencer added that Mr. Humphreys did not wish to put forward Messrs. Johnson's cement any more than any other.

The meeting then terminated.

UNITARIAN CHURCH, BIRKENHEAD.—The old Unitarian Church at Charing-cross, Birkenhead, having been pulled down, it became necessary to find a new building. This is now being built in Bessborough-road, Oxton, where a school building has already been erected. The church is from the plans of Mr. J. J. Talbot, Liverpool, and will consist of nave, transepts, and chancel, with a gallery over a large waiting hall at the entrance end of the building.

Illustrations.

STUDIES FOR A MADONNA AND CHILD.

THESE illustrations are reproduced from two studies made by Mr. Westlake for a life-size painting of the Madonna executed as a commission from the Marquis of Bute, for the church at Old Cannock built for him from Burges's designs.

The Madonna is represented in this case as the "Mater humillima," and the representation is purposely carried out in the style of a good many ancient paintings of the same class. The colours are limited to brown and blue, the lights being assisted by gold hatching. In the study, as well as in the finished painting, the ground is gold, but it was impossible to represent this in lithograph, unless by a strong yellow, which has not a satisfactory effect; and the ground has therefore been kept dark, as the best means of making the figure stand out from it in somewhat the same decisive manner in which it would stand out from gold.

Mr. Westlake thought it would be of interest to place the study from life, specially made for the picture, alongside of the finished study. The process of translating, as it were, an Italian woman and child into a Madonna, is exactly that which we come across in comparing Raphael's figure studies with his Madonnas, except that in his more naturalistic school the difference between the original model and the picture is much less than in this case, where the finished study is purposely treated in a conventional and ecclesiastical manner.

The young Italian woman (now dead) who furnished the model was well known to various London artists under the name of Maddalena Fionda; she came from Picinisco near Monte Cassino, a neighbourhood noted for the pure Italian type of beauty among its inhabitants, who are called "Greeks" by the other Italians.

Both studies have been exhibited at the Royal Academy.

THE PALACE OF CHARLES V. AT GRANADA.

LA GIRALDA AT SEVILLE.

"SYMBOL of himself and Spain, great in conception and impotent in conclusion," is Ford's characteristic description of the Palace of Charles V. at Granada. The apparent completeness of the elevation, elaborately worked even to its sculptured details, hardly prepares the visitor for the mere abandoned shell that a closer inspection of the structure reveals. Devoid of either floors or roof, the massive masonry walls remain standing after nearly 400 years in an astonishing state of preservation, and little imagination is required to reconstitute the original design.

To assert that this building has suffered unjustly from proximity to the Alhambra is to record a simple fact, for it is even amusing to observe how visitors, intent on the novelties of Moorish art, have no eyes for a palace design which would be their centre of attraction in any other city in Spain.

Of the middle period of the Renaissance, this Palace is on the whole the finest specimen of the style in Spain, for though the early period of fresh and fanciful design had passed, the grandiose but dull formalism of Herrera and his followers had hardly begun to sterilise the Renaissance art of Spain. We are, in fact, in the presence of the work of an immediate follower of Bramante and Raphael.

The Palace was begun by Charles V. in 1526 as a Royal residence, in the lately conquered Moorish kingdom, and within the fortified hill of the Alhambra, immediately adjacent to the Moorish Court.

The architect was Pedro Machuca, who had studied in Italy among the band of brilliant pupils who gathered round and associated with Raphael. In the fashion of the day Machuca appears to have been a painter as well as an architect, and on coming to Granada in 1524 is said to have worked on Retablos for churches. He directed the Palace works for twenty-four years, dying in 1550. His son, then twenty-five years old, carried it on up to 1568, when the rebellion of the oppressed Moors caused the abandonment of the undertaking. This son died in 1572, and the expulsion of the Moors in 1610 caused the final ruin of the province.

The great masonry walls are well executed in a fine golden coloured stone, described by Ford as a "creamy pudding stone called Almendrado, from the quarries of El Turro." The centres of the two façades are of coloured marbles, white, green, black, and red. This colouring is managed with great skill, and without the dissonance of effect that the mingling of sandstone and marble might suggest.

The sculpture by Berrugete is very cleverly and finely executed. It is anatomical in character, after the influence of Michael Angelo's work. The bas-reliefs have figures, three-quarter turned to the spectator, exhibiting the play of muscles involved in such intricate positions. Some of the work is in much lower relief, as in the dies of the pedestals of the order. Some groups of boys riding on dolphins are put in with considerable effect of life and motion, but the more elaborate spandril figures are somewhat tame and stiff.

The circular court inside promised to be a fine feature, with its free standing columns and grand unbroken sweep of entablature, but only the lower order is properly completed; the upper, very low in relative proportion, is perhaps not according to the original intention.

There is a key plan of the palace in Ferguson (vol. iii.), and a somewhat more sympathetic criticism of the design than is usual with him, when dealing with Renaissance work.

The Giralda at Seville, so called from the vane which turns ("gira"), is happily described by Ford in his well-known "Handbook to Spain," as "a rich filigree belfry, elegant and attractive beyond description." Here Renaissance work so follows on Moorish that the whole tower is commonly regarded by visitors as one design. A close inspection will show the student that more of the Moorish core still remains in the upper part than his first impression will anticipate. The designer has triumphed over the shackles of the older work, and so capped the tower as to appropriate the old as the base of the new.

It is difficult, however, to say much for the detail of the Renaissance stages. It is one of those rare instances where the proportion and outline of the whole command success, in spite of the most grotesque detail. The flowers and their pots are of bronze, and the inlay shown in the pilasters, &c., is of ordinary Spanish glazed tiles, apparently black, but changing to the deep blue of the sky, in the strong sunlight of the south. The brickwork is pale red, and the stone slightly yellow with the same blue inlay in parts. The colour combination would be an utter failure in every probability in any northern climate, just as it would be a great experiment to undertake to revise the detail of the tower without the loss of its exceptional grace of outline. The reproduction of the tower at the last Paris Exhibition, in the Spanish quarter, completely failed to give the effect of the original.

The Moorish shaft is given in Ferguson as 185 ft. high by 45 ft. square, and it is suggested that it was built to commemorate the victory of Alarcos gained by the Moorish King Yousouf in 1159. Ford, however, gives 1196 as the date. The Renaissance addition was made in 1568 by Ferdinando Ruiz.

It will be noticed that the tower has no steps up but a vaulted inclined way winding round an inner shaft. The hanging of the bells, as shown, is the characteristic Spanish method, its picturesque effect is helped by the piled up headstock, required to counterbalance the bell which is pulled down by a short cord until it keeps turning round and round head over heels. The ringers pass round behind the bells by the passage between the outer and inner walls. For the largest bells the clapper is thrown by a cord against the side of the bell without the bell being swung.

The complete inscription is "Nomen Dei Fortissima Turris—Proverbs xviii. 10"—one word on each face. The upper stages of the tower as drawn were carefully measured up to the bronze turning figure on top, which is about 14 ft. high and is said to weigh 2,800 lbs. This was quite inaccessible, as there was no scaffolding available. The figure is of Faith carrying the labarum or standard of Constantine. It was cast by Bartolomé Morel in 1568.

All necessary permission and free access to the tower were granted with much courtesy by the Spanish clergy.

These drawings were made by the author during his Soane Medallion Tour in 1893.

A. T. BOLTON.

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REREDOS, ST. KATHARINE'S CHAPEL, QUEEN-SQUARE.

WE have not received any information from the architect, Mr. John Medland, in regard to this design for a reredos. From the treatment of the drawing, it is apparently a work in carved wood, and is richly decorated with canopy work and figure subjects.

ST. LUKE'S CHURCH, MAIDSTONE.

THIS design was submitted to the promoters in conformation with instructions to provide a church in which all present at a service could see the preacher, and in which the choir were to occupy an inconspicuous position in one of the transepts. It was abandoned in favour of the usual three-aisled church, in deference to the views of the late Archbishop of Canterbury. W. H. SETH-SMITH.

"GILLINGROVE," KENDAL; AND CURATE'S RESIDENCE, STANMORE.

THE first-named house of these two is situated at the top of some high land overlooking the grey old town of Kendal and at the head of the Gilling grove, which, during flood time, pours a torrent of broken water down the steep, declivity to the River Kent.

At the time it was built it formed the first attempt to introduce into the sombre town a little bit of colour and irregular skyline, and so far has this succeeded that visitors to the district find in it a pleasing relief to the surrounding uniform and square-built limestone buildings.

Mr. John F. Curwen, the architect, designed it to have a lower story of dressed limestone, the upper portion to be covered with red hanging tiles, red Ruabon chimney-stacks, and the whole covered with a steep roof of brown tiles. It was entirely built by local builders at a cost of 2,005*l.* 14s. 6d.

The Curate's Residence at Stanmore, Harrow, was designed by the same architect at the same time, in red bricks and brown tiles, and carried out at the comparatively small cost of 1,590*l.*; Messrs. George Kirby & Sons being the contractors.

CAMBERWELL BATHS COMPETITION.

THIS competition, the drawings of which have been on view at the present baths, has attracted fifty-two competitors, and the general character is above the average and includes some very excellent work.

It is somewhat bewildering to examine individually such a collection, as the requirements and restrictions which the limited site affords do not give scope for much variation in general. Two great swimming baths had to be provided, 130 slippers, thirty-two douches, Turkish baths, a complete parochial wash-house, and the necessary administration, all of which had to be dovetailed into the site, which is situate in the Old Kent-road, the long side of the site being to Marlborough-road.

The planning of a great bathing establishment must necessarily be subjective to a full knowledge of the working and administration of the same. The great extent of these swimming baths and their non-use for bathing during the winter has brought in a new element in their utilisation for entertainments. In so doing they are brought within the province of the theatre regulations of the London County Council.

These two elements have, therefore, to be assimilated in the production of a successful plan in compliance with the letter of the law in the matter of egress and exit, and the many conflicting details which are inseparable from the bathing requirements.

It is, then, not to be wondered at that there is so much similarity in the plans. The assessor's task has therefore not been an easy one, and the only way to arrive at a just result is the course which no doubt has resulted in the selection of No. 18, Mr. E. Harding Payne, who receives the first premium, 150*l.*, for of all the designs this one seems to contain the greatest number of good points, without being what we should term the best all-round design; but in its selection we entirely concur. Some minor points of detail it may be desirable to improve without affecting the general principles, and a very excellent plan will result.

The two swimming baths are placed side by side the long way of the site, parted from Marlborough-road by a narrow corridor, the utility of which is not quite clear; the second-class bath would probably have to be closed while the other is in use for entertainments. Provision has been made for artistes' rooms, and separate access thereto. The slipper baths are placed partly upon the ground and upper floors; the lighting to the latter might be improved. The galleries seem rather narrow, 2 ft. for seat and passing being too small. The same applies to the gangways and staircases, which require extra width.

A very excellently arranged Turkish bath is provided in the basement, while the wash-houses are disposed at the rear of the site.

The elevations are inferior in quality to the plan; they are red brick with stone dressings. As we have before remarked, this design seems to embody most of the essential points necessary to such an institution.

The second premium is awarded to No. 7. Messrs. Russell & Mallows, who show an excellent all-round set with many good points. The first-class baths are on Marlborough-road, and a good and original idea is secured by utilising the second-class bath for a crush-room, supper-room, and cloakrooms. This consideration has, however, resulted in the second-class bath having been sunk to below the level of the sewer, so that it would have to be emptied by a centrifugal pump. This, no doubt, has been considered an obstacle, notwithstanding the fact that it could be emptied quicker than by running the water away. The elevations are strongly executed in Renaissance, a tower being a prominent feature, but the detail is rather overweighted for a building of this character, the lower part being out of scale with the upper. The plan, excellent thought it is, falls behind the selected design in good and necessary points.

The third premium is awarded to No. 32, Mr. H. Dighton Pearson. This plan is not unlike the first noticed; the access to the artistes' rooms is not fully considered, and though it is full of admirable working points, it lacks the compact qualities of the first premiated design. The latter is somewhat deficient in practical and technical information, while Mr. Pearson's sections show minute study of the requirements; the elevations are also more satisfactory than those placed first.

After inspecting the majority of the designs, a large number of which are evidently by architects who have had practical experience of the construction of public baths, a return to the selected design demonstrates that it is evident that its combination of good points has gained the award.

No 9 shows a capital set of drawings, but placing the men's slipper baths at the rear, partly over the public wash-house, is not the best arrangement. The elevations were among the best in the exhibition; the style is latter-day Renaissance, but the general character of the design is hardly expressive of baths.

No. 34 has, at first sight, rather a straggling look, the second-class bath being at the rear on a diagonal line, bisecting the site into first and second class. The vexatious gallery question is cleverly solved by omitting it over the dressing-boxes, which are kept distinct on the east side, the space under the galleries being utilised for cloakrooms and stores, thus improving the character of the entertainment hall.

The elevations are red brick and terra-cotta, and are of a suitable and interesting character. No. 27 is an interesting and characteristic design, beautifully drawn, the elevations being simple, elegant, and refined, and evidence more knowledge than is displayed in the plan. No. 20, on the other hand, is uninteresting and commonplace in regard to external adornment, but the plan shows much practical knowledge. The two great baths are placed *en échelon*, with good direct exits and supervision, one particular feature being the placing of the men's second-class slipper baths around the gallery of the second-class bath.

No. 48 is a strongly executed set, not without character in the elevations, which are loaded and heavy. No. 11 has a remarkable similarity to No. 34; in this design the dressing-box question is again tackled, the boxes being placed below the galleries in bays. The whole set had much good suggestion. No 4. has simple and dignified expression in the elevations. No. 6 is one of the few designs which attempt a definite idea, the second-class bath being placed upon Marlborough-road, and is made a crush-room to the entertainment hall or first-class bath. No. 37 arranges his swimming baths by placing them at right angles to one another; but the plan becomes involved. No. 40 has points not unlike No. 6; the slipper baths being placed to the front and back of the site is not the best arrangement for supervision.

INCRUSTATION ON ST. PAUL'S CATHEDRAL.

IN a recent "Note" in the *Builder* reference was made to the paper read by Mr. E. G. Clayton before the London Chemical Society on the subject of incrustations taken from the Portland stone balustrade round the base of the dome of St. Paul's Cathedral. Some further consideration of the subject may be of interest.

This balustrade is surmounted by a heavy coping stone of the same material; much of the surface is greatly "weathered," and is coated by a stratum of a grey or black substance which in some places (especially on the under side of the coping stone) attains a thickness of ¾ in. This material, which is brittle and detachable with a knife, has a very rough and irregular surface, is stalagmite in character, and though differing in colour, in other respects resembles very closely some boiler deposits, and is easily reduced to a fine grey powder.

Analysis of the Incrustation.

Water (lost at 100 deg. C.)	2·06
Water (lost at 150 deg. C)	22·48
Organic matter	1·10
Lime	26·44
Magnesia	·27
Ferrous oxide	1·31
Sulphuric acid (combined)	34·03
Phosphoric acid	1·02
Carbonic acid	none
Chlorine	trace
Silica, sand, &c. (including combined silicic acid, SiO_2, 2·33)	10·39
	100·00

From the above results the substance is evidently composed chiefly of hydrated sulphate of lime associated with some siliceous matter and minute particles of carbon in the form of soot. The solvent action exerted by rain charged with sulphurous and sulphuric acid derived from the gases and smoke of innumerable chimneys of the surrounding buildings, has after the lapse of two centuries transformed the original carbonate of lime of the Portland stone into sulphate of lime, which in a more or less soluble condition has been carried by water action and gradually deposited as calcareous tufa or stalagmite on the underside of the coping-stone.

The practical conclusion to be drawn from this research is very obvious, namely, that buildings in large cities, and especially in manufacturing towns, should not be constructed of limestone, which is readily decomposed by the acids existing in the smoke due to the use of coal largely impregnated with sulphur.

Granite and hard sandstone appear much better adapted for city buildings, but stone of a calcareous character was doubtless originally employed on account of its being more readily and therefore more economically worked into suitable shape by the stone cutter.

JOHN HUGHES.

COMPETITIONS.

HOSPITAL, BEXHILL.—In the competition for an isolation hospital, Bexhill, the design placed first was that sent in by Mr. Francis D. Smith, Parliament Mansions, Victoria-street, Westminster, and the second premiated design was by Mr. J. H. Cossar, Borrowash, Derby. The selected design was sent in by Mr. T. S. Inglis, Savernake-road, South Hampstead.

LAYING OUT GROUNDS AT BEXHILL.—In this competition the first premiated design was that sent in by Mr. J. W. Webb, of Bexhill, and the second was by Mr. J. Cheal & Sons, Crawley, Sussex.

COLEFORD SEWERAGE AND WATER SUPPLY.—The Coleford Urban District Council have adopted schemes of water supply and sewerage for that town prepared by Mr. Harry W. Taylor, of Newcastle-on-Tyne and Birmingham. The water will be obtained from a deep boring in the old red sandstone; the sewage will gravitate to the outfall and be disposed of bacterially. The estimated cost is 10,000*l.*

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ARCHÆOLOGICAL SOCIETIES.

SOCIETY OF ANTIQUARIES. — At the last meeting of this Society, Mr. W. Gowland read a paper on the recent work at Stonehenge. He said that he had had the honour of being chosen as the representative of the Society during the carrying out of the recent works at Stonehenge in raising the leaning stone to an upright position, and in examining the excavations made for this purpose. This work was effected by enclosing the stone in a cradle, and hoisting it up by winch power. When erect, the base was bedded in concrete, and the work, he believed, would be of lasting character. The various stages were illustrated by lantern-slides thrown on the screen. The excavations had been carefully mapped, and it would be possible to fix the locality where any of the objects were taken. The earth had been carefully sifted so that the tiniest fragment could not escape observation. Beneath the surface layer was rubble, overlying the chalk in which the stone was bedded. Mixed with the soil and rubble were lumps of sarsen, chips of diabase, hornstone representing the "bluestone" uprights, and flints rudely chipped or shaped into hammers, probably used in dressing the stones. The sarsen uprights and cross pieces showed signs of tooling, and a slab was exhibited side by side with a piece recently worked with one of the flint tools to show the tooling could be done with these implements. Large stone mauls were also found, probably employed for rough dressing the stones. A few bones and teeth of no interest were met with, and a pick made from a deer's antler. The only traces of metal were a copper-stained stone and a Roman coin. The stone tools and implements were of a rude type, quite different from what we usually associate with Neolithic times, but this might, perhaps, be accounted for by the somewhat rude purpose to which they were put. The transport and erection of the stones, Mr. Gowland said, offered no difficulties that might not have been overcome by the Neolithic men, and by means of lantern slides he showed how heavy stones were moved by man-power in Japan, and referred to Poynter's picture of the transport of a monolith in Ancient Egypt. He would fix the date of Stonehenge near the later part of the Neolithic period, and this would probably carry us back to 1800 or 2000 B.C. Its purpose was that of a sun-temple, and its analogue might be seen in an antique engraving exhibited on the wall. This he had brought from Japan. It represented the worship of the rising sun, a trilithon, an altar, and upright stones forming a line between that and the worshippers. These megalithic monuments were not copied by one people from another, but were the outcome of development on similar lines. Sir Norman Lockyer make some remarks on the astronomical view of the question, and the resemblance of the banks at Stonehenge to the stone avenue at Carnac, and the Sphinx avenues in the Egyptian temples. He thought it probable that Stonehenge might have served a religious purpose, but they should not unduly labour the point that such structures were connected with any kind of sun-worship, though the inner circle at Stonehenge resembled the Naos of the sun-temples. One of the chief necessities of early man was the measurement of time, and that these structures might be made to subserve. The astronomical results of the work done at Stonehenge in the determination of the temple axis gave a date of 1680 B.C., with a minus variation of about 200 years.

CRYSTAL PALACE ENGINEERING SCHOOL.—The "Wilson" premium for the best paper read before the Crystal Palace Engineering Society during the present session has been awarded by the Council to Mr. S. J. N. Carrington for his paper on "The Widening of the Brighton Line between Balham and Croydon." Other papers read during the term were "The Eastbourne Pier Improvement Works," by Mr. J. M. Attlee; "Trade Unionism," by Mr. F. H. H. Williamson; and "Modern Electricity," by Mr. E. A. A. Parsons. The premium was presented to Mr. Carrington by Colonel Raban, R.E., Director of Works to the Admiralty, on the occasion of the eighty-seventh distribution of certificates at the above school on December 20.

LIVERPOOL ARCHITECTURAL SOCIETY. — The second members' meeting of this Society was held on the 16th inst. in the Law Library, Castle-street. Mr. C. J. Andersson presided. Mr. C. Brien read a paper on "Wood Staining and Veneering," illustrated with specimens of woods and stains. Mr. James Cook afterwards exhibited a series of lantern slides of French cathedrals.

The Student's Column.

GAS AND GAS-FITTINGS.

26.—BRITISH LAWS AND REGULATIONS RELATING TO ACETYLENE AND CALCIUM CARBIDE—FIRE INSURANCE.

WHEN calcium carbide was first placed upon the markets as an article of commerce very little was known by the general public concerning its nature and properties, and a number of acetylene generators were constructed which were a source of danger to those to whom they were sold. Fatal accidents, moreover, occurred in America and on the Continent, owing to the attempt to use acetylene compressed and liquefied in metal cylinders under high pressures, and it was not until acetylene in this condition had been proved to be an extremely dangerous explosive that the use of compressed or liquefied acetylene was abandoned. The British Government speedily recognised the desirability of safeguarding the public by introducing reasonable regulations as to the conditions under which carbide and acetylene may be used, and public confidence in the new illuminant has been restored by the fact that, since these regulations have been enforced, acetylene has been extensively used in this country under a great variety of conditions with very few serious accidents.

Acetylene has now been used for a sufficiently long period, and in sufficiently large quantities, to prove that it may be safely used by the general public for all ordinary illuminating purposes, provided that the conditions under which it is used do not violate any of the legal enactments, of which brief digests are given in the present chapter, and that such reasonable precautions are taken as are set forth in the printed Regulations issued by the Public Control Department of the London County Council for use within the area under the jurisdiction of that Council.

The Storage and Transport of Carbide.

Calcium Carbide placed under the Petroleum Acts.—By an Order in Council, dated February 26, 1897, calcium carbide is brought under the Petroleum Acts, 1871 to 1881, with the deletion of certain clauses which relate only to petroleum and similar liquids, and with the following additions:—

The label on a vessel containing calcium carbide must bear in conspicuous characters the words:—

"Carbide of Calcium."

"Dangerous if not kept dry."

"The contents of this package are liable, if brought into contact with water, to give off a highly inflammable gas."

Also every package or vessel must bear upon it:—

(*a*) The name and address of the consignee or owner, if the package is to be kept.

(*b*) The name and address of the sender, if the vessel is to be sent or conveyed.

(*c*) The name and address of the vendor, if the vessel is to be sold or exposed for sale.

Licence Required.—Under the Petroleum Acts it becomes unlawful for any person to keep any quantity of calcium carbide, whether for sale or for use, without a licence from the Local Authority. By an Order in Council, dated July 7, 1897, a quantity of calcium carbide not exceeding 5 lbs. is permitted to be kept without a licence on any premises, provided that it is kept in "separate, substantial, hermetically closed metal vessels containing not more than 1 lb."

Where calcium carbide is to be stored in greater quantities than 5 lbs. in 1-lb. tins, a licence, granted for a sum not exceeding 5s. per annum, must be obtained from the Local Authority, and must be renewed every year. The conditions to be attached to such licence rest entirely with the Local Authority, and may vary in different districts, but usually only such reasonable conditions as are required to afford protection in the use and storage of the carbide are written upon the licence. In most districts the issue of carbide licences is made from the office of the surveyor to the Borough or District Council, but in the area controlled by the London County Council the licences are issued from the Public Control Department of the Council after inspection of the premises and of the vessels in which the carbide is to be stored, and the apparatus in which it is to be decomposed, by one of the Council's inspectors.

Acetylene.

Liquid or Compressed Acetylene Prohibited.—By an Order in Council, dated November 26, 1897, acetylene is declared to be an explosive when in a liquefied condition, or when subjected to a pressure exceeding 100 in. of water, and in such condition acetylene is "prohibited from being manufactured, imported, kept, conveyed, or sold."

Exception.—"If it be shown to the satisfaction of the Secretary of State that acetylene declared to be an explosive by this Order when in admixture with any substance, or in any form or condition, is not possessed of explosive properties, the Secretary of State may by an Order exempt such acetylene from being deemed to be an explosive within the said Act."

Compressed Mixtures of Acetylene and Oil-Gas.—By an order of the Secretary of State, dated March 28, 1898, it is ordered that a mixture of acetylene and oil-gas not containing more than 20 per cent. by volume of acetylene, and not subjected to a greater pressure than 150 lbs. to the sq. inch, shall not be deemed an explosive within the meaning of the Act, provided that the acetylene and oil-gas be mixed together before the gases are compressed.

Acetylene compressed into Porous Substances.—Certain substances have the property of absorbing a large proportion of acetylene when the gas is passed into them under pressure, and of evolving the acetylene in a continuous stream when the pressure is relieved or the temperature of the substance is raised. The substance containing this absorbed acetylene does not possess the explosive character of liquefied or highly-compressed acetylene. The liquid known as acetone is capable of absorbing 300 times its own volume of acetylene when the gas is passed into it under a pressure of 180 lbs. per square inch. An Order of the Secretary of State (No. 6), dated April 10, 1901, declares that acetylene, when compressed into porous substances, with or without acetone, shall not be deemed to be an explosive within the meaning of the Act, provided that the porous substances to be used shall be similar in every respect to samples deposited at the Home Office, that the pressure does not exceed 150 lbs. to the square inch, and that certain other conditions set forth in the Order are not violated.

Acetylene Mixed with Air Prohibited.—By an Order in Council, dated May 15, 1900, it is ordered that acetylene in admixture with air or oxygen shall be prohibited from being manufactured, imported, kept, or sold. Nothing in this order applies to mixtures produced by admitting air into the burner, or to air unavoidably admitted into the generator when recharging.

Conditions of Licence from Local Authority.

Local authorities may attach any conditions which they consider necessary to the carbide licences issued in the districts over which they have control, but the printed regulations issued by the London County Council may with advantage be used as a model by other local authorities, and the following extracts therefrom include all the essential conditions.

London County Council.—In addition to the regulations as to the labelling of vessels containing carbide to which reference has already been made, the London County Council grant licences within the County of London upon the following conditions:—

1. Application to the Council for a licence to keep carbide of calcium at any place in the County of London (except the City of London) must be made upon the form provided for the purpose, which can be obtained by application in writing, addressed to the Chief Officer, Public Control Department of the London County Council, 6, Waterloo-place, S.W.

2. Every application must be accompanied by a fee of 5s. in money, or, if sent through the post, by cheque or postal order for that amount payable to the order of the London County Council. The fee will be returned to the applicant if the licence be not granted.

3. Every application must state—

(*a*) The quantity of carbide which the applicant desires to keep;

(*b*) The proposed place and method of storage;

(*c*) If the carbide is only to be kept in closed vessels, or if it is to be used in the manufacture of acetylene gas.

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4. Carbide of calcium should be kept in strong metal vessels, and—

(*a*) Such vessels should be constructed and closed as to prevent the admission of water or atmospheric moisture.

(*b*) Such vessels should only be opened for the time necessary for the removal of any required quantity of carbide, or for the refilling of the vessels.

(*c*) No vessel should have a greater capacity than 3,696 cubic inches (equal to a cylindrical vessel 14 in. in diameter and 24 in. in depth).

(*d*) Every vessel of a greater capacity than 2 lb. should be provided with a lock or be placed in a locked receptacle, so as to prevent unauthorised persons gaining access to the contents.

(*e*) Copper should not be used in the construction of vessels for containing carbide.

5. Vessels containing carbide of calcium should not be kept inside dwelling-houses, but preferably in dry and well-ventilated outbuildings.

6. Small quantities of carbide for sale or immediate use will, however, be allowed in shops, dwellings, or workshops, upon licensed premises, if the arrangements are satisfactory.

7. The Council proposes only to grant licences to keep carbide of calcium which is pure (in a commercial sense), *i.e.*, which contains no impurities liable to generate phosphoretted or siliciuretted hydrogen so as to render the gas evolved liable to ignite spontaneously.

8. Where carbide of calcium is kept for the manufacture of acetylene gas, it is desirable that such of the following precautions for ensuring safety as are applicable to the circumstances, should be adopted :—

(*a*) Every apparatus for generating and storing acetylene gas should be placed in an outbuilding. (This does not apply to portable apparatus holding a charge of less than 2 lbs. of carbide.)

(*b*) Such building should be situated as far as may be practicable from inhabited buildings, and should be well ventilated.

(*c*) No fire or artificial light as would ignite inflammable gas should be taken into or near the building or place where a gasmaking apparatus is situate.

9. Every apparatus (including generator and gas holder) used for acetylene gas should as far as practicable be constructed and used so as to provide against the special risk, *i.e.* :—

(*a*) Copper should not be used in any part of the apparatus ;

(*b*) The various parts should be of adequate strength ;

(*c*) Escape of gas from the apparatus should be carefully guarded against ;

(*d*) Satisfactory provision should be made against dangerous development of heat ;

(*e*) Satisfactory provision should be made against undue pressure by the employment of an adequate safety valve connected with a pipe discharging into the open air, and a suitable pressure gauge should be attached to the apparatus ;

(*f*) Provision should be made for the residue of the carbide being mixed with at least ten times its bulk of water on being removed from the apparatus ;

(*g*) No person should have charge of an apparatus until he has been properly instructed in its management.

10. Licences are granted for keeping carbide of calcium for periods not exceeding one year, and prior to expiration application must be made for their renewal. Notice of the expiration, and a form of application for renewal, is sent to each licensee at the proper time.

With reference to the foregoing regulations it may be mentioned that under certain conditions, which seldom exist in practice, copper may be attacked by acetylene, and a highly explosive compound, known as copper acetylide, formed. Danger from overheating or excessive pressure only exists when generators of faulty design or construction are employed.

Danger of spontaneous ignition of the acetylene through the presence of impurities in the carbide does not exist at the present time, because the quantities of phosphuretted hydrogen and silicuretted hydrogen evolved from the carbide now manufactured are much below the danger limits.

The following is a copy of the "application form" for a carbide licence issued by the London County Council :—

LONDON COUNTY COUNCIL.

PUBLIC CONTROL DEPARTMENT.

PETROLEUM ACTS, 1871 TO 1881,
And Orders in Council dated February 26, 1897, and July 7, 1897.

.....Reg. No.

Application to the London County Council for a Licence to keep Carbide of Calcium.

This application should be fully filled up in accordance with the following instructions, and forwarded to the Chief Officer of the Public Control Department, London County Council, 6, Waterloo-place, S.W., with a P.O. or cheque for 5s., payable to order of the London County Council and crossed. This fee will be retained if the licence be granted, or returned to the applicant if the licence be refused.

State Christian name and Surname of the applicant.
If a firm, the names of each member in full. If a company, the name of the company and its secretary.

State situation of the premises for which the licence is required.

State quantity desired.
If the quantity is 10 cwt. or more, a plan must accompany this application, showing the proposed place and method of storage, and the buildings within 50 ft. of such place. The plan must be to the scale of ⅛ in. to 1 ft.

State if the carbide will be kept and sold unopened in the vessels in which it is received, and, if not, what will be done with it.

State in what vessels the carbide will be kept, capacity of vessels, how closed against moisture, and of what material constructed.

State (*a*) in what part of the premises the carbide is to be kept ; (*b*) the construction of the store ; (*c*) if the store is used for other purposes, and, if so, what.

State if the carbide is to be used for the manufacture of acetylene gas, and if so, state—
(*a*) The make and capacity of the generator.
(*b*) Particulars as to the building in which it will be placed, if detached from other buildings, and if used for other purposes.
(*c*) How you propose to dispose of the residue.
(*d*) If the machine will be in the sole charge of a person properly instructed in its management.

*Signature of Applicant*_____

*Trade or Profession*_____

*Postal Address*_____

*Date*_____ 190 .

Corporation of London.—The conditions upon which the Corporation of London grant licences for the storage of carbide are very similar to those of the London County Council. The carbide has to be kept in metal vessels approved by the City Surveyor, and the place of storage, which must not be an inhabited house, has also to be approved by the City Surveyor.

Fire Insurance.—Fire Insurance Companies do not, as a rule, charge any extra premium on buildings in which acetylene is used, provided that the generator is located outside the building ; but notice should be given to the Insurance Company when the installation is introduced, and the insurance policy should be endorsed by the company to the effect that the use of the apparatus for the generation and combustion of acetylene is permitted. Some companies issue a printed list of rules for buildings in which acetylene is generated or carbide is stored, and for buildings in which acetylene is consumed ; but these are usually merely repetitions of some of the London County Council licence regulations which have already been enumerated.

GENERAL BUILDING NEWS.

REOPENING OF HACCONBY CHURCH.—The Bishop of Lincoln reopened the Parish Church of Hacconby, South Lincolnshire, on the 14th inst. The Earl of Ancaster, who is lord of the manor, undertook certain sections of the work, including the restoration of the chancel and side chapel, the tower, and the provision of seats for the chancel. The other portions of the work have been effected by public subscription. The whole of the work has been carried out to designs by Mr. C. A Bassett-Smith, the architect, Messrs. Halliday, of Stamford, being the contractors.

HOLY TRINITY CHURCH PRINCE CONSORT-ROAD, S.W.—On December 12 the Dean of Westminster laid the corner-stone of this new church, upon a site in Prince Consort-road which has been acquired from the Commissioners for the Exhibition of 1851. Towards the total cost, exceeding 25,000*l*, are apportioned the proceeds of the sale of the site and materials of the church of Holy Trinity, Knightsbridge, erected in 1860-1, after the designs of R. Brandon and H. M. Eyton, and illustrated in the *Builder* of April 21, 1860. The church, designed by Mr. G. F. Bodley, A.R.A, will have a capacity for about 800 persons. The buildings comprise a morning chapel, vestries, a parish-room, and a vicar's house. The style, we learn, will be English Gothic, after the manner and character of a town church in the fourteenth century, with a wide nave and chancel aisles. A new parish of Holy Trinity will be constituted, the benefice of the present Holy Trinity church having been united with that of All Saints' church in Ennismore-gardens.

MONIKIE PARISH CHURCH, FORFAR.—Monikie Parish Church has just been reopened after being restored. The interior of the building has been practically reconstructed, the internal fittings, gallery, and woodwork entirely cleared out, and substantial wood flooring put in. In place of the gallery stretching round the east, north, and west sides of the structure, one main gallery has been erected at the west end of the church, while the pulpit has been removed from its original position adjoining the south wall to the east side. The old windows set in the north wall are converted into lancet windows, and the whole have been reglazed with lead light. Over the pulpit in the east gable a new three-light window has been formed. All the sittings have been renewed in pitch pine. The operations were conducted under the supervision of the architect, Mr. James H. Langlands, Dundee. The contractors were :—For mason work, Mr. Charles Dick, Monifieth ; joinery, Messrs. A. Bruce & Son, Dundee ; plaster work, Mr. John Doig, Forfar ; slater work, Mr. Alexander Hogg, Carnoustie ; heating and plumbing work, Messrs. A. L Peacock & Co., Dundee ; painter work, Messrs. P & A. Davie, Dundee.

WESLEYAN CHAPEL, MARLOW.—A new chapel was opened for the Wesleyan community at Marlow recently. The new chapel has been erected by Mr. Y. J. Lovell, builder, of Marlow, from designs prepared by Mr. R. Wellicome, architect, of Marlow. Externally, the edifice is constructed after the Renaissance style, and red bricks have been used with Bath stone dressings. The interior is approached by a semi-circular porch. The floor of the porch is paved with mosaic. On one side of the central gable a staircase has been erected, which leads to a gallery situated at the southern end of the building. Internally the chapel is 31 ft. 6 in. in width by 51 ft. in length, and accommodation has been provided for 300 persons.

COUNTY SCHOOL, MILFORD.—On the 4th inst. new County School buildings were opened at Milford. The schools, which have been erected at a cost exceeding 2,000*l*., consist of a stone building relieved by Bath stone. They will provide accommodation for 100 students, and there is an assembly hall, classrooms, kitchen for cookery classes, with the usual cloakrooms, &c. The floors are all wood block. Adjoining the buildings are two playgrounds, divided for boys and girls. The architects were Mr Walter J. Wood, of London, and Mr. J. B. Gaskell, of Milford Haven, and the contractors Messrs. George Cole & Sons, of Milford Haven.

NATIONAL SCHOOLS, STOCKPORT.—New National day and Sunday schools have been erected at Spring Gardens, Churchgate, Stockport. The site of the present schools and the buildings at Wellington-road South, directly opposite the Stockport Infirmary, have been acquired by the Corporation with a view to the erection of a town hall and

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municipal buildings. The new schools will cost about 8,000*l.* The buildings occupy an elevated site; there are separate departments for boys, girls, and infants, and an assembly-room, the accommodation being for 600 day scholars. Messrs. Stott & Sons, Manchester, are the architects, and Mr. Josiah Briggs, Stockport, builder.

POST OFFICE, SWANSEA.—The new Swansea Post Office has been erected on the site of the old Mackworth Hotel, in Wind-street, Swansea, and runs back to the Strand behind. The façade in Wind-street is stone, relieved by carvings and granite pillars. The parapet is surmounted by four stone figures, emblematic of the four countries of Great Britain, Wales and England being central and prominent. There is an ornamental tower above. There is to be a porch over the main entrance. The side elevation in Green Dragon-lane is built of bricks, and there is a separate entrance for the female staff and the public having business with the principals of the various departments. The rear of the building is faced with buff bricks and stone dressings. The entrance for the mailcarts and mail staffs is from the Strand. The mails will be driven in and unloaded under the shelter of a glass roof, on to a platform level with the sorting office. Entering the building from the main doorway, the public business room is on the right hand side of the vestibule, and is furnished with the customary clerks' counters and tables for the public. To the left of the vestibule are the respective private offices of the postmaster and chief clerk. The sorting-room is 132 ft. by 36 ft. On the first floor are rooms for the engineer, and a telephone-room. Opening out of the instrument-room are the superintendent's room, lavatories, &c. On the second floor there are the female clerks' retiring-room, lavatories, a dining-room for the benefit of the staff generally, and a kitchen. On the top floor are a gymnasium, a recreation or music-room, and a messengers' waiting-room. The contract for the erection of the new building was originally given to Messrs. David Jenkins & Co., but the work has been finished by the Government's clerk of works.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of Aberdeen Town Council report having sanctioned the following plans:—Additions in connexion with the Royal Lunatic Asylum, Berryden-road, per Mr. George Taylor, clerk of works; two dwelling-houses and shop on the west side of King-street at its junction with School-road, for Mr. John Adams, per Mr. William Ruxton, architect; alterations in connexion with premises on the west side of Commerce-street, for Messrs. Brown & Robb, per Messrs. Brown & Watt, architects; alterations in connexion with shop front at No. 83, Union-street, for Salmon & Gluckstein, Ltd.; alterations in connexion with shop front at No. 96, Union-street, for Miss Walker, Forsyth Hotel, per Messrs. Brown & Watt, architects; alterations and additions in connexion with bakery on south side of Queen-street, for Mr. Thomas Mitchell, baker, per Mr. R. G. Wilson, architect; fish-curing premises on the west side of North Esplanade, for the Scottish Co-operative Wholesale Society, Ltd., per Mr. James Davidson, architect, Glasgow. The Committee had also before them plans of two dwelling-houses on the east side of Sunnyside-road, for Mr. Charles Aden and Mr. William Petrie, per Mr. James Brown, builder; dwelling-house on the north side of Bedford-place, for Mr. Joseph Shirras, builder; two dwelling-houses on the west side of Forest-avenue, for Mrs. Lewis, per Mr. William Smith, architect; two dwelling-houses on the west side of Blenheim-place, for Mr. Alexander Robson, engineer, and Mr. George Robson, manager, Ceylon, per Mr. John Milne, architect. The Committee approved of these respective plans.

RESTORATION OF BRECHIN CATHEDRAL.—The restoration of Brechin Cathedral may now be regarded as an accomplished fact. The object of the recent scheme was, "while conserving what still exists of the ancient fabric, to bring back by a judicious restoration as much as possible of its pristine beauty." When the plaster ceiling was taken away it was found that the clearstory remained uninjured. Stone coffins were disclosed, and there were found the foundations of what had evidently formed a Norman building on the site of the present cathedral. The chancel had suffered least from the ruthless destruction of time and Vandal. It was a very beautiful and delicate piece of work of Early English pattern, and the fragment that remained has enabled the architects to continue the design through the restored part. The chancel is a thirteenth century one, coeval, of course, with the building of the cathedral. The composition of the windows is repeated; the roof is of oak, embellished with carvings; and the stone used is the same as that of the original construction. A porch dignifies the principal entrance on the north side. Doors for egress are provided, one from the new north aisle and one from the south transept, in addition to the great western door, which has been left intact. As there was little left to guide the architect in the restoration of the aisles, this involved a fresh design. The outside walls have been brought down to their proper height and roofed over, and the entire result brings into fine relief the famous round tower. Mr. Campbell contributed the expense of the organ case, made of Karri pine; a native of Brechin filled all the windows of the choir with stained glass, and in the chancel there are fourteen memorial windows. Other windows include one erected by public subscription to the memory of the late Rev. John A. Clark; another by the family of Shiress Will, of Ardovie. The Communion table, made of fine oak, with Gothic carving, was the gift of the Women's Guild of the congregation. So was the pulpit of oak, with cusps and canopied niches and figures. It stands at the south respond of the chancel. On the north respond is a large Corennie granite font, the gift of the Rev. William Duke, of St. Vigeans. The architects were Messrs. John Honeyman, R.S.A., and Keppie.—*Dundee Courier.*

WESLEYAN SUNDAY SCHOOLS, ILFORD.—The memorial stones were recently laid of the new Sunday school and church premises in course of erection at the rear of the Wesleyan Church, High-road, Ilford. The building, which is to cost about 3,000*l.*, will have accommodation for 550 adults, and will consist of a classroom, 50 ft. by 40 ft., and an infants' class room, 17 ft. by 20 ft. There will be a church parlour and other rooms on the first floor. The building is of bricks, with bath stone dressings, and will be about 30 ft. high. The interior will be lighted by gas, and heated with Grundy's patent hot air system. The architects are Messrs. Gordon & Gunton, and the builders Messrs. E. A. Roome & Co.

FACTORY, BRISTOL.—A new boot factory is being built to the order of Messrs. Parsons & Co., boot and shoe manufacturers, at Gerrish-avenue, a part of the Whitehall Estate, St. George. The new factory, when complete, will be 200 ft. by 120 ft., and the basement story will cover an area of 115 ft. by 60 ft. The premises, when complete, will be lighted with the electric light, and the heating of the factory will be by hot-water (low pressure) The flooring will be of granolithic, and the latest type of machinery will be erected in the new factory. The architect is Mr. John Mackay, of Kingswood, and the builder is Mr. Fred. Brown, of Easton.

COUNTY COUNCIL OFFICES, DUBLIN. — The building known for several years as the National Club in Rutland-square, having been acquired by the Dublin County Council, has been remodelled for the use of the County Council. The building has been remodelled by Messrs. J. & W. Good, builders, Dublin, according to plans prepared by Mr. W. Collon, C.E., County Surveyor. The painting has been done by Messrs. W. Martin, Son, & Co., and the panelling of the walls and the parquet flooring by Messrs. Goodall & Co., of Manchester. The Council chamber, committee-room, and secretary's office are furnished in Austrian oak.

GYMNASIUM AND INSTITUTE, CAMELON, STIRLING. —A new building for the Camelon Institute has been erected in Union-road. The accommodation comprises gymnasium, dressing-room, bathrooms, reading and committee rooms, recreation or billiard room, stores, caretaker's house, &c. The gymnasium is about 50 ft. long by 30 ft. wide, is lighted from the front by four windows, and also by four roof-lights. It may also be used as a concert hall when required, a temporary platform being fitted up at one end. The dressing-room opens off at the west end of the gymnasium, but has a separate entrance from the side street on the north. A set of lockers is arranged along one wall for the use of the members. At the south end are two bathrooms. The reading and committee rooms are on the north side of the gymnasium, and have communication with the gymnasium. The billiard-room on the first floor is suitable for two full-sized tables. The front to Union-road is built with Ballochmyle red stone and the other portions with red bricks, and the architects are Messrs. Robert Keith & Son, Dundee, and the contractors as follows:—Mr. R. Dalziel, mason; Messrs. Gilchrist & Packman, joiners; Mr. John Smith, plumber; Mr. James Millar, plasterer and slater—all of Falkirk; Messrs. G. H. Nicoll & Co., Dundee, heating engineers; and Messrs. Cousland & Mackay, Glasgow, ventilating engineers.

ORANGE HALL, BALLYMACARRET, BELFAST.—This building, which will be four stories in height, is nearing completion. On the ground floor there will be four shops—two on each side of the main entrance corridor. At the end of the corridor, stairs on both sides will rise to the landing place on the first floor, from which access will be had to two lodge-rooms (30 by 20 ft., and in case of necessity these two rooms can be thrown into one by the withdrawal of a folding door. It is estimated that this room will then give accommodation for meeting purposes to about 500 persons. The second floor will be similarly arranged, and on the third floor there will be several lodge-rooms, store-room, &c. The design, plans, and specifications were prepared by Mr. Cooper, architect (now of Dublin), and estimates for the erection of the building having been completed, the contract was secured by Mr. K. G. Walker at 3,300*l.* The work is now under the immediate superintendence of Mr. Henry Seaver, architect, Belfast.

NEW BUILDINGS IN ABERDEEN. — At a meeting of the Plans Committee of the Aberdeen Town Council on the 12th inst., fourteen sets of plans, including thirteen new dwelling-houses, were submitted. The only item of a public nature was a plan for additions to Rosemount Public School, comprising increased classroom accommodation, rooms for cookery, and manual instruction, &c, at a cost of 7,000*l.* The total amount involved in the plans submitted to the meeting was about 20,000*l.*

ST. ANDREW'S CHURCH IMPROVEMENTS, BRAEMAR.—In pursuance of the improvements going on in St. Andrew's Church, Braemar, the vestibule of the church has been laid in mosaic. In the centre of the floor is a full-length figure of St. Andrew, the patron saint of Scotland and of the church, with his distinctive cross, and holding in his hand the book of the gospels. The border of the design is made up of the thistle of Scotland and leaves. The original idea of the design was supplied by Canon Paul, the pastor of the church, and was wrought up by Messrs. Minton, Hollins, & Co., Stoke-upon-Trent, who executed the whole work. The work of laying the floor was entrusted to Messrs. Rodger & Baxter, of Aberdeen.—*Aberdeen Journal.*

SANITARY AND ENGINEERING NEWS.

DRAINAGE SCHEME FOR WALSALL.—On the 3rd inst., at Walsall Guildhall, Colonel W. R. Slacke held an inquiry on behalf of the Local Government Board into an application by the Town Council for sanction to a loan of 1,800*l.* for surface drainage works. The Town Clerk (Mr. J. R. Cooper) explained that it had been found that the sewers in the borough were not large enough to carry off the water which ran into them whenever there was a storm, and this had led to flooding in some of the lower parts of the town, which had occasioned great inconvenience. There were also difficulties in the way of dealing with it at the sewage farm. A scheme for laying a complete system of surface water throughout the borough had been prepared by the Borough Surveyor, the town being divided into fifteen districts. The estimated cost of the whole scheme was upwards of 23,000*l.*, but the Council decided to carry out the work in instalments.—The Borough Surveyor (Mr. R. H. Middleton) having given details of the work to be carried out, the inquiry terminated.

ABERDEEN HARBOUR WORKS.—A new entrance to the Upper Docks has been constructed at Aberdeen, and the old Regent Bridge, over the tidal harbour at the foot of Marischal-street, which, with the growth of trade and the development of the Upper Dock, not only had become unsuitable for shipping, but inadequate for the pedestrian and vehicular traffic, is being reconstructed. The new bridge will be built entirely of steel, and will be able to carry two locomotives, with trains, vehicles, and a crowd of people. The new passage which it spans will be 67 ft. wide, or 20 ft. wider than the passage opened for traffic on the 11th inst., which is only part of the new entrance; but the position has been shifted considerably south of the old passage in order to lead shipping more into the centre of the Upper Dock, and give protection to the vessels lying at the quays. The new bridge has abutments or piers of masonry founded on cylinders, on which it rests, and the south abutment is permanently completed and forms the south boundary of the new passage. The north abutment will be constructed within the cofferdam, which at present forms the north boundary of the new passage. As the Commissioners decided that the cross traffic should be carried on with the least possible interruption during the reconstruction, a temporary bridge had to be provided, and, seeing that the shipping traffic had to be transferred at a certain stage to the new entrance, it was necessary to provide an opening in the temporary bridge in line with the new entrance to let the shipping through. This has been accomplished by a bascule bridge, which is a light structure built entirely of steel. It has two leaves, which open in a vertical plane by revolving on axles or pivots carried in bearings on pilework. The width of the bridge is 14 ft. over all, made up of a carriageway 8 ft. wide and two pavements about 3 ft. wide. At the opening of the bascule bridge on the 11th inst., there were present Captain Crombie, harbour master; Mr. R. Gordon Nicol, C.E., harbour engineer; Mr. A. Simpson, assistant engineer, and others.

LONGTOWN WATER SUPPLY.—Having got the sanction of the Local Government Board to a scheme devised by Mr. John Little, of Carlisle, for the supply of the two parishes of Arthuret (including Longtown) and Kirkandrews-on-Esk, at an estimated cost of 17,000*l.*, the District Council have decided to enter into a contract with Messrs. Drummond & Sons, Dumfries, for the work to be carried out at a cost of 10,317*l.* 13s. 6d. There were sixteen tenders considered by the Council.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS.—Messrs Davis & Emanuel, architects, of 2, Finsbury-circus, have taken into partnership, as from the 1st January next, Mr. H. C. Smart, who has been in their office for fifteen years. The title of the firm will remain unaltered.——Mr. Charles E. Hawkins, who has served thirty-two years on the Government Geological Survey, has now retired, and intends to devote his whole time to private practice as a consulting geologist.

SPRAGUE'S POCKET DIARIES.—We have received from Messrs. Sprague & Co. their Pocket Diary and

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Architect's and Surveyor's Memorandum Book for 1902. On the usefulness of this small diary, and the tables of statistics bound with it, we have often spoken. They send us also a general pocket diary and memorandum book in another form the pocket-book forming a tolerably large leather purse or letter-case, with the diary inserted in one of the pockets.

SALE OF A LIBRARY.—Messrs. Sotheby, Wilkinson, & Hodge, held their last book sale of the season at their rooms in Wellington-street, Strand, on December 17, 18, and 19, when the catalogue included several hundred volumes from the library of the Royal Archæological Institute. The following were some of the prices realised:—"Monumental Effigies of Great Britain," by W. A. Stothard, 1817, 2*l.* 10*s.*; "The Principles of Gothic Ecclesiastical Architecture," by M. H. Bloxham, three volumes, 1882, 13*s.*; "Mediæval Military Architecture of England," by G. T. Clark, two volumes, 1884, 14*s.*; "Glossary of Terms used in Architecture," by J. H. Parker, 1850, 2*l.*; "On the Styles of Architecture in England from the Conquest to the Reformation," by T. Rickman, 1881, 1*l.* 13*s.*; "Some Account of Domestic Architecture in England," by T. H. Stone, 1851-3, 2*l.* 12*s.*; "Miscellaneous Tracts Relating to Antiquity," published by the Society of Antiquaries, 1770-1900, 16*l.*; "The Decorative Arts, Eccesiastical and Civil, of the Middle Ages," by H. Shaw, coloured plates and illustrations, 1851, 1*l.* 6*s.*; "Horæ Ferales, or Studies in the Archæology of the Northern Nations," by J. M. Kemble, edited by Latham and Franks, numerous plates, 1863, 1*l.* 16*s.*; "The Monumental Effigies, Ancient Stone and Leaden Coffins, Tiles, &c., in the Temple Church," two volumes, plates, 1843-5, 9*s.*; "Incised Markings on Stone, found in Northumberland, Argyleshire, and other places by the direction of the Duke of Northumberland," by Rev. J. C. Bruce, 1860, 1*l.* 9*s.*

THE INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday the 19th inst. at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Pockthorpe, Emmanuel, near Norwich, 70*l.*; St. Marylebone, St. Cyprian, Middlesex, 250*l.*; and Sandiway, St. John the Evangelist, near Northwich, Chester, 65*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Ashton, St. John the Evangelist, near Chudleigh, Devon, 25*l.*; Milford Haven, St. Catherine, Pembroke, 60*l.*; St. Columb Major, St. Columba, Cornwall, 35*l.*; Wembworthy, St. Michael, Devon, 15*l.*; and Radley, St. James, near, Abingdon, Berks, 30*l.*; in lieu of former grant of 20*l.* Grants were also made from the special Mission Buildings Fund to towards building Mission Churches at Preston, St. Matthias, near Brighton, 20*l.*; and West Bromwich, the Good Shepherd, Staffordshire, 25*l.* The following grants were also paid for works completed:—Forest Gate, St. Edmund, Essex, 150*l.* on account of a grant of 250*l*; Cardiff, St. Teilo, 300*l.*; Hoo, All Hallows, near Rochester, 10*l.*; Eastcombe Mission Church, near Stroud, Gloucester, 15*l.*; Churwell Mission Church, near Dewsbury, 25*l.*; Cowper Quay Mission Church, near Blyth, Northumberland, 20*l.*; and Steelworks Mission Church, near Ebbw Vale, Monmouth, 20*l.* In addition to this the sum of 257*l.* was paid towards the repairs of twelve churches from trust funds held by the society.

THE ELEVATIONS OF BUILDINGS AT BELFAST.—A deputation waited upon the Belfast County Council recently in order to state their objections to the clause making it compulsory that drawings showing the elevations of buildings overlooking any street in which it is proposed to erect or alter any building, as well as the height, character, and design of the proposed building and of any adjoining buildings should be supplied to the City Surveyor. The clause states that any person aggrieved by a decision of the surveyor may appeal to the Recorder of the city, whose decision shall be final. The deputation consisted of the following:—Messrs. W. J. Gilliland, W. J. Fennell, W. B. Fennell, N. Fitzsimons, A. T. Jackson, J. St. J. Phillips, and W. B. Blackwood. Mr. Gilliland said he represented the Ulster Society of Architects, and through them the profession in Belfast. The proposed clause was objected to, and the alterations made had not improved matters, but rather the reverse. The City Surveyor was constituted the censor for Belfast in architectural matters, a position which they as architects thought no City Surveyor should occupy. There should be by-laws to assist him in forming his opinion. It might often be very difficult to supply the particulars demanded in regard to neighbouring buildings, the owners of which might be at daggers drawn with the person erecting the new building. The appeal to the Recorder was an illusory form of appeal, being simply an appeal from an opinion, and all arguments would simply leave the matter where it was originally. He hoped they were all working to improve the architectural character of the streets of Belfast, and they again tendered their assistance publicly to the Corporation to help them in framing a clause having this object in view; but they objected to the possibility of an architect's design being vetoed on the mere opinion of the City Surveyor. Mr. W. J. Fennell said they had made a wise regulation as to the thickness of the walls of the buildings in the city, and they ought to have a similar clause as to the height of buildings in ratio to the width of the streets. They objected to the City Surveyor saying, "Thus far and no further," although they did not think Mr. Bretland would take a vexatious view of the clause. The Lord Mayor asked if the deputation had prepared a clause in substitution for the one they objected to. Mr. Gilliland answered in the negative. The Lord Mayor said in case of appeal, the Recorder would hear the evidence and act upon it. The deputation then retired.

ARCHITECTURAL SHAMS.—Mr. E. R. Taylor, head master of the Birmingham School of Art, distributed the prizes at Brightelmston School, Birkdale Park, Southport, on the 14th inst. In his address Mr Taylor spoke of the value of drawing as a part of education. They learned to draw because it was a help to other studies, and another reason was that they might help to lessen the ugliness of to-day. Until about a century ago, he said, all things made by man, from buildings to articles for kitchen use, had in them some element of beauty and fitness, and generally so much of rightness and beauty that the former could not be pulled down without protest, and the latter were gathered into museums. Looking at the two extremes of each, they must admit there were distinct lines of demarcation between beauty and ugliness. In architecture the manor houses and cottages on the Cotswolds, or the half-timber work of Cheshire and Warwickshire, were things of beauty, and in contrast to most of the modern mansions and workmen's cottages. If they admitted that beauty and ugliness were not convertible terms, it was worth while to inquire into the cause of so much of the present-day ugliness. If they looked at Turkey, India, and Japan they would find that good work continued to be produced in these countries until recently. The work, however, was now contaminated by modern European influences, the same influences which had made our work in this country bad. Japan was the most recent and lamentable instance. It had hurried to adopt western ideas of life, and its exhibit at the Glasgow Exhibition was the most melancholy sight there. One cause of this present-day ugliness was the attempt to revive old styles. The notion that we could bring to life dead styles was a misuse of the study of history, and yet it still prevailed. Another cause of bad work was the love of shams—not toleration only, but a real love of shams. When he began work in Birmingham, students and others on showing him their work generally reached the climax of praise by stating it was like something it was not. As an instance of this he cited the treatment of a rubble wall which had a beauty of its own with its irregular mortar joints, which gave a texture to secure which in other things great expense was often incurred. This was spoiled by ruling straight mortar joints at all angles to make it less like rubble work. A final cause affecting all the others was the judgment by money value. This tainted all their work. In closing, he advised them in their pursuit of beauty to study simple and right construction, to study old work to see how it grew, to love nature, the source of all that was beautiful, and to live simply.

FLORENTIAN INDUSTRIES.—In a special report recently made to the Foreign Office by Mr. Percy Chapman, British Consul-General, on the industries of the province of Florence, it is stated that the Florentine mosaic (hard stones) industry, quite a speciality, once enjoying a world-wide renown, is now greatly affected by the competition of inferior mosaics of softer stones, as well as by fashion. The important Government works for hard stones giving employment to twenty-one men, are, however, still in existence. It is calculated that this industry gives employment to 150 hands, including some children under fifteen years. The working of ornamental stones, and especially of Carrara marble and serpentine (*verde di Prato*) holds a considerable place amongst the industries of the province. The working of marble and alabaster into statues and statuettes of an industrial type likewise occupies a considerable number of workmen, partly working at their masters' studios and partly at their own homes. The approximate number of workmen can be no less than 535. This industry, like mosaics, is almost exclusively supported by British and American demand. Of stone quarries there are 202 in actual work in the province, of which four are serpentine (*verde di Prato*), five calcareous stone (*alberese*), two grindstone (*enfotide* or *granitone*), five fireproof stone, three calcareous tuff, 170 "arenaria" (hard grey stone for olive presses), eleven building stone (*pietra forte*), and two majolica earth. The serpentine (*verde di Prato*) serves for architectural and ornamental purposes. These quarries, situated at Monferrato, near Prato, have been worked from a very early date. In 1365 they were taken on lease by the Opera del Duomo to employ the stone in ornamental works on the Cathedral. At present they are in the hands of two private persons, and their output (valued at 1,000*l.* per annum) is almost entirely used in Florence, partly for repairs to the Cathedral and other churches of the city, and partly in making statuettes, bowls, vases, and other ornamental objects. With regard to the calcareous stone (*alberese*), some is cut into flags for street paving, and the remainder is employed in masonry in its original state, or else reduced into chippings and utilised in the metalling of roads. The average output of these quarries may be calculated at about 3,200*l.* per annum. The tuff is utilised as a very common building stone, the greater part being reduced into gravel. The arenaria stone, including the varieties of "macigno" and "pietra forte," enjoys an excellent reputation as a first-class architectural and building stone; the largest output is obtained at Fiesole, Carmignano, Lastra a Signa, and Galluzzo. The Fiesole quarries alone give an approximate annual output of 10,400*l.* The total number of quarries is 1,300. This stone is frequently used outside Tuscany and even exported abroad.

ARBITRATION CASE.—Mr. G. F. Deacon, C.E. the arbitrator appointed to determine the dispute between Messrs. Holme & King and the Merthyr Urban District Council in connexion with the construction of the new reservoir at Upper Neuadd, has issued his award. Messrs. Holme & King in 1875 contracted with the Council to do certain work at the new reservoir, the contract upon a schedule of prices being estimated to amount to about 77,000*l.* They were to quarry the stone and deliver it on the works, and to supply the cement and lime necessary for making the concrete in which the masonry was to be set, the setting of the masonry to be done by men employed on behalf of the Council. The contract was to have been concluded in three years, but there were difficulties in the way of completion within the stipulated term, and the period was extended. The work still lagged, and from time to time the contractors sent in continuously increasing claims to the Council for damages for delay, caused, as they alleged, by their men being kept idle and unable to go on with their work, consequent upon the Council's men not carrying out expeditiously their portion of the undertaking. Eventually the position became so strained that in June last the contractors were relieved of their contract. Messrs. Holme & King then brought up their claim to no less than 37,000*l.* The Council declined to pay, and so the matter under the contract was referred to Mr. Deacon, the consulting engineer, who took evidence in London. The proceedings extended over a month, Mr. Joseph Shaw, K.C., appearing for the Council, and Mr. Leyton, Liverpool, for the contractors. The amount of the award is 2,036*l.*, each side to pay their own costs.—*Western Mail.*

STRAND IMPROVEMENT AWARD.—On the 19th inst. Mr. John Troutbeck, High Bailiff for Westminster, and a special jury sat at the Surveyors' Institution, Westminster, to assess the amount of compensation to be paid by the London County Council to Mr. W. H. Collingridge, of Aldersgate-street, City, for the freehold premises, 17 and 18, Wych-street, Strand, compulsorily acquired for the purposes of the Strand improvement scheme. The jury awarded the claimant 11,084*l.*, including everything. The High Bailiff decided that the claimant had not lodged full particulars of his claim within a reasonable time, so as to allow the Council to make him a proper offer, contrary to Section 12 of the Act. The effect of this was that the claimant pays all his own costs and half the cost of the inquiry.

NEWCASTLE BUILDING TRADE ASSOCIATION.—The annual dinner of the Newcastle, Gateshead, and Tyne District Building Trade Employers' Association was held on the 18th inst. at the County Hotel, Newcastle. The chair was occupied by Mr Walter Lowry, and the vice-chair by Mr. Alex. Pringle. After the loyal toasts, Mr. W. T. Weir proposed the "Mayors and Corporations of Newcastle and Gateshead." The Mayor of Newcastle, in responding, said careful observers must notice that a great transformation was taking place in Newcastle. If the Corporation was encouraged by having the confidence of the ratepayers, Newcastle ere long would be opened out in various directions. Its heart would be extended and its suburbs developed. The main thoroughfares in the heart of the city were too narrow and too few. They required duplicating. He hoped that before long not only would Grey-street be carried up to the Hay Market, but that they should have a great thoroughfare uniting the vast population of Heaton with that of Arthur's Hill. He hoped the Corporation would have sufficient intelligence to secure Singleton House property as a future home for the municipal buildings. If the purchase was delayed, instead of costing 120,000*l.* or 140,000*l*, it might cost them twenty years hence 300,000*l.* Referring to the electric tramways, he said they were putting the cars on the rails as soon as the manufacturers could let them have them. In six months probably they would be fully equipped, and have a two or two and a half minutes' service in the principal thoroughfares. The Mayor of Gateshead also responded. Alderman D. Ranken, Sunderland (President of the Northern Counties Federation), proposed the "Newcastle, Gateshead, and Tyne District Branch of the Northern Counties Federation of Building Trade Employers." He spoke of the unity displayed in Newcastle by members of the building trade, when they held out for nine months against what they believed to be the unfair and unjust demands of the workmen. There were still some firms outside the Building Association whom he thought should throw in their lot with the Federation. He also suggested the advisa-

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bility of getting the foremen to join the employers' society. So long as the foremen remained members of the men's society they would not, as employers, secure the full measure of assistance in carrying out their work which they ought to have. He alluded to the recent articles in the *Times* newspaper and other publications as to the limitation of work on the part of the men. He trusted one effect of the exposure would be that in future the men would do a fair day's work for a fair day's wage. The President (Mr. Walter Lowry), who responded, was received with musical honours. He spoke of the very large number of bankruptcies which there had been in the building trade throughout the past year. There were two reasons why they occupied this unfortunate position. The first reason was that people entered the building trade with too little capital, and the second reason was that they did not know the proper prices to put down to cover the work they had to do. Referring to the subject of the restriction of output, as mentioned by Alderman Ranken, he said the doctrine that if three men did the work of two it would make employment for another man was a foolish argument, which could only rebound on the heads of those who made it. They had seen the finish during the year of one of the most disastrous strikes known in the building trade for a long time. It was an extraordinary thing that a body of men should have the power to dislocate the whole trade throughout the North of England for nine months. He hoped the time was not far distant when some other method would be established for settling disputes. He felt hopeful that in the future conciliation would play an important part, and he instanced the success of the Conciliation Act in New Zealand.

SOUTH WALES BUILDING TRADES FEDERATION.—A meeting of this Federation was held at the Master Builders' rooms, 10, Dynevor-place, Swansea, the President, Mr. W. Thomas (Cardiff) presiding. Letters were read with reference to the Foremen's Association. It was resolved that the secretaries of the various associations affiliated should be written to for a complete return of their members, together with the amount of wages paid by each member during the last twelve months, this return to be sent in by the last week of January or the first week of February. In accordance with the resolution passed at the previous meeting held at Cardiff, the Swansea delegates submitted the draft of the new rules which this Association had drawn up, and intended offering the Plasterers' Society in May next. After a long discussion they were eventually approved of, subject to a few alterations, and certain power was given the Swansea Association for dealing with same. It was resolved to adopt the crest submitted by the National Association, and that each association affiliated with this Federation be advised to obtain one. Resolved that the next meeting be held at Newport about the first week of March, date to be arranged by the President and secretary.

LEGAL.

BRADFORD ARCHITECT'S CLAIM.

AT the West Riding Assizes, Leeds Town Hall, on the 18th inst., before Mr. Justice Ridley, an action was brought by Mr. Wilson Bailey, architect, of Bradford and Keighley, to recover 171*l.* 3s. from Mr. James Longton, schoolmaster, of Keighley, for services rendered. The defendant had paid 87*l.* 1s. 11d. to the plaintiff, and brought into court a further sum of 5*l.* 4s. 6d., which sums, he contended, were sufficient to satisfy the claim. Mr. Scott Fox, K.C., and Mr. Waugh appeared for the plaintiff; and Mr. E. Tindal Atkinson, K.C., and Mr. Compston defended.

In opening the case, Mr. Waugh said that the claim was for services rendered in respect of the preparation of plans, the getting out of quantities, and the obtaining of tenders for certain houses which the defendant contemplated building in Highfield-lane, Keighley. The defendant's intention at first was to build seven houses on the back portion of the land. The plaintiff prepared plans for these, and then the defendant said he would build five houses on the front portion. The defendant instructed the plaintiff to put all the sculleries on the left-hand side of the houses, and then he had the sculleries of the first and third houses reversed, which necessitated fresh plans. The plaintiff then obtained tenders from builders for the erection of these houses. Later the defendant decided to have fresh plans prepared with the sculleries inside the houses. The defendant continued to change his mind, and finally decided not to build. The defendant set up in defence an agreement in writing, dated January 7, 1898, alleging that in this the plaintiff estimated the cost of the buildings at 2,256*l.* 10s., that when the tenders were obtained they amounted to 3,206*l.*, and that by reason of that fact the services became wholly worthless. The defendant further said that the plaintiff did not prepare a second set nor obtain further tenders, or if he did the cost was 3,100*l.*, which was far more than the estimate.

Mr. Compston intimated that liability was not denied, the sole question being as to the amount which the plaintiff was entitled to.

Mr. W. J. Morley, architect, Bradford, said that he considered the plaintiff's charges for the work were low. The Institute's charges would have been about 300*l.* Mr. Sugden, architect, Keighley, said that his charges for the same work would have been over 200*l.*

Called on behalf of the defendant, Mr. John Connon, architect, Leeds, declared that a fair remuneration for the work done would be about 93*l.*; and Mr. Charles France, architect, Bradford, said that he thought the amount the defendant had paid into court, 92*l.* 6s. 5d., was reasonable remuneration.

The defendant said that in 1887 Mr. Bailey had built for him a number of houses on the Highfield-lane plot. He intended building other houses on the same plot in 1898, and entered into an agreement with Mr. Bailey for the preparation of plans at 5 per cent. on the cost of the houses. He had every wish to pay the plaintiff fairly for the work he had done.

His Lordship found for the plaintiff for the amount claimed, holding that there was no agreement in regard to the cost of the houses.—*Yorkshire Post.*

ALLEGATIONS AGAINST BIRMINGHAM ARCHITECTS.

AT the Birmingham Assizes last week, before Mr. Justice Kennedy and a special jury, the case of Forbes and Charles *v.* Lloyd was concluded. Mr. Hugo Young, K.C., and Mr. McCardie appeared for the plaintiffs; and Mr. A. T. Lawrence, K.C., and Mr. Stubbins for the defendant. The plaintiff Charles was a builder, and Forbes and the defendant were architects, and the action was brought to recover damages for libel. The statement of claim alleged that before the month of May, 1900, the plaintiffs prepared ground plans for the erection of an arcade and theatre upon the site of the Theatre Royal, and a description of the plans was published in the *Daily Argus* on October 4, 1901. On October 8 the defendant, in a letter to Mr. F. S. Bolton, falsely and maliciously wrote and published of the plaintiffs, *inter alia*, the words following:—"Your architect and builder have practically appropriated in its entirety my scheme." And on October 15 the defendant wrote to the editor of the *Birmingham Daily Mail*, and caused to be published in the issue of that paper of that date a letter repeating the accusation in different terms. The defence was simply a denial of the matters alleged. It appeared that some time before the defendant prepared plans and submitted them to certain gentlemen who were endeavouring to form a syndicate to acquire the site in question, which, however, was ultimately secured by Mr. Bolton, who employed the plaintiffs as builder and architect, and they prepared ground plans, and published them as stated. Before their publication the defendant saw the plaintiff Charles, and tried to get plaintiffs to purchase his plans for 100 gs., and to have him appointed as architect, but they did not fall in with these proposals. The defendant, in his evidence, reasserted his belief that the plaintiffs had appropriated his ideas. He was also allowed to give evidence in mitigation of damages as to the alleged close resemblance of the two plans. The plaintiffs denied on oath that they had seen the defendant's plan at all before they prepared their own. The jury found for the plaintiffs; damages, 50*l.*, to Charles and 25*l.* to Forbes.

LAVATORY ACCOMMODATION.

AT Lambeth Police-court, on the 19th inst., the South-Eastern and Chatham Railway Company were summoned, at the instance of Mr. J. S. Pointon, a sanitary inspector in the service of the Camberwell Borough Council, to answer the complaint that there was an insufficiency of lavatory accommodation at their station at Nunhead, Mr. G. W. Marsden, solicitor to the council, supported the summons on their behalf and said the proceedings were instituted under Section 37 of the Public Health (London) Act. Nunhead Junction was a station at which a very large traffic was done. There were 1,000 season-ticket holders, and in addition the station staff and a number of coal porters working at the adjacent coal siding had to be accommodated. The council were of opinion that the lavatory accommodation provided was insufficient, and they had been in communication with the company, who had, however, absolutely refused to provide any further accommodation. He submitted that the station was a "building or house" within the meaning of the section. Mr. Alexander Glen, who appeared for the company, said the main question that arose in this case was whether the provisions of the statute in question applied to a railway station which was erected under the powers of a special Act of Parliament. Inspector Pointon and Dr. Stevens, Medical Officer of Health for Camberwell, having given evidence in support of the summons, Mr. Glen pointed out that the notice served by the Council was in general terms and did not say what accommodation was necessary. Mr. Francis: Do you want this case to go off upon a technicality or are you prepared to do anything? Mr. Glen said he took the point that the notice was not sufficient, and he also took the more important point that the station was built in pursuance of the special Acts of the railway company, and that the Act under which these proceedings were taken did not apply. Mr. Francis.—In other words, you say I have no jurisdiction in this matter. Mr. Glen.—In the first place, that the Local Authority have no jurisdiction, and that, therefore, it follows that they have no power to enforce compliance with their requirements in this court. In the course of some further discussion, Mr. Glen mentioned that the company contemplated rebuilding the station, and, consequently, did not want to go to any large expense in regard to the present structure. Eventually the further hearing of the case was adjourned for a fortnight, with a view to an arrangement between the Council and the company.—*Times.*

ANCIENT LIGHT DISPUTE IN FINSBURY

MANDATORY INJUNCTION AGAINST A BUILDER.

THE case of the Home and Colonial Stores *v.* Colls came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Cozens-Hardy, on the 20th inst. for judgment on the appeal of the plaintiffs from an order of Mr. Justice Joyce in the Chancery Division on December 20, 1900. The case was fully reported in the *Builder* of December 8 and 29, 1900.

The facts were shortly these:—The plaintiffs are an incorporated company having a number of shops in different parts of the country, and brought the present action to restrain the defendant from erecting a proposed building so as to obstruct the plaintiffs' ancient lights. The premises in question were the head offices of the plaintiffs, situate in Worship-street, City. The plaintiffs' building was situated at the corner of Paul-street and Worship-street, but the only part concerned in the action was the Worship-street frontage. The plaintiffs were lessees of the premises from the Ecclesiastical Commissioners. The defendant was a builder, and also lessee of premises which he was erecting on the opposite side of the road, which was about 41 ft. wide. The premises which formerly stood on the site were 19 ft. 6 in. in height, and the defendant proposed to erect a building to a height of 42 ft., which the plaintiffs said would obstruct their lights. The main question to be decided was as to the apprehended injury to the light coming to the windows on the ground floor of the plaintiffs' premises, the portion of the ground floor opposite the defendant's premises being used as an office. It consisted of a large room 11 ft. 10 in. high and of unusual depth, the back wall being upwards of 50 ft. from the Worship-street front, and it had no window nor source of natural light at the back. This room, which was used by clerks in the plaintiffs' employ, was fitted with electric light, and the result of the evidence given at the trial was that it was the custom to use the electric light in the back part of the room on most days. The windows on the ground floor were of large size, the uppermost part of each window being filled with coloured glass to a depth of 20 in. from the top, and there were wire blinds fixed at the bottom of each window. At the trial a great amount of expert evidence was given, and it was practically admitted by the plaintiffs' witnesses that the defendant's building might be raised to a height of 25 ft. from the ground without any material injury to the plaintiffs. Mr. Justice Joyce was of opinion that there was no evidence to show that any extraordinary amount of light from the Worship-street windows had been enjoyed for anything like the twenty years, and that the proposed new building of the defendant would not affect the selling or letting value of the plaintiffs' premises. He said that it erected to the proposed height of 42 ft. no part of the defendant's building would be high enough to reach any line drawn at an angle of 45 deg. to the horizon from any point in the base or sill of either of the windows in question belonging to the plaintiffs. But he thought the defendant's building would for its width of 30 ft. directly south of these windows cut off a portion of the sky area then visible from within the plaintiffs' office, and would, he thought, to some extent necessitate the more frequent use of artificial light in the front part of the office. Apart from any question with respect to the back part of the plaintiffs' premises and to the extraordinary amount of light required therefor in the absence of illumination by artificial light, the plaintiffs' premises would still, in his lordship's opinion, after the erection of the defendant's building be well and sufficiently lighted for all ordinary purposes of occupancy as a place of business. In his lordship's opinion, the plaintiffs' premises were unusually well lighted. If, however, as the plaintiffs contended, they were always entitled to the full amount of light they then enjoyed, they would have a good cause of action, although it might be doubted whether the diminution of light to their building by the defendant's proposed building would entitle them to an injunction. The learned Judge came to the conclusion that he must follow the decision of Mr. Justice Wright in the case of "Warren and others *v.* Brown" (reversed on appeal on the 13th ult. This leading case was reported in the *Builder* of August 11, 1900, and November 2 and 16, 1901) and dismissed the action with costs. Hence the present appeal of the plaintiffs.

Immediately after his Lordship's judgment, the plaintiffs gave notice of appeal, whereupon the

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defendant proceeded with the completion of his building.

The arguments on the appeal were heard on December 2 and 3, when their lordships reserved judgment.

Mr. Hughes, K.C., and Mr. W. E. Vernon appeared for the appellants, and Mr. Bray, K.C., and Mr. O. Leigh Clare for the respondent.

Lord Justice Cozens-Hardy read the judgment of the Court, which was to the following effect:—The appeal, he said, raised a question as to the nature and amount of evidence required to entitle a plaintiff to relief by way of injunction for the protection of ancient lights. The action was tried before Mr. Justice Joyce in December, 1900. That was important, because at that date it had been laid down by Mr. Justice Wright, in the case of Warren and others *v.* Brown, that the owner or occupier of a house had no legal right of action so long as he had left to him as much light as is ordinarily required for habitation or business, even though he has been deprived of a substantial amount of light, and has thereby suffered substantial damage. That view of the law was accepted by the defendant's counsel in the cross-examination of the plaintiffs' witnesses and in the examination of the defendant's witnesses, and as the Court read the judgment was adopted by Mr. Justice Joyce. Mr. Justice Wright's decision had recently been reversed by that Court, and the true rule of law with reference to the interference with ancient lights had been authoritatively laid down thus:—"If ancient lights are interfered with substantially, and real damage thereby ensues to tenant or owner, then that tenant or owner is entitled to relief." In this sentence "substantial" did not indicate any particular percentage. In the case of Back *v.* Stacey it was laid down that, in order to give a right of action and sustain the issue, there must be a substantial privation of light, sufficient to render the occupation of the house uncomfortable, and to prevent the plaintiff from carrying on his accustomed business (that of a grocer) on the premises as beneficially as he had formerly done.

Continuing, his lordship said that without substantial interference there was no right of action, and, in addition, in order to obtain an injunction the plaintiff must establish substantial injury, suffered or threatened. There was no standard or fixed amount of light to which alone a plaintiff was entitled. He must not be fanciful or fastidious. He must recognise the necessity of give and take in matters of this nature. But there might be real damage to the owner or occupier of a building used for particular purposes, or reasonably adapted for particular purposes, although there would be no real damage if the building were not used or reasonably adapted for such purposes. The application of these principles was far more easy when the building which was complained of was erected and damages only were claimed, but they had to be applied when the plaintiff came for an injunction before the building had been erected. It was the duty of the Court to arrive at the best conclusion it could upon the effect which the proposed building, if erected, would produce, and if the Court was satisfied that in that event the plaintiff was entitled, as a matter of right, to an injunction to prevent the defendant from interfering with his ancient light, or in other words to restrain the defendant from committing a wrongful act. The difficulty of applying the rule in a *quia timet* action might well induce the Court to scan the plaintiffs' evidence with severity, especially where an angle of 45 deg. was left. It was settled that there was no rule of law that a man might always build up to an angle of 45 deg., but, in judging of the probable effect of a proposed building the Court might not unreasonably regard the fact that an angle of 45 deg. would be left as *prima facie* evidence that there would be no substantial interference, and might require this presumption to be rebutted by satisfactory evidence. That seemed to be the result of the authorities. It remained to apply those general principles to the present case. His lordship then referred to the evidence, and said with regard to the large clerks' room on the ground floor it was impossible to hold that the plaintiffs would not suffer "real damage" if they had to consume and pay for more electric light than hitherto. As this Court read the judgment of Mr. Justice Joyce it was a finding in favour of the plaintiffs that real damage would result, though light enough would be left for ordinary purposes of occupancy as a place of business, and there was no finding that the interference was not substantial. In the opinion of the Court, on the balance of evidence, substantial interference and "real damage" would result; and the proper judgment would have been to grant an injunction in the settled form known as the Yates *v.* Jack form. But immediately after the action was dismissed with costs the plaintiffs gave notice of their intention to appeal. Notwithstanding this the defendant had proceeded with and completed the erection of his building. Under those circumstances there was only one course open to this Court, and that was to reverse the judgment of Mr. Justice Joyce and grant a mandatory injunction requiring the defendant to pull down anything erected in breach of the terms of the injunction, the defendant to pay the costs in that Court and in the Court below.

Lord Justice Vaughan Williams said that he wished to add for himself that, so far as the rule of 45 deg. was concerned, he doubted very much whether that rule, as the law was now settled, could be regarded even as a rough measure of the right of the owner or occupier of ancient lights.

Their lordships, on the application of Mr. Bray, suspended the operation of the injunction for a certain time to enable the defendant to lodge an appeal to the House of Lords.

A LEEDS FIRM'S COPYRIGHT CATALOGUE.

IN the Chancery Division on the 20th inst., before Mr. Justice Joyce, the Farnley Iron Co., Ltd., were granted an injunction restraining Messrs. Warrington & Son, of Berry Hill Works, Brook-street, Stoke-on-Trent, from printing and publishing any catalogues, &c., containing any plates or illustrations, or tabulated lists of bricks copied from or being a colourable imitation of those in the plaintiffs' book called "Farnley Price List—Glazed Brick Section."

Mr. Manby, for the defendants, said his clients had undoubtedly copied the catalogue unwittingly, and they submitted to the injunction.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

15,187.—A LIFT-VALVE FOR BATH AND LAVATORY SERVICE: *M. M. Brophy.*—The projecting flange of the casing has a screwed cap and inclined edges, projections from the valve which slides in the cap fit with the inclined edges, and also engage with slots in the top disc, which is forced away from the valve with a coiled spring; the valve is opened or closed with the turning of the handle, which causes the projections from the valve to slide upon the inclines.

15,230.—AN APPLIANCE FOR TELEGRAPH AND OTHER POSTS: *L. K. Forsythe.*—Concrete bases for posts are fashioned with cross-sections and with ties, set lengthwise, of flat or angle section, upon their faces or angles at the bottom. The ties, which are bolted in position, may be joined underneath. The post is fastened in its footing with clamping-rings or with cross-tie bolts.

15,230.—A CLIP-AND-SLEEVE JOINT: *L. W. Bates.*—A flexible connexion has a protecting sleeve composed of coils in the form of wire fabric, whereof the axes lie in planes that are perpendicular to the axis of the sleeve, which is secured to the connexion with bolts and straps, a strip of leather being interposed. A similar fastening is used for attaching the pipe ends to the connexion.

15,267.—A CONTRIVANCE FOR USE WITH BALL-AND-FLOAT VALVES: *A. Hill.*—The inventor's object is to help the action of the float as it rises and closes the valve. He causes the valve-spindle to project above the casing, and loads it with weights, which will expedite the closing of the valve, and can be altered in their amount with a variation in the pressure.

15,322.—ADJUSTMENT OF SKY-LIGHTS: *A. Mönnig.*—Ventilation is obtained, and rain and snow are excluded, by means of a set of louvres or Venetian laths, within which the skylight is placed. The frame of the louvres rests, under normal conditions, upon the projecting frame, and is pivoted upon the axis of the skylight, which, together with the louvre-frame, can be turned clear of the window-frame. A stay-rod serves for adjusting the opening of the skylight within the louvre-frame.

15,328.—A FIRE-EXTINCTEUR: *A. C. Badger.*—Vertical wires, having projecting feet, carry the acid-bottle. They are encompassed with a ring, and are bent against the shoulders of the bottle. The stopper—which will fall out when the bottle is inverted—has a guide made of wires that hangs from a ring screwed on to the edge of a disc, which is screwed on to a plug beneath the capping, whereby one can adjust the height of the outer cage, in order that it may bear against the shoulder of the bottle. In another form the carrying wires are not bent inwards against the bottle.

15,344.—A SEPARATOR FOR CEMENT, &C.: *W. F. Goreham.*—For purposes of testing, the glass container, which has a small metallic cone at its base, is pressed against an india-rubber ring, whilst compressed air is forced into it from the serrated end of a tube down a branch of which the fine particles are carried, and so to the expansion chamber. The specification extends to apparatus upon a somewhat larger scale, in which the receiver is set at an inclination from the feed to the tail-end, and is fitted with helical feed and discharge arrangements.

15,349.—A GUARD FOR WOOD SAWING AND PLANING MACHINES: *E. L. Dutton.*—A curved steel blade or riving knife which covers the back of a circular saw, and a front guard of aluminium or other metal, are pivoted to a pin upon an adjustable arm. A link, which is clamped to one end of a lever attached to the pin, will adjust the guard to the cut, and a screw in the other end of the lever will adjust the knife. In the case of a hand-feed planing machine, a guard mounted upon a pivoted arm that is pressed against the fence with a spring, covers the cutters, and the guard is forced aside by the work in passing over the cutters.

15,352.—BRICKS, BLOCKS, SLABS, &C., FOR BUILDERS' USE: *T. Rouse.*—These are fashioned with a central body, core, or part of lime-concrete faced with cement-concrete; the former material being composed of unslaked lime mixed with sand, gravel, pulverised stone, clinkers, slag, and so on, and steam in a closed mixer; and the latter material of Portland or other cement mixed with sand, broken granite, &c., and wetted with steam or water. The articles are pressed in moulds and subjected to steam or vapour at 212 deg. Fahr., to ensure a union between the two materials and to render the lime-concrete weatherproof.

15,388.—CONCRETE FLOORS: *M. Koenen.*—The ribs are laid upon wooden beams that are sustained in part with suspension or tie rods, and repose upon the lower flanges of the girders. The ceiling is secured to the beams which will sustain the temporary arching centres.

15,390.—A CONTRIVANCE FOR DOMESTIC FIRE-PLACES AND HEARTHS: *B. A. Lillie.*—For utilising waste heat a casting which has a covering of glazed tiles is inserted under the bars of the grate, underneath the bars at the back is fitted a triangular fire-brick, and sloped cross-strips of metal which are disposed immediately under the bars serve to turn the waste heat into the hollow hearth.

15,395.—HOT-WATER APPARATUS FOR SWIMMING-BATHS, VATS, &C.: *J. Stott.*—Pipes join a cylinder to the bath or tank, opposite to one of them is the water-supply pipe, and between the steam-pipe and the base of the cylinder is a pipe, fitted with a valve and fixed in such a manner that when the steam-valve and the water-pipe are closed the body of water will circulate and become re-heated by an auxiliary supply of steam.

15,416.—IMPROVEMENTS FOR CRANES: *H. A. L. Barry.* — As an improvement of the invention No. 20,606, of 1899, the hoisting-rope is secured to a link, which is hung from a lever having at its free end a pawl on the axle of a spring-drum, on which is wound a rope attached to the fall-block. Beneath that lever is pressed another pivoted lever, of which the other end carries a weighted pawl that will engage with a spur-wheel upon the axle of one of the carriage wheels. Side-links join the pulley of the fall-block to the hook—both being free to move in a slot in the fall-block to which is pivoted a lever which is also pivoted to an extension of one of the links. Whilst the carriage is at rest the spring in the drum is overpowered by the weight of the fall-block so that the plunger will be sustained as lifted, but in lowering, together with a retrograde movement of the carriage, the weighted pawl will lift the first-named lever through the second-named lever so as to free the first-named pawl for its engagement with a wheel and to stop the paying-out of the rope together with the fall of the fall-block. The inventor further contrives that the plunger shall be moved downwards in relation to the hook for engagement with a trigger-lever and dumping of the bucket, and that, in a variant form, the tripping-plunger shall be automatically worked with a cam upon the pulley-axle of the fall-block after the load has been raised, carried to the point of discharge, and lowered.

15,432.—MANUFACTURE OF PORTLAND CEMENT: *A. Gibb.*—The inventor substitutes peroxide of iron for the customary shale or clay, in order that the materials may be fused without the employment of less than 60 per cent. of lime. He also uses baryta as carbonate or silicate, &c., for the lime, in part, and for making the cement recommends sandstone, or sand, chalk, or limestone, with the residue derived from extracting copper from burned pyrites known as purple ore, and, it may be, clay, to be wetted and fashioned into small lumps; the melted product is granulated in water, drained, dried with the waste heat from the furnace, and then ground. For the furnace, which should have an oxidising flame, confer No. 11,301 of 1900.

15,446.—CONCRETE WALLS AND PARTITIONS: *G. L. Mouchel.*—Metal bars are embedded in the concrete, so as to afford resistance against thrusting and shearing. The outer walls of a silo are built up of slabs, which are inserted between grooved pillars of concrete or of iron, and have their upper and lower edges tongued and grooved, metal rods being used for strengthening purposes. During the progress of the work concrete beams are moulded between the pillars over the slabs, from time to time, and grout is run into the joints. Other adaptations are specified.

15,453.—FIREPROOF FLOORING: *L. Pitsch.*—For constructing fireproof floors are devised slabs or blocks, having recesses in them, which are to be laid upon girders and ribbed joists, and to be embedded in concrete or cement.

15,501.—BURNERS FOR BLOW-PIPES: *T. Fletcher, A. Neil, and Fletcher, Russell, & Co.*—The Bunsen burners are intended for use in small "blast furnaces," more particularly those that serve for experimental purposes and are equipped with crucibles; for a protection of the gauze from the heat of the furnace after the blast has been turned off the gauze-plate is fitted with a guard-cap or cover.

15,521.—A CONTRIVANCE FOR THEODOLITES: *H. D. Hoskold.*—To enable one to take observations down a shaft by turning the telescope into a vertical position, the vertical axis of the theodolite is made hollow, and in order that the telescope shall clear the plate (the length of the standards not having

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*New Club House	Royal Norfolk & Suffolk Yacht C.	25*l.*, 20*l.*, 15*l.*	No date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Granite Road Metal	Newmarket U.D.C.	S. J. Ennion, Deva Chambers, Newmarket	Dec. 31
Sewers, Little Thurrock	Orsett R.D.C.	R. T. Stewart, Surveyor, Council Offices, Orsett	Jan. 1
*Making-up Catisfield-road	Enfield U.D.C.	Council's Surveyor, Court House, Enfield	do.
Sewerage Works	Marlborough (Wilts) Town Council	Fairbank & Son, Civil Engineers, 13, Lendal, York	Jan. 3
Wrought-iron Railings, &c.	Branksome (Dorset) U.D.C.	W. H. Curtis, Council Offices, Branksome	do.
Flint and Granite Road Metal, &c.	West Sussex County Council	W. B. Purser, Civil Engineer, 4, Worthing-road, Horsham	Jan. 4
Street Works	Wolverhampton Corporation	G. Green, Borough Engineer, Town Hall, Wolverhampton	do.
26 Blocks of Buildings at Hospital, Seacroft	Leeds Corporation	E. T. Hall, Architect, 54, Bedford-square, W.C.	do.
Masonry Work, Walls, &c.	Cardiff Corporation	W. Harpur, Civil Engineer, Town Hall, Cardiff	do.
Office Buildings, Edinburgh	Mid-Lothian County Council	J. M. Henry, Architect, 7, South Charlotte-street, Edinburgh	Jan. 6
Excavating Works, Foundations, &c.	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, North Shields	Jan. 7
Schools, Kingsland	Holyhead School Board	R. E. Pritchard, Bradford House, Holyhead	do.
Hospital, Low Black Close, near Morpeth	Aslington U.D.C.	A. Wood, Surveyor, Market-place, Aslington	do.
*Steam Road Roller and Road Scarifier	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Broken Granite and Flints	Kingston-on-Thames Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames	Jan. 8
*New Cells and Cubicles, Alton Police Station	Southampton Corporation	County Surveyor, The Castle, Winchester	do.
Car Depot, Roath	Cardiff Corporation	W. Harpur, Civil Engineer, Town Hall, Cardiff	Jan. 9
Street Works, Glebe-street	Castleford U.D.C.	W. Green, Surveyor, Council Offices, Castleford	do.
*Rendering Baths Watertight & Reconstructing Drain	Hampstead Council	Borough Engineer, Town Hall, Hampstead	do.
School, Alltwen, Wales		W. W. Williams, Architect, 63, Wind-street, Swansea	Jan. 15
*Enlargement of Head Post Office, Plymouth	Commissioners of H.M. Works, &c.	Secretary's Office, Storey's Gate, S.W.	do.
*Widening London Bridge	Corporation of London	City Surveyor, Guildhall	Feb. 17
Cemetery Building Works, Stourbridge-road	Dudley Corporation	Borough Surveyor, Town Hall, Dudley	No date
Six Houses, Garden-street, Castleford, Yorks.	Mr. T. Illingworth	Garside & Pennington, Architects, Ropergate, Pontefract	do.
Bungalow, Aldwick, Bognor		Hall & Co., Architects, 10, Gray's Inn-square, W.C.	do.
Sewers, &c., Netherton	Dudley Corporation	Borough Surveyor, Town Hall, Dudley	do.
Chapel, Feilbeck, near Pateley Bridge		W. J. Morley & Sons, Architects, 269, Swan-arcade, Bradford	do.
Drainage Works at Police Station, Alnwick		J. Cresswell, County Surveyor, Moot Hall, Newcastle-on-Tyne	do.
Schools, St. John's-place, Northgate	Canterbury School Board	W. J. Jennings, Architect, Canterbury	do.
Footpaths, &c., Walton, Liverpool		F. H. Peate, Architect, 11, South Castle-street, Liverpool	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of the Works	Warwick Guardians	3*l.* per week	Jan. 1

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. & x. Public Appointments, pp. xvii.

been increased) it is caused to slide in a sleeve that is fitted with stopping-pieces.

15,562.—Bar-fencing: *T. W. Palmer.*—For enabling one to adjust vertical bar-fencing upon inclined ground, the horizontal rail, which should have a channel-section, is fastened near the ground to uprights. The ends of the vertical bars are then passed through holes in the upper flange of the rail and so to the lower flange. The bars have shoulders which take the upper rail (having a U-section) that is passed over them. For each panel, or space between two standards, a bar is passed through a hole in the upper rail, and its lower and threaded end is also passed through the upper flange of the horizontal rail.

15,538.—A Bracket or Stage for Use with Ladders: *L. Troppmann.*—The hooks of the two slotted pierced bars are adapted for engagement with the ladder-rounds, and, being joined to one another with a screw and wing-nut, are clamped on to the side of the ladder, so that they will form a support for a platform or staging. The apparatus can be used to prevent a workman, or his tools, &c, from falling off a ladder that is laid upon a roof.

15,561.—A Trap for Gulleys: *W. Oates.*—On the side of the gulley is fashioned a small chamber, and an opening communicates from one to the other. At the top of the chamber is an outlet which a sliding plate, that is in engagement with sloped grooves, keeps separated from the inlet, and which is coned from both sides, so that the discharge pipe may be adjusted anglewise, and also may be grooved for cementing purposes.

15,568.—Ventilation of Walls: *H. F. Einfeldt.*—To keep the walls dry and prevent the spreading of dry rot or fungus, they are built with hollowed bricks that are laid so that their openings shall constitute continuous ventilation-shafts and air-flues. The bricks are made in different shapes; some have middle stiffening-ribs, and others are fashioned in an angular form for gable-ends.

15,632.—Tops for Chimneys and Ventilation Shafts: *O. H. Champagne & F. B. Tanguay.*—The central spindle supports a top that rotates around the up-take, and at the same time drives a fan which is attached to a sleeve within the up-take. The speed-gearing, provided with ball-bearings, comprises a pinion upon the sleeve of the fan, with intermediate pinions upon pins in a stationary basin, and a ring-wheel around the spindle.

MEETINGS.

Friday, January 3.

Architectural Association.—Mr. J. A. Gotch on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century," illustrated by lantern views. 7.30 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 13.—By Farebrother, Ellis, & Co. (at Kingston).

Kingston-on-Thames, Surrey.—Burton-rd., nine plots of freehold building land	£663

December 14.—By Norman & Son (at Hertford).

Puckeridge, Herts.—7 to 18, Ashton's-gardens, f. Main-rd., 23 freehold building plots	1,435
	318

December 16.—By Francis Dod & Co.

Clapton.—104, Northwold-rd., u.t. 79½ yrs., g.r. 5*l.* 10*s.*, r. 36*l.*	390

By Heaps, Son, & Reeve.

Islington.—Union-sq., l.g.r. 68*l.* 5*s.*, u.t. 25½ yrs., g.r. 24*l.* 7*s.* 6*d.*	530
55, Packington-st., u.t. 35 yrs., g.r. 6*l.* 6*s.*, r. 55*l.*	415
Finsbury Park.—22, Upper Tollington Pk., u.t. 72 yrs., g.r. 6*l.* 15*s.*, e.r. 4*l.*	515

By Batchelar & Son (at Woking).

Horsell, Surrey.—Woodham-rd., Wellington Lodge and 1a. 0r. 35p., f.	2,475

By Hollis & Webb (at Leeds).

Roundhay, Yorks.—The Drive, &c., a block of freehold building land, area 10,600 yards	1,325

By December 17.—David Burnett & Co.

Hornsey.—44, Linzee-rd., u.t. 95½ yrs., g.r. 7*l.*, r. 40*l.*	485

By Farebrother, Ellis, & Co.

Hackney.—Ash Grove, f.g.r 47*l.* 14*s.*, reversion in 24½ yrs.	£2,020
Dalston.—Queen's-road, i.g.r. 32*l.* u.t. 27 yrs, g.r. 4*l.*	355

By Henry Hooper.

Clapham.—59, 61, and 63, Larkhall-lane, u.t. 35½ yrs., g.r. 8*l.* 10*s.*	975

December 18.—Foster & Cranfield.

Leslie, &c., Fifeshire.—The Inchdairnie Estate, 2,228 a. 2 r. 37 p., f. (including minerals)	66,000
Burntisland, Fifeshire.—The Grange Estate (including stone quarry), 461 a. 0 r. 11 p., f.	19,000
Saline, Fifeshire.—The Saline and Knock and Lethans Estate, 2,188 a. 0 r. 26 p., f. (including minerals)	38,000
Cardenden, Fifeshire.—The Balgreggie Estate, 602 a. 0 r. 37 p., f. (including minerals)	46,000

By Drivers (Holloway).

Holloway.—Hornsey-rd., &c., f.g. rents 30*l.*, reversion in 14¾ yrs.	800
George's-rd., f.g.r. 60*l.*, reversion in 58 yrs.	1,500

By Herring, Son, & Daw.

Streatham.—34 to 50, 60 to 70 (even), Besley-st.; also the Oxford Arms p.-h., f., r. 320*l.* 10*s.*	3,630

Inman & Crier.

Holloway.—Queen's-cres, the Marquis of Salisbury p.-h., &c., f.g.r. 122*l.*, reversion in 55 yrs.	3,400

By Rushworth & Stevens.

Pimlico.—31, Lower Belgrave-st., and piece of land adjoining, u.t. 7¼ yrs., g.r. 7*l.*, r. 100*l.*	390
35, Lower Belgrave-st., u.t. 7¼ yrs, g.r. 3*l.* 10*s.*, r. 36*l.*	170
30, Commercial-rd., r. 36*l.*; also i.g.r. 5*l.*, u.t. 12 yrs., g.r. 10*l.*	155
43, Warwick-st., u.t. 22¾ yrs, g.r. 4*l.*, r. 65*l.*	920

By C. P. Whiteley.

Sidcup, Kent.—Half Way-st, Ye Old Black Horse p.-h.; also house adjoining, f, r. 100*l.*	3,000
Blackfriars.—40, Broadwall, c, r. 39*l.*	300

By German & German (at Ashby-de-la-Zouch).

Ashby-de-la-Zouch, &c., Leicester.—Portions of the Donington Estate, comprising enclosures of land, building sites, houses, cottages, &c., area about 160 a., f. (in numerous lots)	37,350

December 19.—By C. Rawley Cross & Co.

Acton.—8, Gunnersbury-lane, u.t. 96 yrs., g.r. 7*l.* 15*s.*, r. 45*l.*	58

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11, Denehurst-gardens, u.t. 96 yrs., g.r. 7*l.* 10s., r. 42*l.* £450
Shepherd's Bush.—60, Wendell-rd., u.t. 77 yrs., g.r. 6*l.*, e.r. 36*l.* 340

By H. DONALDSON & SON.

Dalston.—58 and 60, Malvern-rd., u.t. 44 yrs., g.r. 10*l.*, r. 72*l.* 790
Commercial-road East.—No. 374, f., r. 55*l.* 955

By LANGRIDGE & FREEMAN.

Bromley-by-Bow.—138 to 144 (even), St. Leonard-st., f. 660

By NEWBON, EDWARDS, & SHEPHARD.

Shepherd's Bush.—21 and 23, Stowe-rd., u.t. 61½ yrs., g.r. 20*l.*, r. 80*l.* 645
Marylebone.—12, Nottingham-st., u.t. 8½ yrs., g.r. 38*l.* 300
Holloway.—216 and 218, Holloway-rd., f., r. 95*l.* .. 1,670
1 and 2, Slaney-pl., f., r. 38*l.* 4s. 500
7, Drayton Pk., u.t. 62 yrs., g.r. 8*l.*, r. 58*l.* 580
Kingsland.—9, Little Essex-st., u.t. 67 yrs., g.r. 4*l.* 15s., r. 40*l.* 410
Westbourne Park.—50, St. Luke's-rd., u.t. 55 yrs., g.r. 10*l.*, r. 68*l.* 430
Islington.—3, Hardinge-st., u.t. 29½ yrs., g.r. 6*l.*, r. 31*l.* 10s. 305
Finsbury.—10, Holywell-row, f., r. 30*l.* 720

By HENRY HENDRIKS (at Birmingham).

Sparkbrook, Worcester.—113 to 119 (odd), Stoney-lane, u.t. 89 yrs., g.r. 15*l.* 650

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 12 0	per 1,000 alongside, in river.	
Rough Stocks and Grizzles	1 10 0	"	"
Facing Stocks	2 12 0	"	"
Shippers	2 8 0	"	"
Flettons	1 8 0	"	at railway depôt.
Red Wire Cuts	1 12 0	"	"
Best Fareham Red	3 11 0	"	"
Best Red pressed Ruabon Facing.	5 5 0	"	"
Best Blue Pressed Staffordshire	4 6 6	"	"
Do., Bullnose	4 10 0	"	"
Best Stourbridge Fire Bricks	4 4 0	"	"
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers	13 0 0	"	"
Headers	12 0 0	"	"
Quoins, Bullnose, and Flats	17 0 0	"	"
Double Stretchers	19 0 0	"	"
Double Headers	16 0 0	"	"
One Side and two Ends	19 0 0	"	"
Two Sides and one End	20 0 0	"	"
Splays, Chamfered, Squints	20 0 0	"	"
Best Dipped Salt Glazed Stretchers and Headers	12 0	"	"
Quoins, Bullnose, and Flats	14 0 0	"	"
Double Stretchers	15 0 0	"	"
Double Headers	14 0 0	"	"
One Side and two Ends	15 0 0	"	"
Two Sides and one End	15 0 0	"	"
Splays, Chamfered, Squints	14 0 0	"	"
Seconds Quality White and Dipped Salt Glazed	2 0 0	"	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime	25 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.	
Bath "	1 7	"	"
Farleigh Down Bath	1 8	"	"
Beer in blocks	1 6½	"	"
Grinshill "	1 10	"	"
Brown Portland in blocks	2 2	"	"
Darley Dale in blocks	2 4	"	"
Red Corsehill "	2 5	"	"
Red Mansfield "	2 4	"	"
Hard York in blocks	2 10	"	"
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super at rly. depôt	
" " 6 in. Rubbed Ditto	3 0	"	"
" " 3 in. sawn both sides slabs (random sizes)	1 3	"	"
" " 2 in. self-faced Ditto	0 9½	"	"
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt	
" " " 6-in sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
" " " 3-in. do.	1 2½	"	"

PRICES CURRENT (*Continued*).

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep.	
" best seconds	10 15 0	"	"
16× 8 best "	6 8 6	"	"
20×10 best blue Portmadoc	10 18 0	"	"
16× 8 best blue Portmadoc	6 0 0	"	"
20×10 best Eureka unfading green	11 2 6	"	"
16× 8 " "	6 15 0	"	"
20×10 Permanent green	10 0 0	"	"
16× 8 " "	5 18 6	"	"

TILES.

	s. d.		
Best plain red roofing tiles	42 6	per 1,000 at rly. depôt	
Hip and valley tiles	3 7	per doz.	" "
Best Broseley tiles	48 6	per 1,000	" "
Hip and valley tiles	4 0	per doz.	" "
Best Ruabon Red, brown or brindled Do. (Edwards)	37 6	per 1,000	" "
Do. ornamental Do.	60 0	"	" "
Hip tiles	4 0	per doz.	" "
Valley tiles	3 9	"	" "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	" "
Hip tiles	4 1	per doz.	" "
Valley tiles	3 8	"	" "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
Fir timber: Best middling Dantzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 18 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
" " 3 in. by 9 in.	15 12 0	16 12 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	13 10 0	14 12 0
" " 3 in. by 9 in.	12 12 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 12 0	13 10 0
" " 3 in. by 9 in.	12 0 0	12 10 0
" " battens	9 10 0	10 10 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 12 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Dantzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
¾ in. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

Prepared Flooring—	Per square	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders " "	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Plitch Plates	8 10 0	9 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
" " galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Sheet Iron, galvanised, flat, best quality.— Ordinary sizes to 20 g.	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	13 5 0	- - -
Pipe in coils	13 15 0	- - -
Soil Pipe	16 5 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian "	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin "	0 1 1½	- - -
Copper nails "	0 1 1½	- - -
BRASS— Strong Sheet "	0 0 11	- - -
Thin "	0 1 1	- - -
TIN—English Ingots "	0 1 3	- - -
SOLDER—Plumbers' "	0 0 6½	- - -
Tinmen's "	0 0 8	- - -
Blowpipe "	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
" " fourths	2¾d. " "
21 oz. thirds	3¼d. " "
" " fourths	3¼d. " "
26 oz. thirds	4¼d. " "
" " fourths	4¼d. " "
32 oz. thirds	5¼d. " "
" " fourths	5¼d. " "
Flatted sheet, 15 oz.	3¼d. " "
" " 21 "	4¼d. " "
½ Hartley's Rolled Plate	2¾d. " "
⅓ " " "	3¼d. " "
¼ " " "	3¼d. " "

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes	0 2 10	per gallon
" " " in barrels	0 2 11	"
" " " in drums	0 3 11	"
Boiled " " in pipes	0 3 0	"
" " " in barrels	0 3 1	"
" " " in drums	0 3 3	"
Turpentine, in barrels	0 2 3	"
" in drums	0 2 6	"
Genuine Ground English White Lead	21 10 0	per ton
Red Lead, Dry	21 10 0	"
Best Linseed Oil Putty	0 8 6	per cwt.
Stockholm Tar	1 12 0	per barrel

VARNISHES, &c.

	per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

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TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

CONISBRO'.—For erecting Doncaster and Mexboro' isolation hospital, near Conisbro'. Mr. J. H. Morton, architect, South Shields:—

J. Woods	£17,544 6 7	G. H. Smith	£12,851 5 11
Green & Co.	14,201 15 8	J. G. Cooling	12,248 2 8
Walker & Slater	13,450 0 0	Denholm & Co.	12,107 10 9
Dennis Gill & Son	12,923 6 0	Arnold & Son	11,975 0 0
		M. Grantham	11,970 9 4

[Architect's estimate, £12,250.]

FRING (Norfolk).—For alterations and repairs to the Hall, and erection of new lodge, schoolhouse, and other buildings at Fring, Norfolk. Messrs. William Jarvis & Son, architects, Paradise Parade, King's Lynn:—

W. H. Brown	£1,098 0	Jonas Chilvers, Snettisham*	£799 10
Bardell Bros.	1,049 0	Hipwell & Co.	795 0
Chambers & Sons	946 10		
J. W. Collins	814 0		

New Lodge.

Bardell Bros.	£657 0 0	Matsell & Walden	£502 16 10
W. H. Brown	650 10 0	Jonas Chilvers, Snettisham*	487 7 0
J. W. Collins	542 10 0	Hipwell & Co.	451 10 0
Chambers & Sons	525 0 0		

Schoolhouse.

W. H. Brown	£540 0 0	Matsell & Walden	£404 12 9
Bardell Bros.	519 0 0	J. W. Collins	402 0 0
J. Chilvers, Snettisham*	415 0 0	Chambers & Sons	382 12 0
		Hipwell & Co.	350 0 0

Pair of Cottages at Fring.

Bardell Bros.	£645 0 0	Matsell & Walden	£517 9 10
W. H. Brown	640 0 0	Jonas Chilvers, Snettisham*	493 0 0
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